

THE EFFECT OF FULL-IMMERSION SCHOOLING ON NATIVELIKENESS AND  
DOMINANCE IN PALESTINIAN ARABIC-AMERICAN ENGLISH BILINGUALS

BY

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DISSERTATION

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## **ABSTRACT**

In second language acquisition, it is well known that an early age of onset and an extensive amount of naturalistic input are key elements promoting successful learning outcomes. What is less well known is what outcomes we can expect when the main source of these elements is full-immersion schooling, defined for the purposes of this study as a type of schooling wherein the medium of instruction is the students' L2 and the school provides additional elements favoring successful L2 acquisition, while the L1 is the predominant home and societal language. The main question driving this study was whether individuals I call school bilinguals, who have been schooled entirely or almost entirely in a full-immersion setting, achieve nativelike competence in the L2, defined as a level of competence equal to that of a prototypical native speaker of the L2, for whom that language was the predominant home, school, and societal language during childhood and adolescence.

Other questions of interest related to L1 competence, dominance, the societal language, and individual variation. The study sought to find out whether school bilinguals achieve nativelikeness in their L1 and whether they become dominant, in terms of proficiency, in one language or the other. The study also sought to tap into the role of the societal language by comparing school bilinguals with heritage speakers of the L1 who share the school bilinguals' L2, in other words, individuals whose linguistic background overlaps to a great extent with that of school bilinguals with the exception of the predominant societal language during childhood and adolescence. Finally, the study sought to find out whether school bilinguals exhibit individual variation in their nativelikeness outcomes, and, if so, whether language aptitude, language use and exposure, and/or socioaffective factors correlate with individual variation.

School bilinguals and heritage speakers with Palestinian Arabic as an L1 and American English as an L2 completed a language aptitude test and a linguistic questionnaire targeting language use and exposure and socioaffective factors. They also completed a battery of parallel tasks, in English and Arabic, designed to measure nativelikeness and dominance in terms of proficiency. An Elicited Imitation Task (EIT) in each language was administered to measure dominance in terms of proficiency, and a Truth Value Judgment Task (TVJT) and a Grammaticality Judgment Task (GJT) in each language were administered to measure nativelikeness. The TVJTs and GJTs targeted five linguistic areas in each language: article semantics, verbal aspect, resumptive pronouns, double objects, and adverb word order. These linguistic areas were selected because they exhibit important differences between the two languages and are thus particularly vulnerable to intrusive transfer. It was expected that nativelike performance in all five areas would be a strong indicator of nativelikeness. Native speakers of each language served as controls and completed the language aptitude test and the EIT, TVJT, and GJT in their respective native language.

Overall, the results suggested that the school bilinguals were nativelike in both languages, with balanced proficiency across the two languages, and that the heritage speakers were nativelike in English and not nativelike in Arabic, and dominant in English in terms of proficiency. Little individual variation was found within either of the two groups, and there were very few significant correlations between individual variation and language aptitude, language use and exposure, or socioaffective factors. While this suggests that when the home language is the L1 and the school language is the L2, it is more advantageous, in terms of ultimate attainment in the two languages, to have the L1, and not the L2, as the societal language, more research is needed in order to determine how generalizable these findings and conclusions are.

*To Everyone Who Is Not Prototypical*

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## **CHAPTER 1: INTRODUCTION**

### **1.1 INTRODUCTION**

What does it mean to be a native speaker? Who counts as one? For many people, the answers to these questions may seem obvious, although those people may be hard pressed to articulate their criteria. Some of the most common criteria that are invoked are for the language to be the language of the person's country of birth, for the person to have acquired that language from birth and spoken it during their formative years, and for the language to be the only language spoken by the speaker (Montrul, in press). Yet these criteria are oversimplified and barely scratch the surface of an extremely complex phenomenon. What about people who grow up with more than one language? What about people who acquire a language from birth but are heavily exposed to it only until a certain age in early childhood? What about people who lived in many different places growing up? While the vast majority of the world's population can speak or sign at least one language, it is not always readily clear which language, or languages, each person can be considered a native speaker of.

Indeed, bilingualism and multilingualism are widespread all over the world, and bilinguals and multilinguals exhibit a great diversity of bilingual and multilingual profiles, each with a host of important factors that impact their speakers' linguistic trajectories, not least in terms of their proficiency in each language. This, in turn, informs the ways in which one might answer the questions of who counts as a native speaker and what it takes for somebody's proficiency in a language to be considered native or nativelylike. Language plays a pivotal role in our world, as a crucial part of many people's identity, as a practical tool for communication and expression, and as an asset that can greatly impact many different types of opportunities a person

may have access to, such as employment. For these reasons and more, questions related to native proficiency and nativelikeness are well worth exploring. This dissertation aims to increase our understanding of this complex phenomenon.

This chapter gives an overview of the dissertation and discusses its key concepts: ultimate attainment, nativelikeness, dominance, early bilinguals, heritage speakers, full-immersion schooling, school bilinguals, and diglossia. Section 1.2 provides an overview of the dissertation, its goals, and its contributions. Section 1.3 discusses ultimate attainment and nativelikeness in second language acquisition, with a focus on factors affecting both, and Section 1.4 reviews previous studies on nativelikeness. Section 1.5 discusses nativelikeness and dominance in early bilinguals, with a focus on heritage speakers, full-immersion schooling, and the target population of the dissertation: school bilinguals. Section 1.5 also discusses two key features of the target population's linguistic background: their school and the concept of diglossia. Section 1.6 summarizes the chapter.

## 1.2 DISSERTATION OVERVIEW

In second language acquisition (SLA), a great deal of attention is paid to ultimate attainment, which is defined by Lardiere (2013) as “the outcome of grammatical development; that is, the state of knowledge actually attained at a stabilized endpoint of development in a particular domain” (p. 670). In other words, ultimate attainment in SLA is about L2 proficiency, i.e., linguistic ability and fluency in various domains of the L2 (Montrul, 2015, p. 16). To measure proficiency, SLA researchers typically use standardized or specifically developed linguistic tests, or observations of naturally occurring linguistic behavior (Montrul, 2015, pp. 18-20). The goal is to find out what levels of proficiency second-language learners can reach, and

what factors contribute to different levels of proficiency in specific grammatical areas and globally. These are perennial questions in SLA research that have yet to be fully answered.

SLA research often distinguishes between native speakers and non-native speakers of a language. The term *native speaker* can be ambiguous; perhaps a clearer label for speakers who are usually referred to as *native speakers* in SLA research is prototypical native speakers. For the purposes of this dissertation, a *prototypical native speaker* of a language is an individual who was exposed to that language from birth; heard only that language at home during their formative years as spoken by his or her parents, caregivers, or guardians (who were native speakers of that language); grew up in a community in which that language was the majority language; and was schooled only in that language. This definition is based on Abrahamsson and Hyltenstam (2009)'s operationalized definition of the notion "native speaker of Swedish": "someone who (a) has spoken only Swedish at home during childhood, (b) has had Swedish as the only language of instruction at school, and (c) has lived his or her whole life in a context in which Swedish has been the majority language" (p. 264). Similarly, a clearer label for speakers usually referred to as *non-native speakers* in SLA research is prototypical non-native speakers of a language. For the purposes of this dissertation, a *prototypical non-native speaker* of a language is an individual who speaks that language as a second language, having acquired it (very often in an instructed setting) after the structural foundations of the first language—which satisfies the above criteria (and can thus be considered that individual's native language)—were already in place.

In SLA, the upper end of the ultimate attainment scale is generally considered to be *nativelikeness*, a level of proficiency or competence that is equal to that of a prototypical native speaker of the L2. This is because prototypical native speakers of a language are generally considered to have attained the highest possible levels of proficiency in that language, and they

are looked to as models of complete and successful acquisition of the grammatical structural of the language. The question of how L2 learners' linguistic knowledge compares to that of prototypical native speakers is one that has interested many second-language learners and teachers (Canagarajah, 1999; Doerr, 2009). It is also an important theoretical question in SLA, as it taps into whether—and under what conditions, if any—maximal ultimate attainment is possible without all of the elements of a prototypical native speaker's linguistic background. Thus, investigating the extent to which an advanced learner's proficiency approximates that of a prototypical native speaker of the L2 has the potential to make a number of contributions of both theoretical and practical importance. In addition to expanding the academic body of knowledge in bilingualism and SLA, a fuller understanding of the factors leading to nativelikeness may have important practical implications both for language education and for employment decisions in fields that rest heavily on native or nativelike competence as a criterion—such as diplomacy, national security, and translation and interpreting.

L2 nativelikeness seems to be common among *heritage speakers* (Montrul, 2008). Heritage speakers are individuals, typically children of immigrants and immigrant children, who are exposed to a minority language in the home alongside a predominant societal language that is also their school language (Albirini & Chakrani, 2017). Heritage speakers' L2 acquisition environment provides many of the elements that research has repeatedly demonstrated to be important for successful L2 acquisition, so much so that they are often not only nativelike in their L2 but less than nativelike in their L1 or heritage language (Albirini, 2018a; Albirini & Benmamoun, 2014a, 2014b, 2015; Albirini et al., 2011; Arslan et al., 2017; Polinsky, 2011).

In *full-immersion schooling*, as defined for the purposes of this dissertation, children of non-immigrant parents are educated at a school whose medium of instruction is a single language



differing from the children's home language(s) and the societal language(s) and that additionally provides a number of crucial elements—such as the instructors' native languages, and the use of the language of instruction outside the classroom—favoring successful L2 acquisition and concomitantly hampering L1 acquisition. Since full-immersion schooling approximates the school environments of heritage speakers, it is worthwhile to investigate whether full-immersion schooling can similarly lead to L2 nativelikeness. For the purposes of this dissertation, individuals schooled at a full-immersion school in a non-local language in a setting that largely parallels one in which that language is a local language will be referred to as *school bilinguals*. Of course, a significant difference between heritage speakers and school bilinguals is that for heritage speakers, the L2 is not only the school language but also the societal language. This raises the question of whether full-immersion schooling can lead to levels of L2 (and/or L1) proficiency similar to those often reached by heritage speakers despite the difference in societal language.

In bilingualism, *dominance* refers to “the idea that one language of the bilingual will be used more often (in specific contexts) and will likely be processed more easily than the other” (Montrul, 2015, p. 15). For heritage speakers, the L2 is generally the dominant language, and again, an interesting question is whether this is the same for school bilinguals. In other words, we can look at where these groups of bilinguals lie on the ultimate attainment scale for each of their languages (nativelikeness), and we can also look at how their respective ultimate attainments in each language compare to each other (dominance). Nativelikeness and the factors leading to it are the primary focus of this dissertation, and dominance is a secondary focus.

In SLA, many ultimate attainment researchers focus on various groups sharing crucial SLA-relevant characteristics, without investigating *individual variation*, differences between

members of the same group (see Bayley & Langman, 2004 and Regan, 2004 for discussions of the practices of grouping learners and targeting individuals, and empirical evidence in support of the former). Because research consistently shows that individual variation is common (Bartning, 2016; Erman et al., 2016; Fant, 2016; Hyltenstam, 2016; McMillion & Shaw, 2016), another layer of ultimate attainment research investigates the factors responsible for individual variation between members of the same group. Individual variation is found among both L1 and L2 speakers, and the literature points to various factors that may account for it (Abrahamsson & Hyltenstam, 2008; Albirini, 2014; Albirini, 2018b; Birdsong, 2005; Bylund et al., 2009; Bylund et al., 2012; Dörnyei et al., 2004; Erman et al., 2016; Fant, 2016; Granena, 2014; Hyltenstam, 2016; McMillion & Shaw, 2016; Montrul, 2011a; Takahashi, 2001).

This dissertation investigates the relationship between full-immersion schooling, nativelikeness, and bilingual dominance by studying a population of L1-Arabic L2-English school bilinguals who received the majority of their schooling at a full-immersion school maximally favoring successful L2 acquisition and potentially hampering L1 acquisition. A study was conducted to test these school bilinguals in a number of areas of their L1 and L2 and compare them to Arabic heritage speakers with English as an L2, i.e., individuals with a very similar linguistic background with the exception of the societal language. The study sought to find out 1) whether school bilinguals can be nativelike in their L2 and/or less than nativelike in their L1; 2) whether school bilinguals can be dominant in their L2; 3) how school bilinguals compare to heritage speakers with regard to nativelikeness and dominance; 4) whether school bilinguals exhibit individual variation in terms of nativelikeness; and 5) if so, whether certain factors can account for the individual variation. This dissertation makes at least four important contributions to the fields of SLA and bilingualism: 1) it investigates a relatively understudied

population of bilinguals—school bilinguals; 2) it focuses on bilinguals’ proficiency in *both* of their languages (English and Arabic); 3) it targets a range of different skills, as opposed to just one linguistic skill or domain; and 4) it contributes to the research on the acquisition of Arabic, a significantly understudied language compared to English. Additionally, the findings of this dissertation stand to help inform decisions related to language education and employment in positions requiring native or nativelike levels of language proficiency.

### 1.3 ADVANCED ULTIMATE ATTAINMENT AND NATIVELIKENESS IN SECOND LANGUAGE ACQUISITION

Studying ultimate attainment is no simple matter. Not only do L2 learners differ dramatically from each other in terms of their linguistic backgrounds and language acquisition profiles, but even categorizing them according to proficiency is not straightforward (Bartning, 2009).

The very broad categories of *beginner*, *intermediate*, and *advanced* often prove insufficient or misleading, as the learners grouped within each of these categories often exhibit significant within-group differences that warrant further subdivisions. This is particularly the case when it comes to advanced learners or advanced L2 speakers, who differ from each other in important ways with respect to the extent to which their L2 proficiency resembles that of prototypical native speakers of the L2. Thus, it is important to avoid painting all advanced L2 learners with a broad brushstroke and instead seek to categorize them in a more nuanced way that addresses aspects of their linguistic proficiency that are crucial for an accurate assessment of their ultimate attainment.

Hyltenstam (2016) makes a contribution towards such a nuanced categorization by distinguishing between three groups of advanced L2 learners, based on proficiency:

(1) ‘nativelike L2 proficiency’, i.e. proficiency levels among L2 users who are, in fact, equal to those of native speakers; (2) ‘near-native L2 proficiency’, i.e. a level that is close to but not exactly nativelike (L2 speakers at this level are not easy to distinguish from native L1 speakers in everyday oral communication, but differences may be more salient when speakers are faced with demanding linguistic tasks (Hyltenstam & Abrahamsson, 2003)); and (3) non-native L2 proficiency, i.e. proficiency levels among speakers who are clearly identified as non-natives in everyday oral communication although being at an advanced level of L2 proficiency. (p. 5)

This three-way distinction is useful because it highlights crucial differences between three groups of L2 speakers who can all be rightfully labeled “advanced,” by offering a layer of analytic depth and granularity that is usually absent from descriptions that group all advanced learners into a single category. In the 2012 edition of the American Council on the Teaching of Foreign Language (ACTFL)’s Proficiency Guidelines (American Council on the Teaching of Foreign Languages, 2012), advanced L2 learners are described in fairly general terms: advanced speakers are said to have “sufficient control of basic structures and generic vocabulary to be understood by native speakers of the language” (p. 5); advanced writers are said to “show good control of the most frequently used structures and generic vocabulary” (p. 12); advanced listeners are said to “demonstrate the ability to comprehend language on a range of topics of general interest” (p. 17); and advanced readers are said to “have sufficient control of standard linguistic conventions to understand sequencing, time frames, and chronology” (p. 22). In apparent recognition of the need for more fine-grained categories, the ACTFL divides advanced L2 learners into three subdivisions: High, Mid, and Low (p. 3).

Simply distinguishing between L2 learners who are advanced and those who are not occludes subtle yet significant within-group differences among advanced learners. According to the above breakdown, some L2 learners are *nativelike*, having achieved what is considered to be the highest possible level of L2 proficiency; others are *near-native*, having achieved an extraordinarily high level of L2 proficiency that nevertheless falls short of nativelike proficiency; and still others, although advanced, have *non-native* proficiency, which is not advanced enough to be considered near-native. All three of these categories (“nativelike,” “near-native,” and “advanced non-native”) refer to an L2 learner’s ultimate attainment. In other words, the term *ultimate attainment* itself does not indicate any particular level of proficiency: it is the level at which a learner’s interlanguage system has stabilized and beyond which the learner does not gain further proficiency.

I will now present some background on the concept of nativelikeness and how it has been measured in the research on L2 acquisition and bilingualism.

### 1.3.1 Factors Affecting Ultimate Attainment and Nativelikeness in Second Language Acquisition

In the SLA and bilingualism literature, the broad consensus is that many different factors impact ultimate attainment. Some of the many factors cited in the literature as affecting ultimate attainment in an L2 are learner-external, while others are learner-internal.

Perhaps the two most important *learner-external factors* are type and amount of input (discussed below). Another is linguistically relevant social attitudes faced by the learner, such as expectations of non-targetlike behavior (Fant, 2016). L1/L2 pairings (Birdsong, 2005) are also important: the L2 learner’s L1 has been shown to affect acquisition of the L2, and the degree of similarity or distance between the L1 and the L2 matters. In their replication of Johnson and Newport’s (1989) study on maturational constraints on the acquisition of L2 English, Birdsong

and Molis (2001) used the exact same methods and materials as Johnson and Newport but tested L1 Spanish speakers instead of L1 Chinese and L1 Korean speakers as in Johnson and Newport's study. Birdsong and Molis found that the L1 Spanish participants in their study outperformed those in Johnson and Newport's, whose L1s were Chinese and Korean. This finding is likely due at least in part to the closer linguistic proximity between English and Spanish than between English and either Chinese or Korean.

Thus, even in the same language learning environment (i.e., in one with the same language-external factors), L2 learners exhibit a great deal of individual variation, due to a number of other factors. The existence of individual variation among learners is widely recognized in the literature (Bartning, 2016; Erman et al., 2016; Fant, 2016; Hyltenstam, 2016; McMillion & Shaw, 2016), and herein lies the importance of *language-internal factors*. Among the most important ones are age of onset and language aptitude (discussed below). Others include social identity (Fant, 2016), cultural background (Erman et al., 2016; McMillion & Shaw, 2016), self-image (Fant, 2016), motivation (Erman et al., 2016; Takahashi, 2001), attitude (Birdsong, 2005; Erman et al., 2016), and linguistically relevant behaviors, such as interaction with native speakers (Birdsong, 2005) and active involvement in an L2-speaking community (Dörnyei et al., 2004).

The ultimate attainment outcomes we can expect to see in an L2 learner depend on the specific combination of learner-external and learner-internal factors present. The more factors favoring successful acquisition, the more advanced we can expect an L2 learner's ultimate attainment to be. As Hyltenstam (2016) states, advanced levels of L2 proficiency are only attained "in some situations" (p. 1). *Nativelike* proficiency—which is considered the highest possible level of L2 proficiency—is particularly rare (Lardiere, 2013; Sorace, 2013); Bardel

(2016) even claims that “nativelike L2 users are yet to be found” (p. 75). We can assume, then, that nativelikeness requires a particularly advantageous combination of factors favoring successful acquisition.

### 1.3.2 Type and Amount of Input

*Type of input* is important. Naturalistic exposure, as opposed to instructed learning, seems to be a factor favoring successful long-term ultimate attainment in SLA. Hyltenstam (2016), for example, notes that even near-native L2 speakers who pass for native speakers and have lived for many years in a country in which the L2 is the dominant language differ “slightly but significantly” (p. 8) from native speakers and that in many cases, the learners had learned the language in an instructed setting before being exposed to it in a natural setting.

Whether learning is implicit or explicit is recognized as an important factor in SLA (Bartning, 2016; DeKeyser, 2013). In implicit learning, the learner acquires knowledge without any explicit references to or explanations or descriptions of a target structure or skill; the learner is not conscious of the target structure or skill, makes no targeted effort to learn it, and may not necessarily be able to articulate its features or explain how it was acquired. In explicit learning, in contrast, the target structure or skill is explicitly named, described, and explained; the learner is conscious of it, makes a targeted effort to learn it, and can later describe its features and explain how it was acquired. Because implicit L2 learning approximates L1 learning (M. Paradis, 2004), it is likely to favor more successful learning outcomes than explicit learning.

Another important aspect of type of input is whether learning takes place in an immersion or a non-immersion setting. Howard (2009) showed some benefits to study abroad, one type of immersion setting, and DeKeyser (2013) describes immersion as necessary for children to “capitalize on their implicit learning skills” (p. 335). Foster et al. (2014) looked at the influence

of exposure, memory, age of onset, and motivation in both immersion and non-immersion settings on nativelike knowledge of formulaic language and found that the only combination that guaranteed nativelikeness was an early age of onset and an immersion setting.

*Amount of input* is also important. In discussing formulaic language, Erman et al. (2016) state that “it is reasonable to assume that L2 speakers need to get a huge amount of authentic input to perceive and acquire [conventional] combinations” (p. 127), and they also mention length of stay in an L2-dominant environment as an important factor.

### 1.3.3 Age of Onset and Language Aptitude

Age of onset, the age at which acquisition of a second language begins, is widely recognized as a crucial factor affecting language acquisition and ultimate attainment (Hyltenstam, 2016). Age of onset has crucial implications for the Critical Period Hypothesis, which proposes a critical period, extending from early infancy until puberty, during which a first language can be fully acquired (Lenneberg, 1967). Proponents of the Critical Period Hypothesis postulate that it is impossible (or very difficult) to fully acquire a language after a certain age. For first-language acquisition, the consensus is that a critical period does in fact exist, because brain maturation and linguistic development take place simultaneously (Mayberry & Kluender, 2018). For SLA, the existence of a critical period is still heavily debated (see commentaries on Mayberry & Kluender, 2018), although empirical findings generally suggest age effects. In any case, early AOs have been repeatedly shown to correlate with higher proficiency; in fact, studies suggest that age of onset plays a far more significant role than other factors (Hyltenstam, 2016, p. 8).

With regard to age of onset, bilinguals are generally grouped into two broad categories: early bilinguals and late bilinguals (Alarcón, 2011; Foote, 2011; Gathercole & Moawad, 2010;



Grossi et al., 2010; Ortiz-Mantilla et al., 2010). Although there is not a universally accepted cutoff age used by all researchers to separate early bilinguals from late bilinguals, it is generally accepted that anyone who acquires a second language in early childhood is an early bilingual (in other words, the cutoff age is typically assumed to be twelve or thirteen). Late bilinguals, in contrast, begin acquisition of a second language or become bilingual around or after puberty. Early bilinguals can be further subdivided based on language acquisition environment (L2 learners for whom the L1 is a heritage language and those for whom it is not<sup>1</sup>) (Montrul, 2008) and age of onset (simultaneous bilinguals vs. sequential bilinguals, who can be early child L2 learners or older child L2 learners) (Meisel, 2013). Montrul (2008) proposes that the age of onset is generally between birth and the age of 3 for simultaneous bilinguals, between the ages of 4 and 6 for early child learners, between the ages of 7 and 12 for late child learners, and post-puberty and in adulthood for late learners. For a more detailed discussion of early bilinguals, see Section 1.5.

DeKeyser (2000) links age of onset and the Critical Period Hypothesis with implicit and explicit learning by arguing that early learners outperform late learners in terms of ultimate attainment because many aspects and rules of a language must be learned implicitly and that by puberty, children will have lost the ability to successfully learn a language through implicit mechanisms only. That said, an early age of onset alone does not guarantee successful L2 acquisition, and individual variation, with effects that are relevant to ultimate attainment, exists even among learners from the same age group (Hyltenstam, 2016), so age of onset does not tell the full story. With regard to nativelikeness, Nishikawa (2014) observes that on its own, an early age of onset does not guarantee nativelikeness even under the most optimal learning

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<sup>1</sup> Learners in each of these groups can be either simultaneous or sequential bilinguals.

circumstances, suggesting that other factors are necessary. Thus, an early age of onset seems to be necessary but not sufficient for nativelikeness.

Language aptitude is defined by Abrahamsson and Hyltenstam (2008) as “a largely innate, relatively fixed talent for learning languages” (p. 485). Language aptitude seems to be important even for early learners (Abrahamsson & Hyltenstam, 2008). In early bilinguals, language aptitude has been shown to correlate positively with nativelikeness in both the L1 and the L2 (Bylund et al., 2012); to be favorable in countering first-language attrition (Bylund et al., 2009); and to correlate positively with performance on untimed Grammaticality Judgment Tasks (GJTs) (Granena, 2014). In Abrahamsson and Hyltenstam (2008)’s study, early learners who passed for natives but did not perform at a nativelike level had lower language aptitude. Among the *late* learners in the study, language aptitude correlated positively with passing for a native (near-nativeness), but the majority of the participants were not nativelike, so the authors conclude that language aptitude is necessary for near-nativeness but not sufficient for nativelikeness and that the results do not necessarily disprove the Critical Period Hypothesis since language aptitude compensates for maturational constraints. Birdsong (2005) also refers to the importance of language aptitude in explaining successful L2 acquisition past a critical age. What all of this suggests is that language aptitude may be one of the factors accounting for the fact that not all early learners are nativelike; in other words, if age of onset does not tell the full story, language aptitude may be one of the missing pieces of the puzzle that we need to consider if we want to understand what combination of factors leads to nativelikeness.

#### 1.3.4 Conclusion

Several factors relevant to ultimate attainment were discussed above. Since nativelikeness is rare, and many if not all of those factors are not sufficient—although they may

be necessary—for successful or advanced ultimate attainment, we can hypothesize that not just one but *several* of the learner-external and learner-internal conditions summarized in Table 1 are probably necessary for nativelikeness.

**Table 1:** Factors Favoring Nativelikeness

Learner-External	Learner-Internal
<b>naturalistic exposure and/or implicit learning</b>	<b>an early age of onset</b>
<b>a large amount of input</b>	<b>high language aptitude</b>
L1/L2 pairings favoring acquisition	social, cultural, personal, attitudinal, and behavioral factors favoring acquisition
external social attitudes favoring acquisition	
Factors in bold are particularly important.	

#### 1.4 PREVIOUS STUDIES ON NATIVELIKENESS

A number of previous studies have shown that some L2 learners, even late learners, can achieve nativelikeness in *certain domains*; examples include the studies by Donaldson (2011) on right dislocation in French; Ioup et al. (1994) on speech production, accent identification, and grammatical intuitions in Egyptian Arabic; Montrul and Slabakova (2003) on the preterite-imperfect contrast in Spanish; Reichle (2010) on judgment of information structure in French; White and Genesee (1996) on grammaticality judgment and question formation in English; Bongaerts (1999) on pronunciation in English and French; Bongaerts et al. (2000) on pronunciation in Dutch; Moyer (1999) on pronunciation in German; Birdsong (2003) on pronunciation in French; Birdsong (1992) on syntax and semantics in French; and Hermas (2014) on verb movement and the null subject parameter in English. Cases of nativelike performance among late learners have been interpreted as evidence against the Critical Period Hypothesis (Birdsong, 2003). These studies—especially the ones on pronunciation—support the important idea that there is no *single domain* in which nativelikeness is entirely unattainable (Birdsong, 2005).

Fewer studies have investigated nativelikeness across a number of different domains in the same individuals. One such study was conducted by Abrahamsson and Hyltenstam (2009),

who investigated the Swedish competence of heritage speakers of Spanish living in Sweden; the participants included both early and late learners. The study tested a broad range of linguistic skills and employed about twenty different instruments, and the results of 10 of those instruments were analyzed in the article. Speech production and perception were tested by means of a VOT production task, a VOT perception task, and two tasks designed to measure the accuracy of speech perception against babble noise and white noise, respectively. Advanced morphosyntactic skills were tested by means of a cloze test, a written grammaticality judgment task, and an auditory grammaticality judgment task, for which two measures were taken: accuracy and reaction times. As a rare occurrence among L2 learners, even those with advanced proficiency, knowledge of formulaic language was tested by means of two oral elicited production tasks, one measuring knowledge of idioms and another measuring knowledge of proverbs. In both tasks, participants had to complete the idioms and proverbs by supplying missing words. Out of 41 L2 participants, only two or three (4.9% or 7.3%)<sup>2</sup> had nativelike performance on all 10 measures whose results were analyzed in the article, and there was a negative correlation between nativelike performance and age of onset; none of the late learners in the study had nativelike performance on all 10 measures. Similar results were found by Nishikawa (2014), who tested the comprehension and production of simple and complex Japanese relative clauses among near-native speakers of Japanese. Marinova-Todd (2003) employed eight instruments to measure pronunciation, vocabulary size, grammar, and language use among a group of late learners of English and found that out of 30 L2 participants, only two (6.7%) had nativelike performance on all eight measures.

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<sup>2</sup> Due to technical problems, one participant's data were incomplete.

The fact that nativelikeness was only found among a very small number of participants supports the prevalent observation that achieving overall L2 nativelikeness is rare (Selinker, 1972). Nevertheless, the fact that some participants were in fact nativelike is important—especially since some were even late learners—and invites further inquiry into the combination of factors that favor nativelikeness.

### 1.5 EARLY BILINGUALS: NATIVELIKENESS AND DOMINANCE

The term *simultaneous bilinguals* is generally used to describe individuals who were heavily exposed to two languages simultaneously before the age of about three (MacLeod & Stoel-Gammon, 2005, J. Paradis et al., 2003, Schaerlaekens et al., 1995), while *sequential bilinguals* are those that do not start acquiring a second language until after the age of three. Heritage speakers can be simultaneous or sequential bilinguals, depending on their age of onset for each language (Montrul, 2008; Rothman, 2009; Valdés, 2000). For heritage speakers, the L2 typically ends up being their dominant language, while their proficiency in their heritage language (the home language) varies depending on many factors.

Early bilinguals are particularly well suited to research on ultimate attainment and nativelikeness because they meet the crucial early age of onset criterion. Nativelikeness among simultaneous bilinguals and heritage speakers is an interesting area of study insofar as these two groups differ from the prototypical “native-speaker” and “non-native speaker” profiles that much of the SLA literature focuses on. While focusing on such cases is informative and enlightening, it ignores many language speakers whose linguistic backgrounds are more complex.

Some real-world examples of such cases are the following: **Speaker A**’s father’s native language is Arabic, and her mother’s native language is Finnish. She grew up in an Arabic-speaking community but attended an American school where all instruction was in English

(almost exclusively by native speakers of English). As a child, she spoke Arabic and Finnish at home. **Speaker B**'s father's native language is English, and her mother's native language is French. She grew up in the US and Senegal and attended an English-medium school while in Senegal. The language of the Senegalese community was Wolof. **Speaker C**'s parents are both native speakers of Arabic. He grew up in an Arabic-speaking community in Israel but attended a Hebrew-medium school where all instruction was in Hebrew and over 95% of the students were native speakers of Hebrew. Hebrew is also the most widespread language in Israel outside Arabic-speaking communities.

In prototypical cases, it can generally be assumed that as a result of incomplete acquisition of some grammatical features of an L2, a non-native speaker of that language will not have fully targetlike grammatical competence in that language (i.e., he or she will not pattern like prototypical native speakers of the language, who have completed the acquisition process in all areas of grammar). In less straightforward cases such as those described above, the grammatical competence of the individuals in question (who speak at least two languages) is not always generalizable based on their linguistic profiles. Investigating the degree to which these individuals exhibit *nativelikeness* in the different languages they speak is one way to begin to better understand the intricacies of such linguistically “atypical” situations (such as those of simultaneous bilinguals and heritage speakers).

Another interesting aspect of early bilinguals' linguistic profiles is *dominance*. Grosjean (1989) made the point that the bilingual is not two monolinguals in one person (p. 4), and Birdsong (2005) has stressed that “it is impossible for either the L1 or the L2 of the bilingual to be identical in all respects to the language of a monolingual” (p. 323), due to “inevitable interactions, with functional repercussions, of the L1 on the L2, and of the L2 on the L1” (p.

320). One reason for this is that, as explained by Daller et al. (2010), the two languages of a bilingual are typically used in different domains and with different frequencies, and bilingual children are typically more exposed to one language than the other. It is generally accepted that “balanced bilingualism” is rare or nonexistent (Grosjean, 2008) and that in the vast majority of cases one of a bilingual’s two languages will be dominant.

Dominance is a multidimensional concept covering many different linguistic features (Birdsong, 2015), one of which is proficiency (Montrul, 2015). In other words, a bilingual is usually more proficient in one language than in the other, and this is independent of nativelikeness. Whether or not a bilingual is nativelike in both languages, in only one language, or in neither, they can be, and usually are, dominant in one language with regard to proficiency. Dominance in the area of proficiency tells us which of the two languages is *closer* to being nativelike, whether or not each language actually is nativelike, individually. When we look at dominance, we are comparing a bilingual’s two languages *to each other*, as opposed to comparing each language *to some external standard* such as prototypical native proficiency.

#### 1.5.1 Bilingualism through Education

Individual cases of bilingualism differ with regard to the degree of agency exercised by individuals involved in a bilingual’s life (in most cases parents, guardians, or caregivers). Bilingualism can arise by necessity, or it can be a result of conscious choices made by parents or others who can influence an individual’s linguistic trajectory. One common parental choice that impacts children linguistically (specifically with regard to bilingualism) is the choice of a school for their children.

For example, some immigrant parents choose to educate their children at traditional monolingual schools, with the predominant societal language as the medium of instruction,



thereby leading to functional monolingualism as a result of language attrition, as discussed by Montrul (2008). Other immigrant parents, like those discussed by Shannon and Milian (2002), choose bilingual education for their children, a model that could potentially lead to biliteracy and high proficiency in two languages.

As a common choice for parents making education-related decisions that impact their children's bilingualism, bilingual education—with “dual language” or “two-way immersion programs” constituting “the most ‘bilingual’” of all programs, according to Shannon and Milian (2002, p. 683)—has been investigated from a variety of perspectives in a number of studies (Block, 2012; Gerena, 2011; Lindholm-Leary, 2012; Malone & Paraide, 2011; Relaño Pastor, 2008; Valiente Catter, 2011). As contrasted with traditional monolingual education, bilingual education is a model of education that uses two different languages as mediums of instruction within the same educational setting. This model is used, for example, in countries with more than one widespread language (such as Belgium, Canada, Israel, or Switzerland) and (less commonly) in countries with indigenous or aboriginal languages that are spoken alongside other languages with colonial origins (such as many countries in Latin America, Australia, and other parts of Oceania). It is also used in countries with regions in which a minority language is widespread due to a significant immigrant presence, a notable example being Spanish in certain regions of the United States.

### 1.5.2 Full-Immersion Schooling and School Bilinguals

A less common scenario is immersion schooling in an L2. In most cases, the medium of instruction at such schools, which are sometimes called *international schools* (cf. Hayden & Thomson, 1995), is English, although French-medium schools in non-French-speaking areas (such as Canada's English-speaking provinces) are fairly widespread as well. The predominance

of English as a non-local medium of instruction is unsurprising, given the prestige English enjoys in many countries (cf. Berg et al., 2001; El-Dash & Busnardo, 2001) and the recognized role of English as a “global language” (cf. Crystal, 1997; Demont-Heinrich, 2010; Gil 2011; Kushner, 2003; Pan & Block, 2011). Individuals who attend schools of this type become bilingual in their L1 and the school language.

Although many international schools have one thing in common—namely, the fact that the medium of instruction is not the societal language and not the L1 of most of the students—they exhibit a great deal of variability when it comes to their specific academic, social, and environmental characteristics (cf. Hayden and Thomson’s, 1995, description of international schools).<sup>3</sup> There are differences in important aspects such as the curriculum, the linguistic background of the instructors, and the pervading cultural environment at these schools. In some of these schools, the ones I refer to as *full-immersion schools* (as opposed to simply *immersion schools* or *international schools*) most or all of these important characteristics are very similar to those of schools in which the language used is also the widespread societal language. For example, in addition to using English as the medium of instruction, an English-medium school in Saudi Arabia may be very similar in other SLA-relevant ways to a prototypical (English-medium) school in the United States. For example, all the teachers may be native speakers of English, and English may be the only language used both inside and outside the classroom—two features that are not always present at international schools with English as the medium of instruction. The experience of Saudi students at that school can be very similar to that of Saudi heritage speakers growing up in the United States. Due to both the type and amount of L2 input

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<sup>3</sup> In some schools that use the label *international school*, instruction in the non-local language is restricted to certain grade levels only (for example, high school). In this discussion, these schools are not included within the category of *full-immersion schools*.

at such a school, it is likely to yield higher L2 proficiency levels than other types of English-medium schools where the type and/or amount of input are less conducive to L2 nativelikeness.

What this means is that, like heritage speakers, students at such schools (school bilinguals) could conceivably achieve L2 nativelikeness or even undergo attrition of the L1 (the home and societal language). Like heritage speakers, they could potentially experience a number of different linguistic outcomes constituting their ultimate attainment: they could have nativelike competence in both languages; they could experience a reversal in language dominance and end up being dominant in their L2; or they could experience L1 attrition, leading to L1 competence that does not fall within the range of prototypical native speakers of that language.

School bilinguals are early bilinguals whose first exposure to their L2 occurs around the start of schooling, which takes place in a full-immersion setting with the L2 as the medium of instruction, while the L1 continues to be the primary home and societal language. School bilinguals are first exposed to their L2 at school in early childhood and continue to be heavily exposed to the L2 on a regular basis at school, and to the L1 at home and in the broader community, for the majority of their childhood and adolescence. School bilinguals receive the vast majority of their schooling at the same school. Until they enroll at the school, they speak one language at home and in the society in which they live (although most of their L1 exposure occurs at home, since children at that age are not likely to have much interaction with members of their society outside their home unless they are sent to a daycare or something of that nature).

School bilinguals' initial exposure to their L2 coincides with the start of their schooling, which is entirely or almost entirely conducted in that L2. As the medium of instruction, the L2 is not taught to them explicitly; rather, they acquire it naturalistically by being fully immersed in it at school, where it is the medium of instruction. Throughout their childhood and adolescence,

school bilinguals continue to use and be exposed to their L2 at least while at school (and probably in other social contexts as well, such as conversing with peers from their school, for example), and their L1 at home and in society (although the extent of both L1 and L2 use outside the home will differ across individuals).

Heritage speakers and school bilinguals with the same L1/L2 pairing typically have the same home language (the L1) and the same school language (the L2), so the primary difference between their respective linguistic profiles is the societal language, which is the L1 in the case of school bilinguals and the L2 in the case of heritage speakers. Given this similarity, there is no compelling reason to reject the possibility that school bilinguals could exhibit the same type of linguistic variability observed among heritage speakers (and, incidentally, simultaneous bilinguals as well): while some members of the group are clearly non-native in their L2, others are nativelylike.

Furthermore, at least some school bilinguals could exhibit the type of “reversal” observed among many heritage speakers: “this type of language acquisition is characterized by normal exposure to the parental...language in the first few years of life, followed by an abrupt shift to the majority language when formal schooling begins” (O’Grady et al, 2011), and “even when the parents may speak the family language at home with each other and with the children, a very common pattern in these...households is that the children speak [the other language] to the parents and their siblings; they do not often use [the home] language with other children who speak the same... language” (Montrul, 2011a). Reversals of this type could indicate L1 attrition (cf. Montrul, 2008). While anecdotal support for the above conjectures is abundant, it is important to test them scientifically. This dissertation aims to make a contribution towards this goal by investigating the language proficiency of a population of school bilinguals.

To my knowledge, prior studies on immersion schooling have not investigated nativelikeness. Biswas et al. (2018) compared the quality of life among students at a Bengali-medium school and an English-medium school in Siliguri, India, and found that students at the Bengali-medium school reported increased quality of life compared to their counterparts at the English-medium school. Other studies have looked at immersion schooling in English with regard to English proficiency and preparedness for university studies in English, but not with regard to nativelikeness in English. Evans and Morrison (2017) found that English-medium schooling in Hong Kong led to higher English proficiency and better preparedness for university studies in English than did Chinese-medium schooling, while Kuchah (2018) found that increased English proficiency was not necessarily guaranteed by English-medium schooling in Francophone Cameroon. Maalim (2017) looked at students in Zanzibar who had received their primary education in Kiswahili and were then taught biology as a secondary school subject in either Kiswahili or English, and found that the students who were taught biology in Kiswahili performed better than those who were taught the subject in English.

Other aspects of immersion schooling investigated in the literature include attitudes and social dimensions (Abdul Manan et al., 2017; Normark, 2013; Solloway, 2018; Soysev et al., 2018), economic dimensions (Akhtar Mousumi & Kusakabe, 2017), literacy outcomes (Parsons & Lyddy, 2016), issues from teachers' perspectives (Walker & Tedick, 2000; Wedikkarage, 2018), perceived advantages and issues of equality (Kuchah, 2016; Kuchah, 2018), correlations between an English-only policy and the reporting of bullying (Lehman, 2017), and motivations and implementation (Paulsrud, 2014).

A few studies have looked at immersion instruction at the university level; among the aspects that have been investigated in that context are training and accreditation (O'Dowd,

2018), ideologies and identity issues (Dafouz, 2018), and students' preparedness for immersion instruction (Pritasari et al., 2019).

In a study that is relevant to the impact of L2 immersion on language dominance, Stadt et al. (2016) compared two groups of L1-Dutch secondary school students, each schooled using a different curriculum: a regular Dutch-medium curriculum and a partial-immersion curriculum where at least 50% of the subjects were taught in English. The study looked at the two groups' acquisition of French as an L3, and found that the immersion group demonstrated a greater L2 impact than L1 impact on their L3 French, and that the non-immersion group demonstrated a much greater L1 impact than did the immersion group. This suggests that even partial L2 immersion later than childhood can begin to shift dominance from the L1 to the L2 in certain areas.

### 1.5.3 Heritage Speakers: A Closer Look

Albirini and Chakrani (2017) provide a comprehensive working definition of heritage speakers:

Heritage speakers are children of immigrants who live in communities where their first language is not the dominant language. They are typically exposed to their parents' heritage language at an early age, mainly in the home, but eventually become more reliant on the dominant language as they get older. Because the dominant language is used in almost all social spheres and formal institutions, its use is necessary for heritage speakers to become functional members of their societies. Heritage speakers gradually develop native competencies in the dominant language, but do not usually have full command of the heritage language, due to limited input and opportunities for use (Montrul, 2008). Apart from limitations in heritage language exposure and use, heritage

speakers do not usually live in speech communities or “communities of practice” where they are likely to encounter the appropriate use of the heritage language for different topics, in different social settings, and with different interlocutors. (p. 318)

This definition highlights some important similarities and differences between heritage speakers and school bilinguals. Like heritage speakers, school bilinguals may become more reliant on the L2 as they grow older. This reliance may not be as strong as with heritage speakers, who, unlike school bilinguals, have the L2 as the dominant societal language. That said, although for school bilinguals L2 proficiency is not necessary to function in society, it is of course necessary for successful functioning in school. Thus, the need for L2 proficiency may not be materially greater for heritage speakers despite the fact that their need for it extends beyond the school environment. Like heritage speakers, school bilinguals may become L2-dominant, although the difference in dominance between the L1 and L2 may not be as pronounced as it is for heritage speakers. This is because school bilinguals have more L1 input, use the L1 more, and have access to communities of practice in the L1.

Heritage speakers are sometimes broadly analyzed as a group with characteristic features; for example, O’Grady et al. (2011) present a single model explaining the successes and failures of heritage speaker acquisition, and Soltan (2013) looks at “heritage language grammars” and their implications for linguistic theory. In reality, heritage speakers exhibit significant individual variation in terms of their language proficiency, most notably in their L1 (i.e., their heritage language) (cf. Montrul, 2011a). As Montrul (2011a) indicates, “broad definitions may consider anybody with a distant cultural and affective connection to a language minority group to be a heritage speaker, even if the person has no proficiency in the language; in contrast, narrower definitions may be as restrictive as to include only highly proficient users of the minority

language” (p. 156). If a broad definition is adopted, individual variation will inevitably be significant, but even the narrowest of definitions is unlikely to eliminate individual variation completely.

According to Montrul (2016), who highlights the fact that heritage speakers exhibit a broad range of proficiency in their heritage language (see also Polinsky, 2018), optimal input and use of the heritage language in favorable sociolinguistic environments are important for successful heritage language acquisition. Supporting this, Khamis-Dakwar et al. (2019) found in a study on child acquisition of Palestinian Arabic as a heritage language that parental education and home exposure to Palestinian Arabic correlated with children’s performance on irregular pluralization. Age of exposure to the L2 has also been found to be an important factor affecting L1 performance among heritage speakers (Albirini, 2018b).

In a study on variability in the language proficiency of Arabic heritage speakers, Albirini (2014) found that variability was due to language use as well as socioaffective factors such as “commitment to Arabic as a main marker of their heritage and identity, the encouragement of ... families to maintain their heritage language, and ... wider social networks” (p. 730). Similarly, in his sociolinguistic profile of Arabic heritage speakers in the United States, Albirini (2018a) cites some socioaffective factors that have an effect on heritage speakers’ motivation to acquire, use, and maintain a language. These include positive and negative attitudes toward the heritage language, the link between language and ethnic or cultural identity, and the valuing of the L2 as a marker of membership in society and a ticket to participation in the broader community.

Heritage speakers are often L2-dominant, demonstrating gaps in their L1 compared to their L2 in comparable areas (Albirini & Benmamoun, 2014a; Albirini et al., 2011) and L2 transfer in their L1 (Albirini et al., 2011). In various areas of their L1, heritage speakers often



underperform prototypical native speakers of the L1. This has been found to be the case, for example, with sentential negation in Egyptian Arabic (Albirini & Benmamoun, 2015), grammatical evidentiality and time reference in Turkish (Arslan et al., 2017), and relative clauses in Russian (Polinsky, 2011). Heritage speakers have been found to undergo a shift in dominance from the L1 to the L2 (Montrul, 2016) and L1 attrition (Polinsky, 2011), particularly in vocabulary, inflectional morphology, and complex syntactic structures (Albirini, 2018a).

Heritage speakers have been found to pattern like L2 learners of the heritage language in some ways while differing from them in others. In a study on anaphora resolution in Spanish, Keating et al. (2011) presented prototypical native Spanish speakers, heritage speakers of Spanish, and L2 learners of Spanish with syntactically ambiguous Spanish sentences such as *Juan vio a Carlos mientras Ø/él caminaba en la playa*, “John saw Charles while Ø/he was walking on the beach,” in which the null pronoun (Ø) or the overt pronoun (*él*, “he”) could refer to either the subject (*Juan*, “John”) or the object (*Carlos*, “Charles”) of the main clause. Participants were tested on their interpretation of these sentences and their sensitivity to pragmatic constraints determining antecedent preferences. It was found that unlike the native controls, neither the heritage speakers nor the L2 learners showed pragmatically determined biases for either subjects or objects with either overt pronouns or null pronouns. At the same time, the heritage speakers differed from the L2 learners in two ways. In the case of overt pronouns, the heritage speakers showed a stronger pragmatically inappropriate bias for subject antecedents than either the native controls or the L2 learners, while in the case of null pronouns, the L2 learners showed a weaker pragmatically appropriate bias for subject antecedents than either the native controls or the heritage speakers.

In a study on morphological errors in Spanish, Montrul (2011b) found that both heritage speakers and L2 learners differed from fully fluent native speakers in the percentage rates of morphological errors made, although the two groups exhibited different task effects related to the differences in their respective experiences with the language. Benmamoun and Albirini (2018) compared Arabic heritage speakers and Arabic L2 learners with regard to their acquisition of Standard Arabic and found that the two groups performed comparably—including difficulties faced and error patterns—but that while the L2 learners did not display clear transfer effects from their L1, English, the heritage speakers did show transfer effects from their L1, Colloquial Arabic. Montrul (2011a) observes that characteristics shared by heritage speakers and L2 learners include non-nativelike attainment and transfer errors from the dominant language. See Montrul (2016, pp. 296-297) for more on the similarities and differences between heritage speakers and L2 learners.

With regard to L1 nativelikeness, high-proficiency heritage speakers are in the minority (Montrul, 2016; Polinsky, 2018). Although nativelike L1 proficiency seems to be possible for some heritage speakers in some grammatical areas (Kupisch et al., 2017), it is generally not observed in all areas of linguistic knowledge (Montrul, 2016). Montrul (2016) observes that the question of how nativelike heritage speakers can be in more than one grammatical area of their L1 is one few have attempted to answer. Håkansson (1995) looked at noun phrase morphology and word order among heritage speakers of Swedish and found that while their noun phrase morphology showed evidence of attrition, their word order did not. Au et al. (2002) looked at phonology and morphosyntax among receptive heritage speakers of Spanish (“overhearers”) and L2 learners of Spanish; they found that the heritage speakers were significantly more nativelike than the L2 learners on phonology measures, whereas on morphosyntax measures the two groups

patterned similarly, both significantly underperforming prototypical native speakers of Spanish. In a similar vein, this dissertation looks at, among other things, L1 nativelikeness in more than one area of linguistic knowledge among both heritage speakers and school bilinguals.

In sum, age of L2 exposure; language use, input, and exposure; and socioaffective factors appear to be important predictors of successful heritage language acquisition and individual variation in heritage language proficiency. Heritage speakers are often L2-dominant, demonstrating a shift in dominance from the L1 to the L2, L1 gaps compared to their L2, L2 transfer in their L1, non-nativelike L1 performance, and L1 attrition. They pattern like L2 learners of their L1 in some ways but differ from them in others. Given the similarities in the backgrounds of heritage speakers and school bilinguals, we may find that for school bilinguals, the same factors prove to be similarly relevant for language acquisition, with the same or similar linguistic outcomes.

For a comprehensive overview of Arabic heritage speakers in the United States, see Albirini (2018a).

#### 1.5.4 Target Population: Important Characteristics

The target population of this dissertation consists of school bilinguals schooled at Jerusalem School (now also known as Jerusalem American School), a full-immersion English-medium K-12 school in the (Arabic-speaking) East Jerusalem area.

##### *1.5.4.1 Jerusalem (American) School*

Jerusalem School exhibits many important characteristics that are relevant to second language acquisition and similar to those of a typical monolingual English-medium school in the United States. The following descriptions are drawn from my own experiences as a student at the school from 1989 to 2002: The majority of the student body consisted of Palestinian and Arab

Israeli locals (L1 Palestinian Arabic) and Palestinians who, until the time of schooling, were US-based heritage speakers of Arabic (L2 American English) who were mostly English-dominant. For everything except for Arabic language classes, the vast majority (95%+) of the faculty were native speakers of American English; English was the medium of instruction for all grade levels and all classes; the curriculum was American, with virtually no modifications for the non-US setting; textbooks, which were shipped from the US, were intended for use in American schools with monolingual American-English-speaking students (i.e., no ESL textbooks were used); and Arabic was strictly forbidden on school grounds during school hours, and students could be punished for violating this rule. Other than Arabic, there was virtually no language instruction. The vast majority of the students spoke highly advanced English and, in layman's terms, "sounded American." For the most part, any non-native features would have probably fallen under what Abrahamsson and Hyltenstam (2008) describe as "nonperceivable non-nativeness" (pp. 483-485).

In the early 2000s, some of the linguistic characteristics of the school environment began to change. Due to political instabilities, a substantial number of students and teachers left the country, with few new students with the linguistic profile of the typical student enrolling, and few new American teachers joining the staff. In an effort to counter the effects of the ensuing imbalance (and to remain economically afloat), the school resorted to hiring some local teachers for non-Arabic subjects and accepting clearly non-native(like) speakers of English as students (i.e., transfers from local Arabic-medium schools). There started to be a very noticeable linguistic divide between the students: the "school veterans" who spoke highly fluent, unaccented American English, and the "newcomers" whose English was passable but indisputably non-native. For the first time in the school's history, high school English classes

were divided into “English A” (for the former group) and “English B” (for the latter group), which was supplemented by an ESL class. Over the past twenty years, the linguistic dynamics of the school have oscillated between those of the situation during the 1990s and some version of the changes brought about by the political situation.

#### 1.5.4.2 Diglossia

The target population’s L1, Arabic, is a diglossia language. The most famous definition of *diglossia* is from Ferguson (1959):

*DIGLOSSIA is a relatively stable language situation in which, in addition to the primary dialects of the language (which may include a standard or regional standards), there is a very divergent, highly codified (often grammatically more complex) superposed variety, the vehicle of a large and respected body of written literature, either of an earlier period or in another speech community, which is learned largely by formal education and is used for most written and formal spoken purposes but is not used by any sector of the community for ordinary conversation. (p. 336)*

In Al-Sobh et al. (2015), Arabic diglossia is defined as

the phenomenon of co-existence of two distinct language varieties in the same speech community each of which is used for specific linguistic and communicative purposes by its speakers. In the case of Arabic, the standard variety (classical Arabic) is used in formal speeches, university lectures and news media. In contrast, the colloquial variety is used in everyday speech in informal conversational situations by ordinary educated and uneducated Arabs alike. (p. 274)

In Arabic-speaking communities, colloquial Arabic (the largely spoken variety, naturalistically acquired as a native language) coexists with Modern Standard Arabic or MSA (the largely

written variety, which is nobody's native language). MSA is mostly uniform across the Arabic-speaking world, while there are numerous distinct varieties of colloquial Arabic, some of which are not mutually intelligible. In the case of the target population, the colloquial variety of Arabic spoken, i.e., the variety they acquired as an L1, is Palestinian Arabic.

There have been numerous attempts to delineate and articulate the differences between the two language varieties that coexist in a diglossia relationship (Baker, 2006; Ferguson, 1959; Hudson-Edwards, 1984; Zughouli, 1980). At least as regards Arabic, some of the distinctions laid out are not entirely accurate, reflecting an oversimplification of a complex phenomenon (cf. Alsaifi, 2016, p. 3; Gallego, 2010, p. 355; and Hamam, 2014, who refers to a “diglossic *continuum*” [p. 167]). For example, in recent years, Moroccan Arabic has started to be used and written on a massive scale “in spheres from which it was absent before” (Caudet, 2018, p. 387), and a similar observation can be made about Palestinian Arabic, largely due to the rise of social media. Nevertheless, the literature does present a number of central ideas that are accurate and of relevance to this study's target population: (1) MSA is largely written while colloquial Arabic is largely spoken; (2) much of MSA is acquired through schooling; (3) the two varieties are generally used in different domains (cf. “domain of language use” [Fishman, 1972, p. 244] and the “complementary principle” [Grosjean, 1997, p. 165], introduced in reference to bilinguals but generally applicable to Arabic diglossia as well).

Alsaifi (2016) claims that MSA is universally understood by all Arabs. Presumably, Alsaifi is thinking of prototypical native speakers Arabic who have been schooled in Arabic. As Arabic-medium schooling is a significant factor in the acquisition of MSA by native speakers of Arabic, the fact that the target population's schooling was primarily at an English-medium school means that their acquisition of MSA will have been significantly hampered. Their MSA

production and comprehension are likely to lag significantly behind the proficiency levels of prototypical native speakers of Arabic. Furthermore, the minority status of Arabic in Israel means that native speakers of Arabic living in Israel have less exposure to Modern Standard Arabic than do native speakers of Arabic in countries in which Arabic is the predominant language (Khamis-Dakwar & Makhoul, 2014).

Generally speaking, global proficiency in Arabic necessitates proficiency in both varieties of the language (Giolfo & Sinatora, 2011, p. 126). In the case of the target population, it is safe to assume that most individuals will not have the levels of global proficiency generally found among prototypical native speakers of Arabic. This is because the majority of their schooling was not in an Arabic-medium setting and, as a result, their MSA proficiency does not match that of prototypical native speakers of Arabic (while there are no native speakers of MSA, prototypical native speakers of Arabic, who have been schooled in Arabic, exhibit the highest MSA proficiency levels). Thus, at least in the majority of cases, nativelikeness will at best be observed in Palestinian Arabic only. This is in contrast to English, which is not a diglossia language. Given that full-immersion schooling in English includes a large degree of exposure to and use of English in a range of registers, for different purposes, and using the four skills of speaking, listening, reading, and writing, it is reasonable to expect that global nativelikeness in English can be possible.

See Mejdell (2018) for a comprehensive overview of diglossia and Snow (2013) for an analysis of its complexities.

## 1.6 SUMMARY

This chapter laid the foundation for this dissertation by discussing key concepts and motivating the study. It showed the importance of studying ultimate attainment and

nativelikeness and demonstrated that type and amount of input, age of onset, language aptitude, and socioaffective factors impact ultimate attainment and nativelikeness. The chapter then demonstrated, based on prior research, that L2 nativelikeness in more than one domain (the primary focus of this dissertation) is difficult to attain and thus most likely necessitates a particular favorable set of factors favoring successful acquisition. Early bilinguals were then discussed as particularly suitable candidates for L2 nativelikeness research, with a particular focus on heritage speakers and school bilinguals, the target population of this study. Bilingual dominance, the secondary focus of this dissertation, was also discussed. The target population's school was described in detail, demonstrating its suitability for this study, and the concept of diglossia, an important aspect of the target population's L1, was presented. Chapter 2 will proceed to provide a practical framework for the study, by looking at the process of measuring nativelikeness as it pertains to this study. In particular, it will address the practice of using the prototypical native speaker as a benchmark, and it will motivate and discuss the linguistic areas chosen to measure nativelikeness in this study.



## **CHAPTER 2: MEASURING NATIVELIKENESS**

### **2.1 INTRODUCTION**

How do we measure nativelikeness? What tools and instruments do we use? What linguistic areas do we target? What standards or criteria do we use to determine whether a speaker is or is not nativelike? These questions are not easy to answer, as language proficiency covers a range of different language areas and skills, and it is not always easy to determine what performance must be observed in order for a speaker to qualify as nativelike. This chapter addresses two key elements of measuring nativelikeness: Section 2.2 discusses the use of the prototypical native speaker as a benchmark, while Section 2.3 motivates the choice of linguistic areas that were selected to measure nativelikeness in this study and whose results were analyzed for this dissertation. Additionally, this section describes each of those linguistic areas in detail and indicates what L2 learners need to know in order to master their grammatical features. Section 2.4 summarizes the chapter.

### **2.2 THE PROTOTYPICAL NATIVE SPEAKER AS A BENCHMARK**

Much of the skepticism about the possibility of L2 nativelikeness comes from the use of L1 data as a benchmark; by and large, on any given measure, any L2 speaker that does not pattern like L1 speaker controls—for example, by performing below the L1 mean, with a statistically significant difference—is generally judged non-nativelike, with the implication that departures from L1 performance are indicative of a non-L1-like language learning mechanism. While there are certainly advantages to using native speakers as a benchmark (Lardiere, 2013, pp. 675-676), systematic conclusions about L2 speakers' language learning mechanisms based on comparisons of their performance with that of native speakers run the risk of oversimplification when the L2 speakers are so proficient as to be potential candidates for

nativelikeness. After all, there is considerable variation among L1 speakers as well (Dąbrowska, 2012; Dąbrowska, 2018; Hulstijn, 2019)—for example, in the use of pragmatic markers (Fant, 2016) and in lexical knowledge (Bardel, 2016)—so there is no reason to assume that every departure from the performance observed among a specific control group of L1 speakers is necessarily indicative of a defective learning mechanism or incomplete acquisition.

As Sorace (2013) puts it, “the empirical question facing L2 research is exactly what constitutes divergence, what forms divergence can take, and which of these forms can or cannot be part of the make-up of a *natural language grammar* [emphasis added]” (p. 135). A more nuanced approach should tease apart divergence that is indicative of a faulty learning mechanism and divergence that is not (cf. Birdsong, 2005, p. 322). Hawkins and Hattori (2006) caution against interpreting nativelike L2 performance as evidence of shared underlying grammatical representations, but at the same time, we cannot necessarily conclude that the underlying grammatical representations are *not* shared. In fact, there is no reason to reject the possibility that they can be, if certain conditions are met.

If we assume that at least some L2 learners can have a non-defective language learning mechanism and share underlying grammatical representations with L1 speakers even if their performance exhibits some departures from that of L1 controls, then those departures must have alternative explanations that are not incompatible with the existence of fully operational language learning mechanisms, complete acquisition, and a natural grammar. Possible explanations for differences between L1 and L2 speakers could be (a) bilingualism effects or (b) the development of a new variety spoken by a specific social subgroup.

Since, as discussed earlier, the bilingual is not two monolinguals in one, some departures from monolingual performance could be due to inevitable bilingualism effects—which,

importantly, could also affect L1 performance—rather than a faulty learning mechanism leading to incomplete acquisition. Ellis (1994) argues that prior linguistic knowledge must always be taken into account when studying SLA; prior linguistic knowledge may in some cases lead to departures from monolingual performance, but this need not mean that the learning mechanism is flawed. Another possibility is the development of a new variety spoken by a specific social subgroup (cf. Sharma, 2012). Divergence that, on the surface, may appear to indicate incomplete acquisition may in fact be systematic (Papp, 2000), and according to Fant (2016) “L2 users who live in a bilingual and bicultural environment may develop specific mixed or intercultural styles in their linguistic and discursive practices” (p. 27). Thus, some departures from monolingual L1 performance, rather than being the product of an interlanguage indicative of incomplete acquisition, could be evidence of a new variety of the language, one that is akin to the many varieties or dialects that have developed in monolingual settings.

Despite the issues with rigidly using native speakers as a benchmark, this study used the performance of prototypical native speaker controls as a first step towards assessing nativelikeness; at the same time, the dangers of oversimplification were kept in mind, and alternative explanations were considered if they seemed plausible.

### 2.3 TARGETED LINGUISTIC AREAS

Because the primary focus of this study is *nativelikeness*, and because the target population was assumed to have high proficiency in both languages, it was important to avoid ceiling effects, as, for example, in a study by Birdsong and Molis (2001), where 20% of late learners with an age of onset of 17 or older performed within the native-speaker range on a grammaticality judgment task because the test was too simple.

It was expected that linguistic areas that behave differently in English and Arabic would be sufficiently demanding to be good measures of nativelikeness, since, by virtue of behaving differently in each language, they are particularly vulnerable to negative interference or *intrusive transfer* (Ringbom, 2013). When intrusive transfer is maximized, nativelike performance (i.e., resisting interference) becomes a particularly strong indicator of nativelikeness, since cross-linguistic interference in cases of dissimilarity between languages often leads to errors (see Jiménez Catalán, 1996 and Lindstromberg, 2010 for examples of how this manifests itself in the area of preposition use). Thus, for this study, five such linguistic areas were selected: article semantics, verbal aspect, resumptive pronouns, double objects, and adverb word order.

The study was normed with L1 speakers and intermediate to advanced L2 speakers of each language, who were tested on their knowledge of each of the areas described above. In the norming study, none of the L2 learners scored within the native-speaker range on all five areas exhibiting differences between Arabic and English, suggesting that nativelike performance on all five areas would be a strong indicator of nativelikeness.

In addition to the five linguistic areas mentioned above, formulaic language was included in the study since it is an area that has been demonstrated to be challenging for L2 learners, i.e., that most low-level learners would not be able to completely master. Of the many different possible types of formulaic language that could have been tested, idioms and proverbs were selected because these were the two types of formulaic language Abrahamsson and Hyltenstam (2009) tested. While formulaic language was tested in the study, the results were not analyzed for this dissertation; idioms and proverbs tap into lexical knowledge as opposed to features of the target-language grammar, so it was determined that it would be best to analyze those results separately.

Below, I present and discuss in detail the five linguistic areas that were targeted in this study and whose results were analyzed for this dissertation.

### 2.3.1 Article Semantics

In English, when the definite article *the* is used with a plural noun, it unambiguously encodes specificity and cannot be used to refer to generics, for which a bare plural must be used (Chierchia, 1998; Dayal, 2004). (1) unambiguously refers to a specific group of lions, whereas (2) unambiguously refers to lions in general.

(1) The lions are scary.

(2) Lions are scary.

In Palestinian Arabic, in contrast, the definite article *il-* (or *li-*), when used with a plural noun, can encode either specificity or genericity, and bare plurals are ungrammatical in the subject position. (3) can refer either to a specific group of lions or to lions in general, while (4) is ungrammatical.

(3) *li-'sūd muxifīn*.

DEF-lions scary

'The lions are scary.' / 'Lions are scary.'

(4) \**'sūd muxifīn*.

lions scary

Palestinian Arabic shares this pattern with Spanish and other Romance languages, as demonstrated by Al-Malki et al. (2014). As they show, under the Nominal Mapping Parameter proposed by Chierchia (1998a, 1998b), NPs in Arabic and Spanish are exclusively predicative  $[-arg, +pred]$  and therefore cannot occur in an argument position unless they are licensed by a determiner, whereas NPs in English can be either argumental or predicative  $[+arg, +pred]$ , so

some English NPs—those that are argumental NPs—can occur in an argument position without a determiner. Thus, the Nominal Mapping Parameter accounts for the licensing of bare NPs in an argument position in English but not in Arabic.

According to Ionin and Montrul (2010), the fact that in Spanish, unlike in English, definite plurals can have a generic interpretation is a “well-known difference between English and Spanish” (p. 878). As shown above, the same difference exists between English and Palestinian Arabic. In their study, which tested the L2 acquisition of this area of English, they found evidence of L1 transfer in the behavior of L2 learners of English: in a truth-value judgment task, L1 speakers of Spanish overaccepted the generic interpretation of the English definite article to a greater extent than did proficiency-matched L1 speakers of Korean, an articleless language. Since Palestinian Arabic patterns like Spanish in this area, we may find a similar pattern of transfer in the English of L1 speakers of Palestinian Arabic who are L2 speakers of English.

In Spanish, unlike in English, generic readings, which in English are obtained with a  $\emptyset$  article, call for the use of the definite article, and a  $\emptyset$  article is disallowed for generic readings (Eizmendi Álvarez, 2016; Gutiérrez-Mangado & Martínez-Adrián, 2018). Hallman (2018a) observes that in Italian, the definite plural may have either a generic reading or a specific or referential reading, and León González et al. (2017) observe that in Spanish, Galician, and Catalan, one of the uses of the definite article is a “general use” whereby it denotes “all individuals or items from a group” (p. 148); in other words, the definite article is used to obtain a generic reading. These facts observed for Romance languages also obtain for Palestinian Arabic.

Fassi Fehri (2012) points out that Classical Arabic<sup>4</sup> patterns roughly<sup>5</sup> like Spanish with regard to this feature. Palestinian Arabic does, too. Example 12c from Hallman (2018a, p. 187), reproduced—with a corrected gloss<sup>6</sup>—as (5), demonstrates the referential and generic readings of the definite article in Modern Standard Arabic. *li-klāb bi ‘awwu*, the Palestinian Arabic equivalent of this sentence, allows the same two readings as the Modern Standard Arabic sentence. There is, incidentally, a third reading, in which the noun is referential and the verb is habitual, not progressive (“The dogs bark.”), also both allowed by Modern Standard Arabic and Palestinian Arabic. English, in contrast, does not allow a generic reading if the definite article is used; it only allows either of the referential readings (and the aspect, progressive or habitual, is morphologically encoded in the verb form).

- |      |                         |                   |
|------|-------------------------|-------------------|
| (5)  | al-kilaab-u             | ta-nbaḥ-u.        |
|      | the-dogs-nom.           | 3.sing.-bark-ind. |
| (i)  | ‘The dogs are barking’. | [referential]     |
| (ii) | ‘Dogs bark’.            | [generic]         |

L2 learners of English whose L1 is Palestinian Arabic need to be aware that in English, the definite article does not allow a generic reading, but only a referential or specific one; conversely, L2 learners of Palestinian Arabic whose L1 is English need to be aware that in Palestinian Arabic, the definite article allows two different readings: a generic one and a referential one. As noted by Azaz (2019), “in acquiring the semantics of definite plurals in Arabic, English-speaking learners need to overcome L1 effects from English and map definite

<sup>4</sup> By and large, Classical Arabic has the same grammar and syntax as Modern Standard Arabic.

<sup>5</sup> The one difference is that in contrast to Romance languages, Arabic lacks an overt indefinite article, a difference that is not relevant to this study.

<sup>6</sup> In the original example, the verb form is glossed as third person plural but is in fact third person singular. While this is not relevant to the semantics of the definite article, I have made the correction to avoid confusion.

plurals to their generic meanings as well as to their specific meanings” (p. 277). In his study, which tested beginning, low-advanced, and high-advanced L2 learners of MSA whose L1 was English, he found that on a sentence completion task, the L2 participants’ ability to accurately supply definite articles with generic readings improved with increasing proficiency: the three groups’ accuracy means were 16.50%, 49.16%, and 92%, respectively, and the differences between the three groups were all statistically significant, as were the differences between the native control group, which had an accuracy mean of 100%, and each of the beginning and low-advanced groups. The only between-group difference that was not statistically significant was that between the high-advanced group and the native control group, suggesting that this is an area of difficulty for L2 learners with a low likelihood of nativelikeness except at very advanced stages of learning, where nativelikeness might be possible. The low-advanced and high-advanced group also completed a prompted oral narrative task designed to elicit definite articles with generic readings and once again, there was a statistically significant difference between the two groups’ performance. For NPs with generic readings, the low-advanced groups produced definite articles 56.43% of the time and the high-advanced group did so 90% of the time.

With regard to the acquisition of bare-plural generics in English, Umeda et al. (2019) used an acceptability judgment task to test L1 Japanese learners of English before and after they received explicit instruction in this area and found that for NP-level bare-plural generics, they showed statistically significant improvement between the pre-test and each of the first and second post-tests but not the third and fourth, and for sentence-level bare-plural generics, they showed statistically significant improvement between the pre-test and each of the first three post-tests but not the fourth. This suggests that in this area, the knowledge L2 speakers attain after explicit instruction may be difficult to maintain long-term.



### 2.3.2 Verbal Aspect

In English, the present simple tense is used for regular or habitual actions, while the present progressive (or continuous) tense is used for ongoing actions occurring at the time of speaking (Fernández, 1998). Example 4 from Al-Buainain (1992, p. 331), reproduced here as (6), demonstrates the contrast between present simple and present progressive in English. The present simple *walks* refers to the subject's habitual action of walking to work, whereas the present progressive *is going* refers to the subject's present action of going to work by bus, which he does not habitually do.

(6) He usually walks to work, but today he is going by bus.

(7) and (8) demonstrate this further. (7) means that Samantha regularly or habitually plays chess but does not say anything about whether Samantha is currently playing chess. (8), in contrast, only tells us that Samantha is currently playing chess, but does not tell us anything about whether she regularly or habitually does so.

(7) Samantha plays chess.

(8) Samantha is playing chess.

In Palestinian Arabic, in contrast, the simple present tense can be used in either case, while the present tense with the particle *'am* specifically indicates an ongoing action occurring at the time of speaking. Thus, for ongoing actions occurring at the time of speaking, either choice (the bare present tense, or the present tense with *'am*) is grammatical. (9) can mean either that Sami regularly or habitually plays chess or that he is currently playing chess, while (10) can only mean that he is currently plays chess.

(9) Sami bil'ab šaṭaranj.

Sami plays chess

‘Sami plays chess. / Sami is playing chess.’

(10) Sami ‘am bil‘ab šaṭaranj.

Sami PROG plays chess

‘Sami is playing chess.’

Palestinian Arabic differs from Modern Standard Arabic in this area. In reference to Modern Standard Arabic, Al-Buainain (1992) states that the present simple and present progressive forms are “identical,” which is another way of saying that there is only one form used for both. Similarly, Al-Thubaiti (2015) says that in Modern Standard Arabic, the imperfective form<sup>7</sup> can have either a habitual or progressive interpretation. Unlike Modern Standard Arabic, Palestinian Arabic does have a particle, ‘*am*, that can be used to unambiguously express the progressive; however, the particle is not (always) obligatory. Like Palestinian Arabic, a number of other dialects have a progressive marker; examples include *gaafid* in Hijazi Arabic (Al-Thubaiti, 2015), *yālis* in Emirati Arabic (Jarad, 2015), and *fī/fi* in Tunisian Arabic (McNeil, 2017; Ritt-Benmimoun, 2017).<sup>8</sup> In addition to ‘*am*, Palestinian also has ‘*ammāl* (to which personal pronouns can optionally attach) and ‘*ā‘ed*. Importantly, in the absence of a progressive marker, the present tense form in Palestinian Arabic is ambiguous between a progressive and habitual interpretation (cf. Al-Thubaiti, 2015, p. 190, on Hijazi Arabic).

Thus, in comparing English to Palestinian Arabic, we see that while the aspectual distinctions described above are similar in and of themselves (El-Hassan, 1987), the two languages differ in the way they express them (Al-Thubaiti, 2015; Ingham, 1980). Ingham

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<sup>7</sup> The form that many linguists call the *imperfective* in Modern Standard Arabic, on the premise that it encodes aspect and not tense, could arguably be considered to encode tense and be called the *present tense*. For the purposes of the study, this is merely a matter of terminology, as the facts that are relevant to the study are the same regardless of what the form is called. In any case, this is the form that corresponds to what I am calling the present tense in Palestinian Arabic.

<sup>8</sup> Here I use the transliterations used in the original works.

(1980) describes the Arabic tense and aspect system as “a very economic system because it expresses a great number of tenses and aspects by few forms” (p. 147). Although progressive particles are available as aspect markers in a number of Arabic dialects, they are mostly not obligatory.

L2 learners of English whose L1 is Palestinian Arabic need to be aware that in English, progressive aspect must be expressed morphologically using the present progressive form, i.e., that the present simple tense cannot express progressive aspect. Conversely, L2 learners of Palestinian Arabic whose L1 is English need to be aware that in Palestinian Arabic, a progressive marker is not obligatory and that the simple present tense can be used to express a progressive action. Prior studies on the acquisition of the distinction between the present simple and the present progressive in English have produced mixed results. Slabakova (2003) found that even though the distinction between habitual and progressive aspect is not grammaticalized in Bulgarian, L1-Bulgarian L2-English speakers with varying levels of proficiency in English (low intermediate, high intermediate, and advanced) successfully produced simple present and present progressive forms in English and successfully associated meaning with form in a truth-value judgment task testing this distinction. In contrast, Hawkins et al. (2008), who used an acceptability judgment task to test the acquisition of this distinction by advanced L2-English speakers with various L1s (Arabic, Chinese, French, German, Japanese, and Spanish), concluded that across all the groups tested in the study, there were non-targetlike underlying representations and L1 effects. Thus, it appears that this can be a challenging area even for advanced L2 speakers.

### 2.3.3 Resumptive Pronouns

Resumptive pronouns are overtly pronounced pronouns appearing in a position from which a syntactic element is posited to have moved, i.e., from which that element has been “extracted.” For the most part, resumptive pronouns in relative clauses are ungrammatical in English but obligatory in Palestinian Arabic. Sentences (11)-(14) demonstrate the differences between English and Palestinian Arabic with regard to the use of resumptive pronouns in relative clauses:

(11) This is the bag that I bought *t*.

(12) \*This is the bag that I bought it.

(13) hāy iš-šanta illi štarēt-ha.

This the-bag that bought.1<sup>st</sup>pers.sing.-it

‘This is the bag that I bought.’

(14) \*hāy iš-šanta illi štarēt.

This the-bag that bought.1<sup>st</sup>pers.sing.

‘This is the bag that I bought.’

According to Algady (2018), “Arabic and English differ with respect to the operations involved in the derivation of relative clauses, such that, while English uses *move* of an operator to generate relative clauses, in Arabic they are base-generated with a resumptive pronoun in the extraction site and are hence derived through (external) *merge*” (p. 181), and Alroudhan (2016) refers to this difference as “the main difference between Arabic and English [restrictive relative clauses]” (p. 36). Both Algady and Alroudhan are referring to Modern Standard Arabic. In this area, Palestinian Arabic patterns just like Modern Standard Arabic, with one notable exception: unlike Modern Standard Arabic, Palestinian Arabic does not allow a gap (i.e., it requires a

resumptive pronoun) when the extraction site is a direct object (Choueiri, 2018, p. 135). This means that in this area, Palestinian Arabic is even more distant from English than is Modern Standard Arabic. Yuan and Zhao (2005, Table 1) provide a comparison between English and Palestinian Arabic with regard to the distribution of gaps and resumptive pronouns in relative clauses.

In English, while resumptive pronouns are not wholly ungrammatical in every conceivable sentence, their distribution is very limited and influenced by linear distance, depth, and extractability (McKee & McDaniel, 2001). Generally speaking, a resumptive pronoun is not licensed unless it is linearly far from its head, it is embedded, and/or a trace is not licensed, so if none of these conditions is met (i.e., the extraction site is not linearly far from the head, it is not in an embedded clause, and a trace is licensed at the extraction site), a resumptive pronoun is ungrammatical in English. This is demonstrated in (15)-(21), provided by McKee and McDaniel (2001, pp. 114-115). While (15) is ungrammatical, (16) and (17) are improved over (15) due to linear distance and embeddedness, respectively. (18) is grammatical and (19) is ungrammatical because a trace is licensed in this sentence, whereas (20) is ungrammatical and (21) is grammatical because a trace is not licensed in this sentence. This analysis is supported by other syntactic accounts of resumptive pronouns in English (McDaniel & Cowart, 1999; Morgan & Wagers, 2018).

(15) \*This is the camel that he likes Oscar.

(16) (improved over 15): This is the camel that maybe, maybe, maybe he likes Oscar.

(17) (improved over 15): This is the camel that I think he likes Oscar.

(18) That's the girl that I like *t*.

(19) \*That's the girl that I like *her*.

(20) \*That's the girl that I don't know what *t* did.

(21) That's the girl that I don't know what *she* did.

In Palestinian Arabic, in contrast, resumptive pronouns are always obligatory when the extraction site is an object (cf. Elomari's, 1998, syntactic account of resumptive pronouns in Moroccan Arabic). Example 7 in Alroudhan (2016, p. 36) shows the behavior of Modern Standard Arabic in this area: if the extraction site is a direct object, a resumptive pronoun is optional, and if the extraction site is an indirect object or an oblique object, a resumptive pronoun is obligatory. In Palestinian Arabic, a resumptive pronoun is obligatory in all three cases. See Choueiri (2018) for a good overview of resumption in Arabic varieties.

With regard to second language acquisition, prior studies have suggested that when the L1 and the L2 diverge with regard to resumptive-pronoun behavior, L1 transfer can lead to errors in the L2. Algady (2018) tested the acquisition of resumptive pronouns in Modern Standard Arabic as an L2. The participants' Modern Standard Arabic proficiency ranged from novice high to advanced low on the ACTFL scale, and according to the demographic information given, 12 out of the 16 participants had only English as an L1, while four had English as well as at least one other language—which was Palestinian Arabic in one case—as native languages. While this is a limitation of the study, the fact that 12 out of 16 participants (75%) had only English as a native language does mean that the results do at least point to overall trends for L1-English speakers. The participants overaccepted gaps when the extraction site was an indirect object or an oblique object. When the extraction site was a direct object, they underaccepted gaps. Since Palestinian Arabic diverges from Modern Standard Arabic with direct-object extraction sites, we cannot use the direct-object results to extrapolate to Palestinian Arabic. However, the two

varieties of Arabic do have the same patterns for the other two extraction site types, and the overall results suggest that this can be an area of difficulty for L2 speakers of Palestinian Arabic.

Alroudhan (2016) found similar results in the other direction. She tested advanced L2 speakers of English whose L1 was Arabic and found that they overaccepted resumptive pronouns in English, possibly due to L1 transfer. Yuan and Zhao (2005) tested the acquisition of resumptive pronouns in L2 Chinese among five participants whose L1 was Palestinian Arabic. These participants had achieved a score of at least 70% on a measure testing their ability to provide targetlike judgments of Chinese sentences with a subject gap in a relative clause, and this was taken as evidence that the participants had mastered the basic structure of Chinese relative clauses, which was used as an eligibility criterion for participation. Chinese allows both gaps and resumptive pronouns when the extraction site is an indirect object or an oblique object (for which the authors use the terms *genitive/object-of-noun*), but allows only gaps when the extraction site is a direct object. This contrasts with Palestinian Arabic, which requires resumptive pronouns in all three cases. The authors found that the participants with Palestinian Arabic as an L1 overaccepted resumptive pronouns with direct-object extraction sites, possibly due to L1 transfer and/or an overgeneralization of Chinese's acceptance of resumptive pronouns with indirect-object and oblique-object extraction sites. While the small sample size of five is a significant limitation of the study, the results do lend support to the idea that this can be an area of difficulty for L2 learners when the L1 and the L2 diverge.

L2 learners of Palestinian Arabic whose L1 is English need to be aware that unlike in English, Palestinian Arabic consistently requires resumptive pronouns with all object extraction sites. Conversely, L2 learners of English whose L1 is Palestinian Arabic need to be aware that in English, unlike in Palestinian Arabic, resumptive pronouns are almost always ungrammatical.

This challenge may be more difficult than the converse challenge for L1-English speakers, because learning that resumptive pronouns are ungrammatical requires negative evidence (Becker, 2001). Additionally, the fact that English does allow resumptive pronouns in limited cases may further complicate matters and lead to overgeneralization of acceptable resumptive pronouns. Tryzna (2013) observes that L1 Arabic speakers who are learning English may produce ungrammatical resumptive pronouns in English due to negative L1 transfer (cf. Simoiu, 2016 on transfer of resumptive pronoun use from L1 Romanian to L2 English). Tryzna suggests that a possible theoretical explanation for this is that the syntax of relative clauses may be subject to a resistance to resetting L1 parametric values. She provides eight examples of ungrammatical resumptive pronouns in the English writing of Kuwaiti students who were generally proficient in English (p. 198).

#### 2.3.4 Double Objects

Arabic and English differ in terms of which verbs allow a double object construction (DOC) in each language. Such verbs, which are sometimes called *ditransitive verbs*, allow two consecutive objects without an intervening preposition (Mohamed, 2014; Yáñez-Bouza, 2016). When considering verbs with straightforward, more or less direct semantic equivalents in the other language, we find that some verbs allow double objects in both languages; others allow them in English but not in Arabic; while others disallow them in both languages. For example, the verbs *give* and *feed* allow double objects in both languages; the verbs *send* and *throw* allow them in English but not in Arabic; and the verbs *describe* and *display* disallow them in both languages. In many cases, transitive verbs that do not allow double objects will allow an alternate construction using a preposition. In (22)-(30), all the ungrammatical sentences become grammatical when a preposition is used.



- (22) Mary gave John the book.
- (23) Mary sent John the book.
- (24) \*Mary described John the book.
- (25) Mary described the book to John.
- (26) Amer 'a'ṭa Samira li-ktāb.  
Amer gave Samira DEF-book  
'Amer gave Samira the book.'
- (27) \*Amer ba'at Samira li-ktāb.  
Amer sent Samira book
- (28) Amer ba'at la-Samira li-ktāb.  
Amer sent to-Samira DEF-book  
'Amer sent Samira the book. / Amira sent the book to Samira.'
- (29) \*Amer waṣaf Samira li-ktāb.  
Amer described Samira DEF-book
- (30) Amer waṣaf la-Samira li-ktāb.  
Amer described to-Samira DEF-book  
'Amer described the book to Samira.'

As described by Amer (1996), both English and Arabic have “alternating verbs” (verbs that allow both a DOC and a construction with a preposition), “verbs with no DOC alternation” (verbs that allow a construction with a preposition only), and “verbs with no dative alternation” (verbs that allow a double object construction only) (pp. 67-70, 139-140, 165, 189). While the Arabic examples he gives are from Modern Standard Arabic, the corresponding Palestinian Arabic verbs have the same properties.

In their analysis of the DOC in English, Coleman and de Clerck (2011) provide a list of what they call “present-day DOC verb classes,” including “verbs which inherently signify acts of giving,” “verbs of type of communicated message (i.e. verbs of telling, teaching, and showing,” and “verbs of obtaining,” which are semantic categories under which verbs allowing a DOC fall (Table 1). The fact that the list includes thirteen different verb classes shows how complex the English DOC system is. Because there are so many different semantic categories of verbs that allow this construction, L2 learners are likely to face significant challenges acquiring the system, since semantics does not offer a particularly helpful clue. As Goldberg (2006) says, “verbs are occasionally quite idiosyncratic in the types of argument structure patterns they appear in” (p. 56). In his analysis of the English verb *explain*, which does not allow a DOC, Klotz (2019) maintains that existing approaches fail to account for this behavior. Klotz proposes that this is related to the verb’s etymology: he suggests that the verb’s predominant meaning in modern English derives from a now obsolete meaning, “to make physically flat or plain,” and that the verb follows the syntactic behavior of its source, the Latin *explanare*, which virtually never occurred with a DOC. Klotz observes that this shows “the extent to which lexemes carry their history with them” (p. 351). Klotz’s account seems plausible; if he is right, then when it comes to licensing a DOC or not, some of the argument structure of English verbs may be due to etymological reasons that are not transparent synchronically, potentially posing L2 acquisition difficulties.

Hamdan’s (1996) analysis of the DOC in Jordanian Arabic (which patterns like Palestinian Arabic in the areas discussed by Hamdan) maintains that “broad-range” semantic constraints related to argument structure are insufficient to distinguish between verbs that allow the DOC and verbs that do not (pp. 44-47). Hamdan posits “narrow-range” semantic constraints

instead: “verbs whose semantic structure requires the involvement of both the agent and the goal in the implementation of the act” and verbs that “signify motion into or towards a body or an object” (p. 57), which are further subdivided into “ballistic motion” and “steady motion” (pp. 54-57). This suggests that the Palestinian Arabic DOC system, while possibly less complex than that of English, may nevertheless be rather challenging for L2 learners with English as an L1, who need to acquire the semantic constraints that are in place in Palestinian Arabic, which do not entirely overlap with those of English. As stated above, there are many verbs that allow the DOC in one language but whose semantic equivalents in the other language do not; this increases the likelihood of unsuccessful or incomplete L2 acquisition in this area, due to intrusive L1 transfer.

Thus, while English and Palestinian Arabic both have the DOC, they do not have the same criteria for which verbs allow it and which verbs do not. These criteria can be difficult to learn even when the L1 does not have a DOC; the difficulty may be compounded when, as in this case, the L1 does have a DOC but not the same DOC system as the L2. Furthermore, Hallman’s (2018b) detailed analysis of the syntax of the DOC in Syrian Arabic (which, again, patterns like Palestinian Arabic in the areas discussed<sup>9</sup>) reveals that L2 learners must acquire a fairly complex set of syntactic rules governing the use of the DOC.

### 2.3.5 Adverb Word Order

Another difference between English and Palestinian Arabic relates to the word order of adverbs of frequency. Specifically, in simple sentences consisting of a subject, a non-copular finite main verb, and an object in that order, English and Palestinian Arabic differ with regard to

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<sup>9</sup> Hallman classifies the verb *warrat* ‘to bequeath’ as a verb that does not allow a DOC. In Palestinian Arabic, it does, and based on the judgments of a number of native speakers of Syrian Arabic, it does in Syrian Arabic as well, so this appears to be an error on Hallman’s part. In any case, the classification of this particular verb does not detract from Hallman’s main arguments and their applicability to Palestinian Arabic. This particular example can be safely disregarded.

which of four possible positions (before the subject, between the subject and the verb, between the verb and the object, and after the object) adverbs can occupy. These positions will hereinafter be referred to as ASVO, SAVO, SVAO, and SVOA, respectively. Table 2 indicates the grammatical and ungrammatical positions for six adverbs of frequency in English, and Table 3 provides the same information for seven adverbs of frequency in Arabic: two equivalents for *never* and one equivalent each for the other five English adverbs.

**Table 2:** English Adverbs of Frequency (G = grammatical; U = ungrammatical)

	ASVO	SAVO	SVAO	SVOA
<i>always</i>	U	G	U	G
<i>every day</i>	G	U	U	G
<i>every week</i>	G	U	U	G
<i>never</i>	U	G	U	U
<i>sometimes</i>	G	G	U	G
<i>usually</i>	G	G	U	G

**Table 3:** Palestinian Arabic Adverbs of Frequency (G = grammatical; U = ungrammatical)

	ASVO	SAVO	SVAO	SVOA
<i>dāyman</i> , ‘always’	G	G	G	G
<i>kul yōm</i> , ‘every day’	G	G	G	G
<i>kul ’usbū</i> , ‘every week’	G	G	G	G
<i>wala marra</i> , ‘never’	G	G	U	U
<i>wala ’umro/’umurha</i> ‘never’	G	G	U	U
<i>marrāt</i> , ‘sometimes’	G	G	G	G
<i>’ādatan</i> , ‘usually’	G	G	G	G

As Tables 2 and 3 show, Palestinian Arabic allows many more combinations than does English. Crucially, in Arabic (both Modern Standard Arabic and Palestinian Arabic), an adverb of frequency may appear between a non-copular finite main verb and its complement, which is not the case in English (Dehham, 2014; Engels, 2012; Laenzlinger, 1998; Muftah & Wong, 2011; White, 1991). One explanation for this difference is that the two languages set different parameters on verb movement, thus determining what positions adverbs may and may not occupy (Laenzlinger, 1998; Muftah & Wong, 2011, 2014; White, 1991).

In English, copular and auxiliary verbs are subject to different verb movement parameters than non-copular finite verbs, which is why, for example, *He is always an asset* and *He can sometimes act immature* are grammatical but *He eats always pancakes* is not. Some ungrammatical word orders become grammatical through inversion or *do*-insertion; for example, *Never he eats soup* is ungrammatical, but *Never does he eat soup* and *Never has he eaten soup* are grammatical (Dehham, 2014, p. 41). However, there is no syntactic strategy that can repair an ungrammatical SVOA position, as in *He eats soup never*. In general, frequency adverbs can appear in the pre-subject position (ASVO) (*always* and *never* are exceptions), and in the post-object position (SVOA) (*never* is an exception). To sum up, with non-copular finite main verbs without inversion or *do*-insertion, English does not allow SVAO, but, depending on the adverb, it does allow ASVO, SAVO, and SVOA (Kanduboda, 2017, p. 953). In Palestinian Arabic, in contrast, all frequency adverbs generally allow all four word orders; the only exceptions in Table 3 are *wala marra* and *wala 'umro/'umurha*, which do not allow SVAO or SVOA.

Previous studies have suggested that L2 English adverb word order can be difficult to acquire for L1-Arabic speakers. Muftah and Wong (2011) administered a grammaticality judgment task to 240 L1-Arabic speakers with intermediate to advanced proficiency in English (based on the results of the Oxford Placement Test) and found that their performance was not nativelike: they underaccepted SAV (subject-adverb-verb) and overaccepted SVA (subject-verb-adverb) word orders. The authors interpret this as support for the Failed Functional Features Hypothesis (Hawkins & Chan, 1997), which argues that adult L2 learners are unable to reset L1 parameters to L2 settings where they two differ. Muftah and Wong (2014) and Dehham (2014), who also tested L1-Arabic speakers' acquisition of English adverb word order, using an oral production task and a sentence unscrambling task, respectively, found similar results. In a study

on the acquisition of L2 adverb word order by L1-French speakers, White (1991) found that only those who had specifically received instruction in this area acquired the restrictions on adverb word order in English due to verb movement parameter settings. To my knowledge, no such studies have been conducted on adverb word order in Arabic. It may be the case that L1-English learners of Palestinian Arabic as an L2 may underaccept certain word orders due to the differences in parameter settings between their L1 and their L2.

Thus, L2 learners of English whose L1 is Palestinian Arabic need to be aware that English is far more restricted than Palestinian Arabic with regard to the word orders allowed for adverbs of frequency, and they need to be aware of the specific parameter settings that apply in English. They need to be aware of the settings that apply to different adverbs, and they need to resist overgeneralizing the exceptions related to copular verbs, auxiliary verbs, inversion, and *do*-insertion. L2 learners of Palestinian Arabic whose L1 is English need to be aware that Palestinian Arabic is far *less* restricted than English in this area, although there are some restrictions. They need to be aware of those restrictions (i.e., they need to resist overgeneralizing grammatical word orders to adverbs for which those word orders are ungrammatical). In other words, they need to be aware of the specific parameter settings that apply in their L2 (Palestinian Arabic), and they need to be aware of the settings that apply to different adverbs.

## 2.4 SUMMARY

This chapter addressed the practice of using prototypical native speakers as a benchmark for nativelikeness. It showed that this practice is not unproblematic and indicated that this was kept in mind in the analysis of this study's results. The chapter proceeded to present and discuss the five linguistic areas that were chosen for the study's measures on nativelikeness and whose results were analyzed for this dissertation. It was shown that in selecting these areas, transfer and

the results of the norming study were both taken into account. The conclusion was that there was evidence to suggest that nativelike performance on all five areas would be a strong indicator of nativelikeness. Finally, the chapter provided a detailed treatment of each of the five linguistic areas and indicated what knowledge L2 learners need to have in order to master the five grammatical areas selected. Chapter 3 will provide a description of the design and methodology of the present study, including the pilot study on which it was based,<sup>10</sup> research questions and hypotheses, participants, and instruments.

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<sup>10</sup> The pilot study was a different study from the norming study. The present study replicated some elements of the pilot study and expanded it significantly. The norming study consisted of an initial version of the expanded study, which was subsequently modified based on the results of the norming study. The post-norming version is the version that was run for the experiment that constituted the present study.



## **CHAPTER 3: THE PRESENT STUDY: DESIGN, METHODOLOGY, AND PARTICIPANTS**

### **3.1 INTRODUCTION**

The previous two chapters provided the background motivation for the present study and described some of the important elements that motivated the study's design. This chapter zooms in on the details of the study by providing a description of its design and methodology, as well as the participants. Section 3.2 provides a brief overview of the study, Section 3.3 describes the pilot study on which the present study was based, and Section 3.4 presents the study's research questions and hypotheses and describes the instruments and the participants. Section 3.5 summarizes the chapter.

### **3.2 OVERVIEW OF THE STUDY**

Most studies on nativelikeness have investigated L2 acquisition in an immigration context in which the L2 is the majority language (e.g., Abrahamsson and Hyltenstam, 2009). This study, in contrast, focused on a different population of bilinguals—school bilinguals—and investigates their degree of nativelikeness in various linguistic domains of their L1 and L2. This study sought to find out whether full-immersion schooling in the L2 can lead to L2 nativelikeness even when the L2 is not the societal language. Bilingualism through full-immersion schooling differs from bilingualism resulting from immigration: while the former is the result of a conscious choice on the part of parents or caregivers, the latter is an inevitable byproduct of the reality of immigrants.

Because school bilinguals demonstrate a number of factors (most notably, age of onset, type of input, and amount of input) favoring successful, perhaps nativelike, ultimate attainment, this study aimed to find out whether they exhibit L2 nativelikeness, and if not, how close to nativelike they are. The study also aimed to investigate school bilinguals' L1 knowledge to see

how it compares with that of prototypical L1 speakers and whether there is evidence of L1 attrition. In case of inconsistent results within the group, the study aimed to identify whether certain individual factors may explain the observed variation. Additionally, the study aimed to look at dominance and identify whether school bilinguals are dominant in their L1 or their L2.

It is my sense that school bilinguals are an extremely understudied population; in fact, the term *school bilinguals* as such does not even exist to my knowledge. This population has not received much attention from researchers interested in L2 nativelikeness, possibly because L2 schooling, even full-immersion L2 schooling, in an otherwise L1 environment is generally not considered to be, or has not been sufficiently demonstrated to be, a factor that could lead to nativelikeness in individuals who otherwise would not be nativelike.

### 3.3 PILOT STUDY

The present study builds on a pilot study conducted with a group of 10 Palestinian Arabic<sup>11</sup>-English school bilinguals (five females) who received the vast majority of their schooling at Jerusalem School. The study tested their English and Arabic knowledge and compared them to English-speaking heritage speakers of Arabic and, for each language, a control group of native speakers.

The pilot study consisted of an experiment with two Arabic tasks and two English tasks. For each language, there was an Elicited Production Task (EPT) testing knowledge of idioms and proverbs, and a Grammaticality Judgment Task (GJT) testing verb-preposition dependencies and resumptive pronouns. The school bilinguals and the heritage speakers completed all four tasks, while the two groups of native controls each completed only the two tasks in their respective language.

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<sup>11</sup> For the sake of simplicity, Palestinian Arabic will henceforth be referred to as *Arabic* unless otherwise specified.

In each EPT, participants were presented with idioms and proverbs missing the final word, which participants were asked to supply. In each GJT, participants were presented with sentences and asked to rate each sentence on a scale of 1-3 based on how natural it sounded, with 3 being “absolutely natural” (طبيعية للغاية in Arabic) and 1 being “absolutely unnatural” (غير طبيعية in Arabic). The GJTs tested verb-preposition dependencies and resumptive pronouns with relative clauses and topicalization.<sup>12</sup>

On the EPTs, the native controls’ accuracy means on English idioms, English proverbs, Arabic idioms, and Arabic proverbs were 98%, 99%, 99%, and 96%, respectively. On the English EPT, the school bilinguals’ accuracy means on idioms and proverbs were 75% and 99%, respectively. Compared to the English EPT, their performance on the Arabic EPT was lower on both idioms and proverbs (with accuracy means of 66% and 67%, respectively). On the individual level, of the 10 school bilinguals, seven scored within the native control range on both idioms and proverbs, and three did so on proverbs but not on idioms. In contrast, on the Arabic tasks, only one scored within the native control range on both proverbs and idioms, only two did so on proverbs but not idioms, and seven did not score within the native control range on either. The heritage speakers’ performance on the English EPT was at ceiling on idioms and proverbs (with means of 96% and 99%, respectively), and on the Arabic EPT, they were at floor (with means of 1% and 5% on idioms and proverbs, respectively).

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<sup>12</sup> An example of an English sentence with topicalization is *This problem my uncle did hear about*. In English sentences with topicalization, *do* insertion was employed (*This problem my uncle did hear about* as opposed to *This problem my uncle heard about*), with the goal of evoking contexts in which the subject is being contrasted with something else and emphasized through topicalization. The sentence *This problem my uncle did hear about* was intended to evoke a context such as “Several problems have occurred in the past week, and my uncle has been oblivious to all of them, but this problem, as opposed to all the others, my uncle did hear about.” The Arabic sentences with topicalization had the same structure as the English sentences, with the exception of *do* insertion, which does not have a syntactic equivalent in Arabic.

On the GJTs, the target rating was 3 out of 3 for grammatical items and 1 out of 3 for ungrammatical items. For verb-preposition dependencies, the English and Arabic native controls' mean ratings on grammatical items were 2.90 and 2.84, respectively. On ungrammatical items, the Arabic controls performed at ceiling (with a mean of 1.18), while the English controls' performance was somewhat below ceiling, but still very high (1.48). For English, the school bilinguals' performance was high, although not at ceiling (they had a mean of 2.72 on grammatical items and a mean of 1.42 on ungrammatical items). For Arabic, their performance was lower than it was for English on ungrammatical items (with a mean of 1.65), and about the same as it was for English on grammatical items (with a mean of 2.75). On the individual level, of the 10 school bilinguals, five scored within the English native control range on both grammatical and ungrammatical items, four did so on one but not the other, and one did not score within the native-speaker range on either. For Arabic, five scored within the native control range on both grammatical and ungrammatical items, three did so on grammatical items but not ungrammatical items, and two did not score within the native-speaker range on either. For English, the heritage speakers' performance was at ceiling on grammatical items (with a mean of 2.88) and high (although not at ceiling) on ungrammatical items (with a mean of 1.4). For Arabic, their performance, although not at floor, was lower than it was for English; their means on grammatical and ungrammatical items were 2.36 and 2.22, respectively. The latter mean of 2.22 is almost at chance.

For resumptive pronouns, the English native controls gave high ratings to grammatical items and low ratings to ungrammatical items, with one notable exception: sentences with topicalization were given low ratings regardless of grammaticality. The same pattern was observed for the other two groups, whose ratings were overall similar to those of the control

group. For Arabic, the control group gave high ratings to grammatical items and low ratings to ungrammatical items, with no observed topicalization effect. The school bilinguals gave low ratings to ungrammatical items and somewhat high ratings to grammatical items (not as high as those of the control group). The heritage speakers performed somewhat similarly to the school bilinguals, with higher ratings given to ungrammatical items and somewhat lower ratings given to grammatical items with relatives.

The topicalization effect observed in the results for resumptive pronouns suggests that, out of context, grammatical sentences with topicalization in English may tend to be perceived by native speakers as ungrammatical. The school bilinguals patterned like the control group, with no statistically significant differences between the two groups, suggesting that the school bilinguals had the same intuitions about topicalization as the English native controls. Overall, the results of the English task very clearly supported the presence of nativelikeness in both the school bilinguals and the heritage speakers.

For Arabic, the results painted a very different picture. For three of the eight categories of sentences tested, a significant effect of group was found, and post-hoc comparisons revealed a number of significant effects. For the school bilinguals and the heritage speakers, significant effects were found for two of the eight categories. In both cases, the school bilinguals outperformed the heritage speakers, suggesting that, although the two groups patterned similarly overall, the school bilinguals were more targetlike than the heritage speakers, which is unsurprising given the former's greater amount of exposure to Arabic. Even less surprisingly, the control group clearly outperformed the heritage speakers, with significant effects found for six of the eight categories. In every one of these cases, the control groups outperformed the heritage speakers, so overall, the results clearly suggested that the heritage speakers were not nativelike.

What is more crucial is that the school bilinguals were also outperformed by the native controls, albeit less dramatically than the heritage speakers. Post-hoc comparisons revealed significant effects for four of the eight categories. In every one of these cases, the native controls outperformed the school bilinguals, suggesting that the school bilinguals, although more targetlike than the heritage speakers, were also not nativelike.

Four out of 10 school bilinguals scored within the native control range (as do many English-speaking heritage speakers of Arabic) on idioms, proverbs, and both grammatical ungrammatical sentences testing verb-preposition dependencies. Although the native controls outperformed the school bilinguals as a group, the results strongly suggested that at least for some people, full-immersion schooling in an L2 can lead to L2 nativelikeness. Meanwhile, on resumptive pronouns, the overall results revealed that the school bilinguals patterned like the native controls in English but were outperformed by the native controls in Arabic, suggesting that full-immersion schooling in an L2 can lead to nativelike L2 attainment at the expense of targetlike L1 attainment. School bilinguals patterned like heritage speakers in English and somewhat better in Arabic, suggesting that although heritage speakers have greater exposure to English while school bilinguals have greater exposure to Arabic, the heritage speakers have no observable advantage over school bilinguals when it comes to English proficiency, while school bilinguals do have an advantage over heritage speakers when it comes to Arabic proficiency. Overall, however, the similarities between school bilinguals and heritage speakers with regard to how each group's results compared with those of the controls suggested that in terms of linguistic outcomes, school bilinguals may be heritage speakers in their own country.

### 3.4 DESCRIPTION OF THE STUDY

The pilot study tested only a small number of linguistic skills, and the results may or may not be generalizable to other areas of linguistic competence. The present study built upon this research by testing a broader range of skills. Furthermore, the fact that on the English tasks, for everything but resumptive pronouns, the performance of some, but not all, school bilinguals was within the native control range raised important questions about individual variation and the factors responsible for it, so the present study aimed to address this point as well.

#### 3.4.1 Research Questions and Hypotheses

The present study was guided by five research questions. The first three questions all relate to the L2, the school language; and RQ4 and RQ5 relate to the status of the L1 and language dominance.

- RQ1: If the home and societal language is the L1, can full-immersion schooling in the L2 lead to L2 nativelikeness?
- RQ2: If the home and societal language is the L1, is full-immersion schooling in the L2 *sufficient* for L2 nativelikeness?
- RQ3: Do language use and exposure, language aptitude, and social, personal, and attitudinal factors contribute to individual variation?
- RQ4: Can full-immersion schooling in the L2 lead to nontargetlike L1 competence?
- RQ5: Can full-immersion schooling in the L2 lead to balanced bilingualism? If not, in which of the two languages will the bilinguals be *dominant* with regard to proficiency?

Based on both the literature and the findings of the pilot study, the following hypotheses were formed in response to the research questions:

- H1: Yes. If the home and societal language is the L1, full-immersion schooling in the L2 can lead to L2 nativelikeness.
- H2: No. If the home and societal language is the L1, full-immersion schooling in the L2 is not sufficient for L2 nativelikeness, and some school bilinguals will not pattern like monolingual L2 controls.
- H3: Yes. Language use and exposure, language aptitude, and social, personal, and attitudinal factors contribute to individual variation.
- H4: Yes. Full-immersion schooling in the L2 can lead to nontargetlike L1 competence.
- H5: With regard to proficiency, the school bilinguals will be dominant in English.

H1 and H2 were based on the findings of the pilot study: some participants had nativelike L2 performance, while others did not. H3 was based on the literature, and specifically the research on language aptitude, which suggests that language aptitude may compensate for any deficits preventing nativelikeness even among individuals learning their L2 under otherwise optimal conditions. Like H2, H4 and H5 was based on the findings of the pilot study: the L1 performance of the school bilinguals was not nativelike, and their L2 performance was stronger (closer to nativelike) than their L1 performance.

It was expected that a considerable number of school bilinguals would be nativelike in English, and that closely analyzing their answers to the questionnaire and the results of the language aptitude test would provide a fuller understanding and deeper appreciation for the factors that can lead to nativelikeness in this environment. This, in turn, was expected to make an important contribution to the field at large.

If very few participants (if any) were nativelike in English on every measure, the study was still expected to add to the existing body of literature suggesting that nativelikeness is



extremely hard to achieve even under optimal conditions. No matter what the results were in terms of English nativelikeness, the study was expected to make an important contribution in terms of dominance and how the two languages of the target population control. It was expected that most of the school bilinguals would be dominant in English. Additionally, it was expected that they would outperform heritage speakers on Arabic tasks, and on English tasks, their performance would be like that of heritage speakers or somewhat below; in any case, it was expected that there would be a greater gap between school bilinguals' Arabic proficiency and that of heritage speakers than there would be between the English proficiency of each group. No matter what the results were about how the two languages of the school bilinguals compare to each other or about how their proficiency in either language compares to that of heritage speakers, the results were expected to constitute a significant contribution to the field because to date, very little is known about this population.

#### 3.4.2 Instruments

The instruments used in the study targeted nativelikeness and dominance. The choice and design of the instruments was motivated by an interest in successfully answering the research questions and testing the hypotheses. Because of the interest in testing school bilinguals' proficiency in both English and Arabic, the instruments included parallel tasks in both languages.

Four instruments—an Elicited Production Task (EPT) and a Free Production Task (FPT) in each language—were included in the study but their results were not analyzed for this dissertation. The EPTs were designed to test knowledge of formulaic language, which, as discussed earlier, was excluded from analysis because it taps into lexical knowledge. The FPTs were included as a measure of dominance, and their results were not analyzed for this dissertation due to time constraints.

The instruments that were included in the analysis of the study results were the following:

1. Linguistic questionnaire
2. Language aptitude test
3. Elicited Imitation Task (EIT) in each language
4. Truth Value Judgment Task (TVJT) in each language
5. Grammaticality Judgment Task (GJT) in each language

The TVJTs and the GJTs targeted the specific linguistic areas discussed in Chapter 2:

1. Semantics: article semantics and verbal aspect
2. Morphosyntax: resumptive pronouns, double objects, and adverb word order

The TVJTs and GJTs tested several different semantic and morphosyntactic phenomena, with the goal of tapping into nativelikeness in a number of areas of linguistic knowledge, as opposed to nativelikeness in a specific area or linguistic domain. As discussed earlier, because of the study's focus on *nativelikeness*, and the assumed high proficiency in both languages among the target population, the TVJTs and GJTs targeted the linguistic constructions discussed in Chapter 2, which were considered particularly well suited to measure nativelikeness because they behave differently in English and Arabic and are likely to lead to persistent transfer effects in cases of incomplete acquisition. The EITs were included because of the study's secondary focus on *dominance*, and were selected based on tasks used in prior research on dominance (see below for more details).

The GJTs was partially based on the GJTs discussed by Abrahamsson and Hyltenstam (2009). To test morphosyntactic skills, that study took accuracy measures from a written GJT and both accuracy measures and reaction times from an auditory GJT. The present study measured morphosyntactic knowledge by taking, for each language, accuracy measures from a

single GJT with both written and oral stimuli. Additionally, it included, for each language, a TVJT testing semantic knowledge.

Of the five linguistic areas tested in the TVJTs and GJTs, one—resumptive pronouns—had also been tested in the pilot study. Verb-preposition dependencies, which were also tested in the pilot study, were not included in this study; other areas were chosen instead because the differences they exhibit between English and Arabic are clearer.

A cloze test was originally designed for each language as a proficiency measure and a screening tool, with the intention of eliminating potential participants who scored below a certain score. The results of the norming study pointed to ceiling effects and thus revealed that the cloze tests were not challenging enough to be an effective measure of proficiency. Additionally, upon further reflection, it was determined that for the present study, it was not necessary to screen out potential participants whose proficiency was below a certain level: since the tasks were designed to target advanced proficiency and nativelikeness, participants' performance was expected to reveal any non-nativelike proficiency.

Each part of the GJTs and TVJTs contained token sets with either two, four, or six categories, with an even balance of grammatical and ungrammatical items in the GJTs and true and false items in the TVJTs. In each case, the token sets were converted into two lists, meaning that for token sets with four categories, each list contained pairs of items from the same token set, and for token sets with six categories, each list contained triplets of items from the same token set. Within a list, pairs or triplets from the same token set were matched for grammaticality or truth value, with an equal number of grammatical and ungrammatical, or true and false, items within each list. The items in the GJTs, TVJTs, and EITs were distributed across blocks and randomized within each block.

See Appendices A-E for instructions, stimuli, and target responses.

#### *3.4.2.1 Linguistic Questionnaire*

A linguistic questionnaire was administered to the two bilingual groups. The purpose of the linguistic questionnaire was to help answer RQ3 by targeting factors other than language aptitude that might explain individual variation.

The linguistic questionnaire consisted of two parts. The first part asked about participants' use and exposure of English and Arabic (including speaking, listening, reading, and writing) in different settings (home, school, and other) at different points of their lives. The second part tested socioaffective factors by asking participants to rate their agreement or disagreement with various statements on a scale of 0 to 10. There were a total of 120 statements. There were 40 statements targeting social factors, 40 targeting personal factors, and 40 targeting attitudinal factors. Within each group of 40 statements, 20 statements related to English and the United States, and 20 statements related to Arabic and the Arab World; and within each group of 20 statements, 10 statements related to the time when the participant was in school, and 10 statements related to the time since the participant's graduation from high school. Some of the statements were borrowed or adapted from those used by Schmid and Dusseldorp (2010) and Gardner (2004); the rest were my own.

See Appendix A instructions and stimuli.

#### *3.4.2.2 Language Aptitude Test*

A language aptitude test was administered, with the goal of attempting to answer RQ3 by seeing if language aptitude would correlate with any individual variation that might be observed. To measure language aptitude, three of the four sections of the LLAMA test (Meara, 2005)—LLAMA\_B, LLAMA\_E, and LLAMA\_F—were used. As in the other instruments, instructions

were given in both English and Arabic. Versions or adaptations of the LLAMA test were used by Abrahamsson and Hyltenstam (2008), Bylund et al. (2009), and Bylund et al. (2012). Although the LLAMA test's validity as an instrument measuring language aptitude has not yet been conclusively demonstrated (Rogers et al., 2017), there is significant evidence for its reliability (Granena, 2013). LLAMA\_D was not included in this study because evidence suggests that the skills it measures are distinct from those measured by the other three parts (Granena, 2013).

The three sections used for the language aptitude test were adapted in Qualtrics from the most recent versions available at the time of experiment design. The three sections, including visual and audio stimuli, were replicated as is with a small number of exceptions. In LLAMA\_B and LLAMA\_F, words were displayed along with the images they corresponded to; in the original versions, test-takers had to hover over images to see the corresponding words, a format that was chosen to keep the displays as simple as possible (P. Meara, personal communication, April 23, 2019). In LLAMA\_E, <o> was used instead of <i>, and <a> instead of <u>. In the original version, <e> represented [a], <i> represented [i], and <u> represented [u]. <i> and <u> were replaced with characters that do not typically correspond to the sounds represented, so that no participant had the unfair advantage of familiar sound-symbol correspondences. Additionally, in LLAMA\_E and LLAMA\_F, four answer choices (one in LLAMA\_E and three in LLAMA\_F) were changed due to errors or inconsistencies.

See Appendix B for instructions, stimuli, and target responses.

#### *3.4.2.3 Elicited Imitation Tasks*

Two Elicited Imitation Tasks (EITs), one in each language, were administered as a tool to measure dominance and help answer RQ5. In an EIT, participants listen to oral stimuli (such as sentences) and are asked to repeat them immediately after hearing them. Flege et al. (2002) used

this method to measure dominance in Italian-English bilinguals, and Verhoeven et al. (2012) found correlations between dominance and performance on EITs in Turkish-Dutch bilinguals. As discussed by Marinis and Armon-Lotem (2015), research has shown that assuming an EIT uses sentences that are long enough to be impossible to repeat verbatim simply by passive copying, this task measures participants' implicit knowledge of the language's grammatical system: participants are not able to successfully repeat the sentences if they have not (fully) acquired the targeted structures, as successful repetition requires them to be able to process the sentences at the phonological, morphosyntactic, and semantic levels and produce the extracted meaning using representations from their long-term memory.

For the English task, the LITMUS English SRep Task (Marinis & Armon-Lotem, 2015), with thirty total sentences, was used, with one modification: the British English word *mum* was replaced with the American English equivalent *mom*. The Arabic task was designed in such a way as to maximize comparability with the English task. This was done with the goal of addressing an issue raised by Treffers-Daller (2015), who points out that it is very difficult to create parallel versions of the same task for the purposes of comparing proficiency in two languages, due to factors such as cultural differences and linguistic relativity.

The English task targeted, among other things, structures that have been shown to be difficult for children with specific language impairment (SLI) (Marinis & Armon-Lotem, 2015). The Arabic task targeted features that have been demonstrated to be difficult for speakers with SLI and/or L1 or L2 speakers with typical development (TD): plurals (Abdalla et al., 2013; Albirini & Benmamoun, 2014; Aljenaie, 2010; Daana, 2009; Fahim, 2005; Nawwab, 2009; Omar, 1973; Ravid & Farah, 1999; Ravid & Hayek, 2003; Saiegh-Haddad et al., 2012; Shaalan, 2010; Siddiki, 2002), clitics (Shaalan, 2010), gender (Alhawary, 2005, 2009; Bartning, 2016),

and verb tense (Abdalla, 2002; Abdalla & Crago, 2008; Aljenaie et al., 2011; Fahim, 2005, 2017; Morsi, 2009; Qasem & Sircar, 2017).

Like the English task, the Arabic task consisted of thirty sentences. The Arabic sentences matched the English sentences in number of syllables; and the number of morphemes, the number of content morphemes, and the number of function morphemes in the Arabic sentences matched the number of words, the number of content words, and the number of function words in the English sentences. The reason English words were matched with Arabic morphemes, and not Arabic words, is that Arabic is a much more synthetic language than English, and many Arabic words consist of several morphemes that correspond to multiple words in English. The English sentences had an average of 8.77 words ( $SD = 1.28$ ), 3.63 content words ( $SD = 0.85$ ), 5.13 function words ( $SD = 1.01$ ), and 10.43 syllables ( $SD = 1.48$ ). The Arabic sentences had an average of 8.40 morphemes ( $SD = 1.94$ ), 3.27 content morphemes ( $SD = 0.78$ ), 5.13 function morphemes ( $SD = 1.68$ ), and 10.67 syllables ( $SD = 1.88$ ).

The Arabic sentences were also broken into a similar number of categories as the English sentences. The English sentences belonged to nine categories, eight categories of three sentences each and one category with six sentences; and the Arabic sentences belonged to 10 categories of three sentences each.

The nine categories of English sentences, including the number of sentences in each category, are given in Table 4; and the 10 categories of Arabic sentences are given in Table 5.

**Table 4:** Sentence Categories Used in English Elicited Imitation Task

Category	Number of Sentences
1. Sentences with Subject-Verb-Object word order with compound verbs with one auxiliary or modal verb	3
2. Sentences with Subject-Verb-Object word order with compound verbs with two auxiliary verbs or one auxiliary verb and one modal verb	3
3. Sentences with short actional passives	3
4. Sentences with long actional passives or non-actional passives	3
5. Questions with <i>who</i> , <i>what</i> , or <i>which</i> in object position	6
6. Sentences with <i>before</i> , <i>after</i> , or <i>because</i> clauses as sentential adjuncts	3
7. Sentences with conditionals as sentential adjuncts	3
8. Sentences with right-branching object relative clauses	3
9. Sentences with center-embedded object relative clauses	3



**Table 5:** Sentence Categories Used in Arabic Elicited Imitation Task

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1. Sentences with imperative verbs and no plurals, clitics, or feminine nouns without feminine-gender marking
2. Sentences with imperative verbs and broken plurals containing glides
3. Sentences with imperative verbs and broken plurals containing broken geminates
4. Sentences with imperative verbs and broken plurals not containing glides or broken geminates
5. Sentences with imperative verbs and sound masculine plurals
6. Sentences with imperative verbs and sound feminine plurals
7. Sentences with imperative verbs and clitics
8. Sentences with imperative verbs and feminine nouns without feminine-gender marking followed by feminine adjectives
9. Sentences with present-tense verbs
10. Sentences with past-tense verbs

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See Appendix C for instructions and stimuli.

#### *3.4.2.4 Truth Value Judgment Tasks*

To test participants' knowledge of semantics in each language, two Truth Value Judgment Tasks (TVJTs), one in each language, were administered. Each TVJT targeted both article semantics and verbal aspect; within each TVJT, the article semantics items served as fillers for the verbal aspect items and vice versa. Article semantics and verbal aspect were chosen because they behave differently in Arabic and in English, as discussed below. Each TVJT consisted of 48 items, 24 testing article semantics and 24 testing verbal aspect. Below, example

sentences are given for each condition, followed by a three-character abbreviation identifying that condition.

#### 3.4.2.4.1 Article Semantics

In the English TVJT, participants were presented with stories in which a specific group of animals exhibited an unusual characteristic not found among the general class. Participants were asked to evaluate the truth value of four sentence types, in which plurals with *the* and bare plurals were crossed with the specific characteristic of the unusual group and the generic characteristic of the class, as in (31)-(34), where (32) and (33) are true statements while (31) and (34) are false.

- (31) The chickens have two legs. (THF)
- (32) Chickens have two legs. (BRT)
- (33) The chickens have three legs. (THT)
- (34) Chickens have three legs. (BRF)

In the Arabic TVJT, the design was the same except that the two bare plural sentence types (which would be ungrammatical in Arabic) were replaced with two other sentence types. In addition to the equivalents of (31) and (33) above, both of which are true in Arabic, the other two sentence types were a) sentences using the demonstrative plural *hadōl* ‘these’ and the generic characteristic of the class, and b) sentences using *kul ... bil- ‘ālam* ‘all ... in the world’ and the specific characteristic of the unusual group. This is exemplified in (35)-(38) below, where (35) and (36) (the equivalents of (31) and (33) above) are true statements while (37) and (38) are false.

- (35) is-salāḥef baṭi’īn. (GNC)

DEF-turtles slow

‘The turtles are slow. / Turtles are slow.’

(36) is-salāḥef sari‘īn. (SPC)

DEF-turtles fast

‘The turtles are fast. / Turtles are fast.’

(37) hadōl is-salāḥef baṭi‘īn. (DEM)

DEM DEF- turtles slow

‘These turtles are slow.’

(38) kul is-salāḥef bil-‘ālam sari‘īn. (ALL)

all DEF-turtles in-the-world fast

‘All the turtles in the world are fast.’

The English stories were adaptations of some of the items used by Ionin and Montrul (2010), and the Arabic stories were modeled on the English stories. In the Arabic stories, all the subjects were morphologically plural nouns; collective plurals, like *is-samak* ‘fish’, which take singular verb agreement, were not used to ensure that all verbs were plural verbs.

See Appendix D for instructions and stimuli, with each item identified as TRUE or FALSE.

#### 3.4.2.4.2 Verbal Aspect

In the English TVJT, participants were presented with stories in which a character was doing something that he or she did not regularly or habitually do. Participants were asked to evaluate the truth value of four sentence types, both referring to the action currently being done: one using the present simple, one using the present progressive, and two using the negated versions of the first two types. For example, (7) and (8), reproduced as (39) and (40), would correspond to a story in which Samantha is uncharacteristically playing chess; (39) is false while

(40) is true. (41), which is the negated version of (39), would be true; and (42), the negated version of (40), would be false.

(39) Samantha plays chess. (PSP)

(40) Samantha is playing chess. (PPP)

(41) Samantha does not play chess. (PSN)

(42) Samantha is not playing chess. (PPN)

In the Arabic TVJT, the design was the same except for one sentence type: instead of the negated present tense, the fourth sentence type was one in which the progressive form was used with an action different from and incompatible with the one in the story, i.e., one that could not plausibly cooccur with the action in the story. For example, a story in which Sami is uncharacteristically playing chess would correspond to (9) and (10), reproduced as (43) and (44), as well as (for example) (45) and (46); (43) and (44) are true, while (45) and (46) are false.

*‘am* was not obligatory in any of the sentences that had it. None of the sentences included a word like “now” that could have been used to disambiguate aspect; all sentences without *‘am* were syntactically ambiguous between habitual and progressive.

(43) Sami bil‘ab šaṭaranj. (PSP)

Sami plays chess

‘Sami plays chess. / Sami is playing chess.’

(44) Sami ‘am bil‘ab šaṭaranj. (PPP)

Sami PROG plays chess

‘Sami is playing chess.’

(45) Sami ‘am bil‘ab kurat qadam. (PPD)

Sami PROG plays ball foot

‘Sami is playing soccer.’

(46) Sami miš ‘am bil‘ab šaṭaranj. (PPN)

Sami NEG PROG plays chess

‘Sami is not playing chess.’

See Appendix D for instructions and stimuli, with each item identified as TRUE or FALSE.

#### 3.4.2.5 Grammaticality Judgment Tasks

Two GJTs, one in each language, were administered to test participants’ grammatical knowledge of resumptive pronouns, double objects, and adverb word order, which were selected because they behave differently in English and Arabic. In SLA research, GJTs have been traditionally considered to be good measures of underlying linguistic competence (Shiu et al., 2018). In recent years, this idea has been questioned (Ionin, in press), but for this study, this was not an issue because none of the participants were being tested in a language they had been taught explicitly.

Participants were presented with a series of sentences. They were asked to determine how natural the sentences sounded to them and to rate each sentence on a scale of 1-6, as follows: 1 = completely unnatural (بمنتهى الركافة); 2 = almost completely unnatural (ركيفة إلى ما يقارب أقصى حد); 3 = mostly unnatural (ركيفة إلى حد بعيد); 4 = mostly natural (طبيعية إلى حد بعيد); 5 = almost perfectly natural (طبيعية إلى ما يقارب أقصى حد); 6 = perfectly natural (بمنتهى الطبيعية). Participants were given a scale of 1-6 rather than a binary scale to avoid forcing them to choose between two extremes if their judgment of a sentence was not categorical (for example, if they found it mostly natural but not perfectly natural for a semantic reason).

Each GJT had three sets of target items, which targeted resumptive pronouns, double objects, and adverb word order, respectively. Within each task, each of the three sets of target items served as fillers for the other two. Additionally, the English GJT had fillers dealing with inversion, and the Arabic GJT had fillers dealing with gender and plural formation. Each GJT consisted of a total of 96 sentences: 12 testing resumptive pronouns, 24 testing double objects, 36 testing adverb word order, and 24 non-target fillers. Below, example sentences are given for each condition, followed by a three-character abbreviation identifying that condition.

#### *3.4.2.5.1 Resumptive Pronouns*

For the resumptive pronouns part of each GJT, the design was a simplified version of the design used in the pilot study. Participants were asked to judge the grammaticality of sentences with and without a resumptive pronoun. For English, the sentences without a resumptive pronoun were grammatical, and the ones with a resumptive pronoun were ungrammatical; and the opposite was true for Arabic. This is exemplified in (47)-(50), where (47) and (49) are grammatical and (48) and (50) are not. None of the English sentences met any conditions for licensing resumptive pronouns in English, and in all of the Arabic sentences, the extraction site was a direct object, meaning that resumptive pronouns were obligatory in all of them.

(47) Nancy used the medicine that the expert invented. (GAP)

(48) \*Nancy used the medicine that the expert invented it. (RES)

(49) Zāhi šireb iš-šāy illi immo ‘imlat-o. (RES)

Zahi drank the-tea mother-his made.3<sup>rd</sup>pers.sing.fem.-it

‘Zahi drank the tea that his mother made.’

(50) \*Zāhi šireb iš-šāy illi immo ‘imlat. (GAP)

Zahi drank the-tea mother-his made.3<sup>rd</sup>pers.sing.fem.

‘Zahi drank the tea that his mother made.’

See Appendix E for instructions and stimuli, with each item identified as grammatical or ungrammatical.

#### 3.4.2.5.2 Double Objects

In both the English and the Arabic GJTs, participants were asked to judge the grammaticality of sentences from each of the three categories described above (double objects allowed in both English and Arabic, double objects allowed in English but not in Arabic, and double objects disallowed in both English and Arabic). Each token set contained sentence triplets that were constructed in such a way as to semantically allow one verb from each category while keeping all other elements constant, as in (51)-(53) and (55)-(57). (51) and (55) are both grammatical because the verb *feed* allows double objects in both English and Arabic. (52) is grammatical but (56) is not because the verb *throw* allows double objects in English but not in Arabic. (53) and (57) are both ungrammatical because the verb *display* disallows double objects in both English and Arabic.

Additionally, a fourth sentence was added to each token set for balance. For English, the fourth category consisted of sentences with semantically implausible verbs (i.e., ones yielding nonsensical sentences that were ungrammatical with double objects and could not be salvaged by introducing a preposition), as in (54). Again, all other elements within each token set remained constant across sentences. For Arabic, the fourth category consisted of sentences with causative verbs that allow double objects and do not have single-word equivalents in English, as in (58). (54) is ungrammatical and (58) is grammatical.

(51) Julie fed Parker the apple. (BTH)

(52) Julie threw Parker the apple. (ENG)

- (53) \*Julie displayed Parker the apple. (NTR)
- (54) \*Julie slept Parker the apple. (NNS)
- (55) Marwa ʔaʕmat Lubna it-tuffāḥa. (BTH)  
 Marwa fed Lubna DEF-apple  
 ‘Marwa fed Lubna the apple.’
- (56) \*Marwa ramat Lubna it-tuffāḥa. (ENG)  
 Marwa threw Lubna DEF-apple  
 ‘Marwa threw Lubna the apple.’
- (57) \*Marwa ʕarḍat Lubna it-tuffāḥa. (NTR)  
 Marwa displayed Lubna DEF-apple  
 ‘Marwa displayed Lubna the apple.’
- (58) Marwa šammamat Lubna it-tuffāḥa. (CAU)  
 Marwa made-smell Lubna DEF-apple  
 ‘Marwa made Lubna smell the apple.’

See Appendix E for instructions and stimuli, with each item identified as grammatical or ungrammatical.

#### 3.4.2.5.3 *Adverb Word Order*

For adverb word order, the token sets for the GJT were designed so that half the items in each set behaved the same in the other language while the other half behaved differently; the main items of interest were those behaving differently, since intrusive transfer was expected to be more likely in those cases.

In both the English and the Arabic GJTs, each token set included the following three sentence types, which are ungrammatical in English but grammatical in Arabic: *always* or *never*



in ASVO; *every day* or *every week* in SAVO; and *sometimes* or *usually* in SVAO. In the English GJT, each token set included three additional sentence types that are grammatical in both languages: *sometimes* or *usually* in ASVO, *always* or *never* in SAVO, and *every day* or *every week* in SVOA. In the Arabic GJT, each token set included three additional sentence types that are ungrammatical in both languages: *wala marra* ‘never’ (literally, “not even once”) and *wala ‘umrol ‘umurha* ‘never’ (literally, “not even his/her life”) in SVAO, SVOA, and VSOA. Within each token set, sentences were identical except for the adverbs used and their positions. This is exemplified in (59)-(70). (59)-(61), which are ungrammatical in English, and (65)-(67), which are grammatical in Arabic, are identical in terms of the adverbs used and their word order. (62)-(64) are grammatical in both languages, and (68)-(70) are ungrammatical in both languages.

None of the sentences included a copula, an auxiliary verb, inversion, or *do*-insertion.

- (59) \*Always John mows the lawn. (P1U)
- (60) \*John every day mows the lawn. (P2U)
- (61) \*John mows sometimes the lawn. (P3U)
- (62) Sometimes John mows the lawn. (P1G)
- (63) John always mows the lawn. (P2G)
- (64) John mows the lawn every day. (P4G)
- (65) dāyman Sara btōkol keks. (P1G)  
always Sara eats cake
- (66) Sara kul yōm btōkol keks. (P2G)  
Sara every day eats cake
- (67) Sara btōkol marrāt keks. (P3G)  
Sara eats sometimes cake

(68) \*Sara btōkol wala marra keks. (P3U)

Sara eats not-even once cake

(69) \*Sara btōkol keks wala 'umurha. (S4U)

Sara eats cake not-even her-life

(70) \*btōkol Sara keks wala marra. (V4U)

eats Sara cake not-even once

See Appendix E for instructions and stimuli, with each item identified as grammatical or ungrammatical.

### 3.4.3 Participant Selection and Experiment Procedure

#### 3.4.3.1 Participant Selection

Four groups were tested, one experimental group and three control groups:

1. The experimental group: school bilinguals (same profile as in pilot study)
2. US-based English-speaking heritage speakers of Arabic
3. A control group of native speakers of English
4. A control group of native speakers of Arabic

The purpose of including the native control groups was for them to serve as a baseline.

The purpose of including the heritage speakers was to measure the effect of the societal language since that is the only crucial factor differentiating the heritage speakers from the school bilinguals (the experimental group).

A screening questionnaire was administered as part of the study with the purpose of eliminating any participants who did not meet certain criteria, depending on the group for which they were recruited. The screening questionnaire included questions about participants' language use and exposure during the first 18 years of their life and since the age of 18.

One participant was eliminated from the school bilingual group because he had only received 25% of his schooling at Jerusalem School. All the other participants in the school bilingual group had received the majority of their schooling at Jerusalem School, between 69% and 100% (average: 89.5%). No other participants were eliminated from the study.

As stated earlier, broad definitions of heritage speakers include those with little to no proficiency in the heritage language, while narrow definitions include only those with high proficiency in the heritage language. For this study, intermediate proficiency—a level of proficiency falling between those two extremes—was used as a criterion for participation. The criteria requested in recruiting participants for the heritage speaker group were the following: participants had to have spent most of the first 18 years of their lives in the US, with Palestinian Arabic as the main language at home and American English as the main language everywhere else, and they had to speak and understand Palestinian Arabic at an intermediate level or better. All those who participated in the heritage speaker group had volunteered or agreed to participate based on meeting these criteria according to their own self-assessment.

As stated earlier, Abrahamsson and Hyltenstam (2009) operationalized the notion “native speaker of Swedish” as “someone who (a) has spoken only Swedish at home during childhood, (b) has had Swedish as the only language of instruction at school, and (c) has lived his or her whole life in a context in which Swedish has been the majority language” (p. 264), and this is the basis of the definition of *prototypical native speaker* for the purposes of this dissertation. For the native control groups, this was used as a starting point in considering whether to eliminate any participants. Participants were asked to indicate their language use and exposure (speaking, listening, reading, and writing) at home, at school, and outside home and school during the first 18 years of their lives by indicating the language(s) they spoke, heard, read, and/or wrote in each

setting as well as the approximate percentage of time spent speaking, hearing, reading, and/or writing each language in each setting. All the participants in the Arabic native control group, and all but two participants in the English native control group, indicated a percentage of 50% or higher use for Arabic and English, respectively, in all three settings. For English, one participant in the English native control group indicated 30% use outside home and school, and one participant indicated 34% use at home, 40% at school, and 34% use outside home and school. According to their responses, these two participants were raised bilingually, with Italian and German, respectively, alongside English. Because their performance on all parts of the experiment fell well within the range of the other English native controls, they were not eliminated from the study.

#### *3.4.3.1 Experiment Procedure*

The experiment was designed and administered online using Qualtrics. All instructions were given in both English and Arabic. For the TVJTs and the GJTs, each stimulus was presented in both written and oral form, and participants were given the option of reading it, pushing a button to listen to a recording, or doing both. For the Arabic tasks, written stimuli were presented in both Arabic script and Latin transliteration. The reason the stimuli were presented in both oral and written form is twofold, and it relates to the diglossia situation discussed in Chapter 1. As a primarily spoken language, Palestinian Arabic does not have a standardized written form (when it is written, the spelling is based on approximations to Modern Standard Arabic orthography). Secondly, not having been educated in Arabic (as a medium of instruction), the school bilinguals and heritage speakers could not be expected to be highly literate (or, in the case of the heritage speakers, literate at all) in Arabic. The stimuli were thus presented in two modes to allow participants to choose whichever mode they felt more comfortable with. Arabic script

and transliteration were both provided so that participants could read whichever they were more comfortable with. Providing these options was expected to address any impacts lack of Arabic literacy may have had on participants' ability to complete the tasks—lack of Arabic literacy was not expected to have impeded acquisition of the structures tested, since all the linguistic structures tested were ones that L1 speakers typically acquire without high literacy. To ensure consistency across tasks, English stimuli were also presented in written and oral form, even though all participants who completed the English tasks were expected to be highly literate in English.

The school bilinguals and the heritage speakers completed the linguistic questionnaire, the language aptitude test, both EITS, both TVJTs, and both GJTs. The native controls completed the language aptitude test, and the EIT, TVJT, and GJT in their native language. Participants completed the experiment independently on their own time. Each participant was assigned a participant number consisting of six characters: *EX* (for “experiment”), a two-code character identifying the participant's group (*SB* for school bilinguals, *HS* for heritage speakers, *EN* for English native controls, and *AR* for Arabic native controls), and a two-digit number identifying the participant (some numbers were repeated across groups, but within each group, each participant had a unique number, so all combinations of group code and participant number are unique). Each participant was provided with a guidelines document, in English and Arabic, that contained important information and instructions. The experiment was broken up into five parts, with a separate survey link for each part. Part 1 contained the consent form, the language aptitude test, and, for the school bilinguals and the heritage speakers, the linguistic questionnaire<sup>13</sup>; Part 2 the English TVJT and GJT; Part 3 the Arabic TVJT and GJT; Part 4 the

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<sup>13</sup> For Part 1, the same link was provided to all participants. However, the Qualtrics survey was set up to include or exclude the linguistic questionnaire depending on each participant's group as identified by their participant number.

English EIT; and Part 5 the Arabic EIT.<sup>14</sup> The survey links were included in the guidelines document. There were two versions of the document, one with links to the List 1 versions of Parts 2 and 3, and one with links to the List 2 versions.

In the guidelines document, participants were informed that all responses were required, and they were instructed to guess if they did not know or were not sure of an answer, or to indicate that they did know. They were asked not to use dictionaries or any other references or sources of aid. They were informed that most sections included practice items, and that with the exception of the learning portions of the language aptitude test, no part of the experiment was timed. The guidelines document emphasized that the Arabic parts were about Palestinian Arabic, not Modern Standard Arabic, and participants were asked not to use Modern Standard Arabic in their responses. They were informed that the materials for Parts 2 and 3 were presented in both written and oral form and that they could choose whether they wanted to read, listen, or both; and that all instructions were given in both English and Arabic and that they were free to read whichever version they were more comfortable with. They were told that they did not need to do all parts in one sitting, but they were instructed to do each part in one sitting, and to follow the given order. For Parts 4 and 5, they were asked to e-mail the recordings to a designated e-mail address. They were also given technical instructions and time estimates for each part of the experiment.

The guidelines document is provided in Appendix F, with the hyperlinks in the last section removed and the e-mail address redacted. Some of the guidelines pertain to the EPTs and the FPTs, whose results were not analyzed for this dissertation.

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<sup>14</sup> Parts 2 and 3 also contained the EPTs, and Parts 4 and 5 also contained the FPTs. As stated earlier, the results of these tasks were not analyzed for this dissertation.

#### 3.4.4 Participants

All participants were at least 18 years old at the time of the study. The total number of participants whose responses were analyzed was 93: 16 school bilinguals (eight females), 22 US-based heritage speakers of Arabic (17 females), 33 native speakers of American English serving as English native controls (18 females), and 22 native speakers of Palestinian or Jordanian Arabic serving as Arabic native controls (eight females). Jordanian Arabic is virtually identical to Palestinian Arabic; in the norming stage of the study, which included some native speakers of Jordanian Arabic, no differences in performance were observed between native speakers of Palestinian Arabic and native speakers of Jordanian Arabic. Of the 22 Arabic native controls who participated in the present study, only four reported spending the majority of the first 18 years of their lives in Jordan; the remaining 18 reported spending the majority of the first 18 years of their lives in Israel, Jerusalem, or Palestine.

For tasks consisting of two lists, List 1 was completed by eight school bilinguals, 11 heritage speakers, 17 English native controls, and 11 Arabic native controls, and List 2 was completed by eight school bilinguals, 11 heritage speakers, 16 English native controls, and 11 Arabic native controls.

##### *3.4.4.1 Demographic Data and Self-Rated Linguistic Proficiency*

Table 6 reports data collected in the linguistic questionnaire: demographic data, and data on participants' self-rated linguistic proficiency. Participants were asked to indicate the language that they knew best, and additionally to indicate the language(s) they knew and to rank their proficiency in them on a scale of 1-11, as follows: 1 = beginner low; 2 = beginner mid; 3 = beginner high; 4 = intermediate low; 5 = intermediate mid; 6 = intermediate high; 7 = advanced low; 8 = advanced mid; 9 = advanced high; 10 = near-native; 11 = native command. Responses

indicating varieties of English or Arabic other than American English or Palestinian Arabic, respectively, were not included in the calculation of percentages for self-rated linguistic proficiency. As shown in Table 6, of the 22 heritage speakers, who had broadly self-assessed their Palestinian Arabic proficiency as intermediate or better, 20 (91%) also rated their Arabic proficiency as intermediate or better using the 1-11 scale.

The school bilinguals had all attended Jerusalem School between 1989 and 2014. During the first 18 years of their lives, they had not resided in an English-speaking country, with the exception of five participants (31%) who had resided in the United States for some amount of time during the first 18 years of their lives: three (19%) for half a year (3% of the first 18 years of their lives), one (6%) for one year (6%), and one (6%) for three years (17%). Between the age of 18 and the time of the study, three school bilinguals (19%) had not resided in an English-speaking country, while the other 13 (81%) had resided for some amount of time in the United States and/or the United Kingdom: two participants (13%) for 1% to 25% of the time between the age of 18 and the time of the study; two (13%) for 26% to 50%; five (31%) for 51% to 75%; and four (25%) for 76% to 100%.

The Arabic native controls had not resided in an English-speaking country during the first 18 years of their lives, with the exception of four participants (18%) who had resided in the United States for some amount of time during that period: one (5%) for three fourths of a year (4% of the first 18 years of the participant's life), one (5%) for one year (6%), one (5%) for two years (11%), and one (5%) for three years (17%). Between the age of 18 and the time of the study, 11 Arabic native controls (50%) had not resided in an English-speaking country, while the other 11 (50%) had resided for some amount of time in the United States, the United Kingdom,



and/or English-speaking Canada: four participants (18%) for 1% to 25% of the time between the age of 18 and the time of the study; five (23%) for 51% to 75%; and two (9%) for 76% to 100%.

**Table 6:** Demographic Data and Self-Rated Linguistic Proficiency

		<b>SB</b>	<b>HS</b>	<b>EN</b>	<b>AR</b>
	<b>Number of Participants</b>	16	22	33	22
	<b>Mean Age</b>	28	23	43	32
<b>Gender</b>	<i>Female</i>	50%	77%	55%	36%
	<i>Male</i>	50%	23%	45%	64%
<b>Place of Birth</b>	<i>Palestine/Israel</i>	94%	9%	-	77%
	<i>USA</i>	6%	86%	97%	-
	<i>Jordan</i>	-	5%	-	14%
	<i>Other</i>	-	-	3%	9%
<b>Highest Level of Education Completed</b>	<i>High school</i>	6%	9%	-	14%
	<i>Between high school and Bachelor's</i>	25%	59%	3%	9%
	<i>Bachelor's</i>	19%	32%	9%	23%
	<i>Between Bachelor's and Master's</i>	6%	-	12%	9%
	<i>Master's</i>	44%	-	30%	27%
	<i>Between Master's and doctorate</i>	-	-	30%	14%
	<i>Doctorate</i>	-	-	15%	5%
<b>Self-Rated Best Language</b>	<i>Arabic</i>	6%	-	-	82%
	<i>English</i>	75%	100%	97%	14%
	<i>Arabic and English</i>	19%	-	-	5%
	<i>English and Spanish</i>	-	-	3%	-
<b>Self-Ratings for Arabic</b>	<i>Native command (11)</i>	62%	5%	-	91%
	<i>Near-native (10)</i>	31%	9%	-	5%
	<i>Advanced high (9)</i>	6%	5%	3%	-
	<i>Advanced mid (8)</i>	-	23%	3%	5%
	<i>Advanced low (7)</i>	-	23%	-	-
	<i>Intermediate high (6)</i>	-	9%	3%	-
	<i>Intermediate mid (5)</i>	-	14%	-	-
	<i>Intermediate low (4)</i>	-	5%	-	-
	<i>Beginner high (3)</i>	-	5%	-	-
	<i>Beginner low (2)</i>	-	5%	3%	-
	<b>Mean Self-Rating</b>	10.56	6.86	0.76	10.82
<b>Self-Ratings for English</b>	<i>Native command (11)</i>	94%	100%	100%	14%
	<i>Near-native (10)</i>	6%	-	-	27%
	<i>Advanced high (9)</i>	-	-	-	32%
	<i>Advanced mid (8)</i>	-	-	-	9%
	<i>Advanced low (7)</i>	-	-	-	14%
	<i>Intermediate high (6)</i>	-	-	-	5%
	<b>Mean Self-Rating</b>	10.94	10.95	11	9.05



Appendix G provides more details on participants' demographic data and their self-rated linguistic proficiency. Participants are identified by modified versions of the participant numbers used in the study: the prefix *EX*, which was used to distinguish experiment participants from norming participants, is omitted for the sake of simplicity.

#### *3.4.4.2 Language Use and Exposure, Socioaffective Factors, and Language Aptitude*

One part of the linguistic questionnaire targeted participants' language use and exposure. For four different linguistic activities (listening, speaking, reading, and writing), four different stages of life (from birth until the start of schooling, during kindergarten and elementary school, during middle school / junior high school and high school, and since graduating from high school), and three different settings (home, school, and outside home and school), participants were asked to indicate what percentage of their language use or exposure was in American English, (Palestinian) Arabic,<sup>15</sup> and other languages. For school bilinguals, residence in an English-speaking country after schooling was expected to entail increased use of and exposure to English, so the results of this part of the questionnaire were expected to reveal whether residence in an English-speaking country impacted individual variation in the school bilinguals' English nativelikeness.

Participants' responses were converted to decimals, and for each question, the response for Arabic was subtracted from the response for English, for a language use and exposure score for that question. For example, if the response to a question was 60% for English and 40% for Arabic, that question received a score of 0.2, and if the response to a question was 30% for English and 60% for Arabic, that question received a score of -0.3. Thus, positive scores

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<sup>15</sup> Questions about listening and speaking indicated *Palestinian Arabic*, and questions about reading and writing indicated *Arabic*. This is because for speakers of Palestinian Arabic, listening and speaking are mostly done in Palestinian Arabic, while reading and writing are mostly done in Modern Standard Arabic.

indicated greater use of or exposure to English, negative scores indicated greater use of or exposure to Arabic, and scores of 0 indicated an equal amount of use of or exposure to both languages. Participants' responses were averaged for each of the 11 categories of variables (the four linguistic activities, the four stages of life, and the three settings), for a score between -1 and 1 for each category. Additionally, the individual scores for linguistic activities, stages of life, and settings were summed for three global language use and exposure scores between -3 and 3, one each for linguistic activities, stages of life, and settings.

Another part of the linguistic questionnaire targeted socioaffective factors. It consisted of 120 statements with which participants rated their agreement or disagreement on a scale of 0-10. The questions were distributed across 12 categories of 10 questions each, depending on whether the questions were about English and the United States or Arabic and the Arab World; whether they were about social factors, personal factors, or attitudinal factors; and whether they were about the participant's experiences during school or since graduation from high school. Thus, there were three variables (language/region, type of factor, and stage of life), with two, three, and two levels, respectively, for a 2x3x2 design and a total of 12 categories. For each category, a socioaffective factor score was calculated by averaging the responses of 1-10, for a total possible score of 10 in each category. Additionally, the six individual scores for each language/region were averaged, for two global socioaffective factor scores between 0 and 10, one each for English/United States and Arabic/Arab World.

Although the native controls completed the language aptitude test, only the school bilinguals' and heritage speakers' results were analyzed. Each of the three sections of the aptitude test (LLAMA\_B, LLAMA\_E, and LLAMA\_F) consisted of 20 questions. One question in the LLAMA\_F section had to be discarded because of an error in one of the multiple-choice

responses. Language aptitude scores were calculated by giving each correct response a score of 1, so the highest possible scores were 20 for LLAMA\_B, 20 for LLAMA\_E, and 19 for LLAMA\_F. Additionally, all three individual scores were summed for a global language aptitude score between 0 and 59 for each participant.

See Appendix H for the school bilinguals' and heritage speakers' language use and exposure scores, socioaffective factor scores, and language aptitude scores.

#### *3.4.4.3 Elicited Imitation Tasks*

The EITs were scored by assigning a score of 0 or 1 for each sentence, for a total possible score of 30 for each EIT. Sentences containing a syntactic error, a semantic error, and/or a nonexistent or filler word (such as “something”) received a score of 0, as did sentences that were incomplete either for no identifiable reason or due to an identifiable inability on the part of the participant to remember them completely (as signaled through comments such as “I missed that” or “I don’t know”). Regional variations, contractions and phonological reductions, differences that did not result in a syntactic or semantic error, extraneous sounds, false starts, and self-repairs were accepted and did not trigger a score of 0.

Sentences that were missing or incomplete due to identifiable or suspected technical issues or other issues not necessarily indicating that the participant could not remember the sentences completely (namely, one participant broke into a fit of laughter midway through a sentence and did not complete it, and one participant commented that he had struggled to produce the sentence completely because it contained a lexical item that did not occur in his native dialect) were not scored. Finally, one sentence was not scored because, as reflected by the audio recording, some of the words in the sentence were supplied to the participant by a person who had evidently heard and could remember the original sentence, could tell that the participant

was struggling to remember parts of it, and supplied the missing words before the participant had a chance to either remember them or give up. Overall, nine of 2,130 English sentences (0.004%) were not scored, and 11 of 1,800 Arabic sentences (0.006%) were not scored.

See Appendix I for mean EIT scores by group and participant.

### 3.5 SUMMARY

This chapter presented a detailed description of the study's design and methodology. It described the pilot study on which the present study was based and which formed the basis for some of the hypotheses. It then presented the research questions and hypotheses and motivated the latter. It then described the instruments that were used in the study and whose results were analyzed for this dissertation. Finally, it described the four groups of participants tested, motivated their inclusion in the study, and reported participant data collected in the study: demographic data, data on self-rated language proficiency, and scores for language aptitude and exposure, socioaffective factors, language aptitude, and the Elicited Imitation Tasks. Chapter 4 will present the study results analyzed for this dissertation.

## **CHAPTER 4: RESULTS**

### **4.1 INTRODUCTION**

The goal of this study was to investigate nativelikeness and dominance in school bilinguals. As described previously, the study used a number of instruments designed to answer the research questions. In response to the research questions and hypotheses, this chapter presents the results of the study that were analyzed for this dissertation. Sections 4.2 reports and analyzes the results of the TVJTs and the GJTs, while Sections 4.3-4.5 report and analyze results for nativelikeness by participant, individual variation, and dominance, respectively. Section 4.6 summarizes the chapter.

### **4.2 TVJTS AND GJTS**

As described earlier, for each language the study included two instruments designed to measure nativelikeness: a Truth Value Judgment Task (TVJT) and a Grammaticality Judgment Task (GJT). Each TVJT consisted of two measures, testing knowledge of article semantics and verbal aspect, respectively. Each of those measures included four conditions. Each GJT consisted of three measures, testing knowledge of resumptive pronouns, double objects, and adverb word order, respectively. They included two conditions, four conditions, and six conditions, respectively. Thus, for each language, the TVJT and GJT consisted of a total of five measures and twenty conditions.

For statistical analysis, each response of TRUE was quantified as 1, and each response of FALSE was quantified as 0. For the GJTs, statistical analysis was performed using the original responses of 1-6.

## 4.2.1 Presentation of Results

### 4.2.1.1 Descriptive Statistics

Figures 1-10 present, for each of the ten measures of the TVJTs and the GJTs, group means by condition: first for the English TVJT (Figures 1 and 2), then for the English GJT (Figures 3-5), then for the Arabic TVJT (Figures 6 and 7), then for the Arabic GJT (Figures 8-10). For the TVJTs, group means range between 0 and 1. In each figure, TRUE conditions are followed by FALSE conditions: for the conditions in the left half of each figure (for example, BRT and THT in Figure 1), 1 is the expected targetlike response, and for the conditions in the right half of each figure (for example, BRF and THF in Figure 1), 0 is the expected targetlike response. For the GJTs, group means range between 1 and 6. In each figure, grammatical conditions are followed by ungrammatical conditions: for the conditions in the left half of each figure (for example, GAP in Figure 3), 6 is the expected targetlike response, and for the conditions in the right half of each figure (for example, RES in Figure 3), 1 is the expected targetlike response.

The tables in Appendix J provide more detailed descriptive statistics by language, group, and condition. For each of the TVJTs and GJTs, the tables present descriptive statistics by group and condition: for each group and condition, the mean of the participant means (the group mean), the standard deviation of the participant means, the maximum participant mean, and the minimum participant mean. For each measure, data is presented, from left to right, first for the TRUE or grammatical conditions, and then for the FALSE or ungrammatical conditions.

In the figures and tables below, the English and Arabic conditions are abbreviated as follows:

*English:*



#### Article Semantics:

BRT = bare plural, true

THT = “the”, true

BRF = bare plural, false

THF = “the”, false

#### Verbal Aspect:

PPP = present progressive, positive

PSN = present simple, negative

PPN = present progressive, negative

PSP = present simple, positive

#### Resumptive Pronouns:

GAP = gap at extraction site

RES = resumptive pronoun at extraction site

#### Double Objects:

BTH = double object construction grammatical in both English and Arabic

ENG = double object construction grammatical in English only

NTR = double object construction grammatical in neither English nor Arabic

NNS = semantically nonsensical

#### Adverb Word Order:

P1G = adverb in Position 1, grammatical

P2G = adverb in Position 2, grammatical

P4G = adverb in Position 4, grammatical

P1U = adverb in Position 1, ungrammatical

P2U = adverb in Position 2, ungrammatical

P3U = adverb in Position 3, ungrammatical

*Arabic:*

Article Semantics:

GNC = “the”, generic trait

SPC = “the”, specific trait

DEM = demonstrative, generic trait

ALL = “all”, specific trait

Verbal Aspect:

PPP = present progressive, positive

PSP = present simple, positive

PPD = present progressive, different action

PPN = present progressive, negative

Resumptive Pronouns:

RES = resumptive pronoun at extraction site

GAP = gap at extraction site

### Double Objects:

BTH = double object construction grammatical in both English and Arabic

CAU = causative verb

ENG = double object construction grammatical in English only

NTR = DOC grammatical in neither English nor Arabic

### Adverb Word Order:

P1G = adverb in Position 1, grammatical

P2G = adverb in Position 2, grammatical

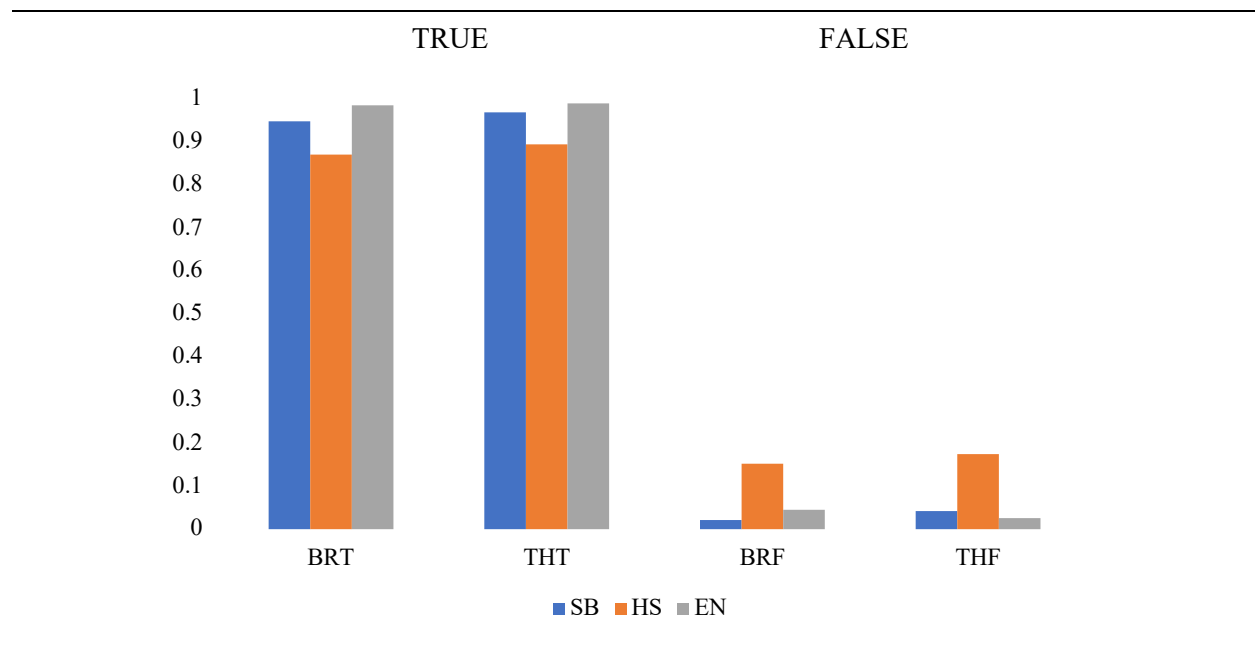
P3G = adverb in Position 3, grammatical

P3U = adverb in Position 3, ungrammatical

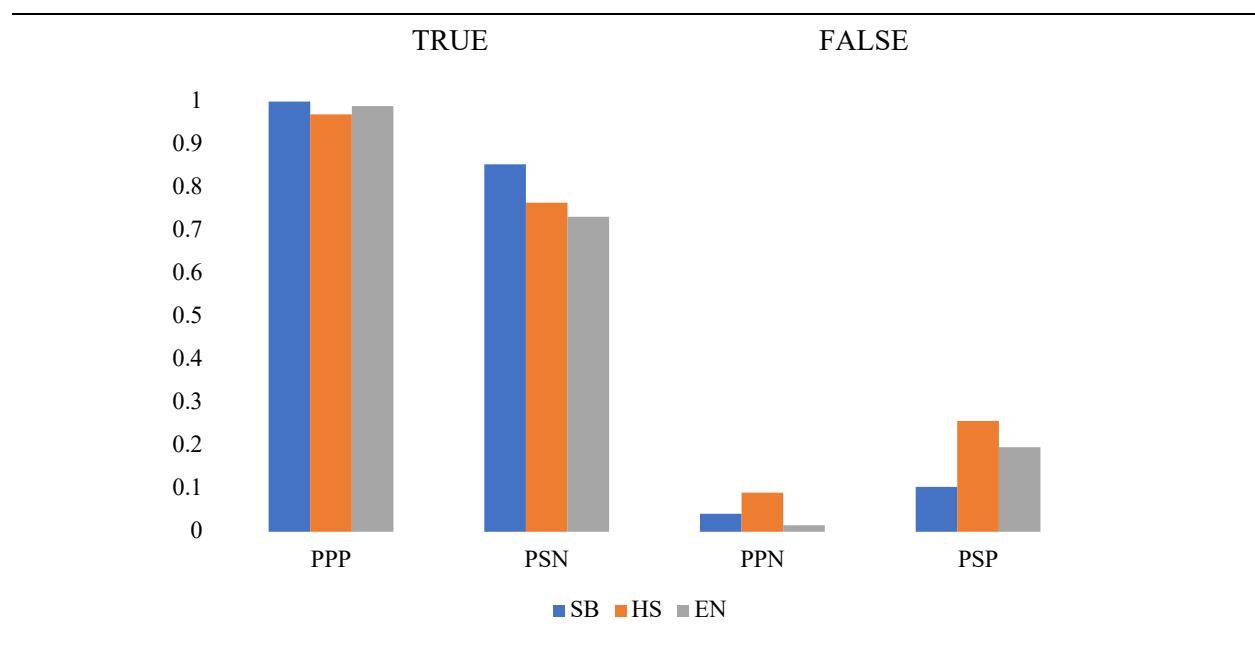
S4U = adverb in Position 4, ungrammatical, SVO order

V4U = adverb in Position 4, ungrammatical, VSO order

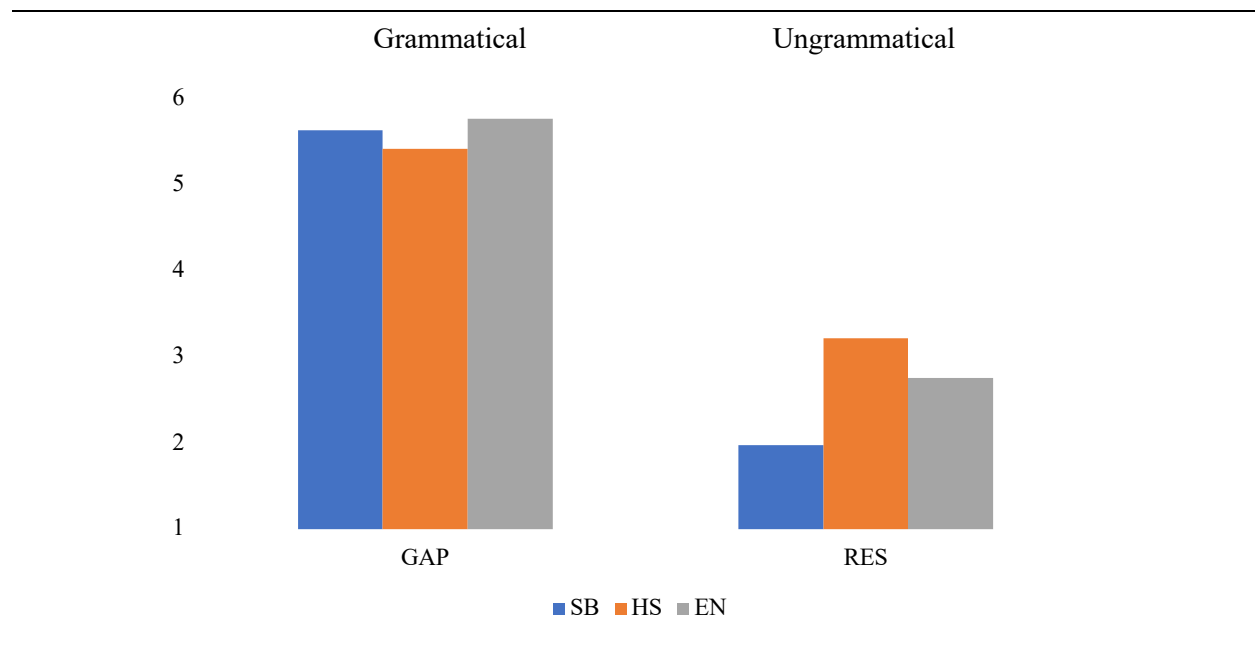
**Figure 1:** English Article Semantics: Group Means by Condition



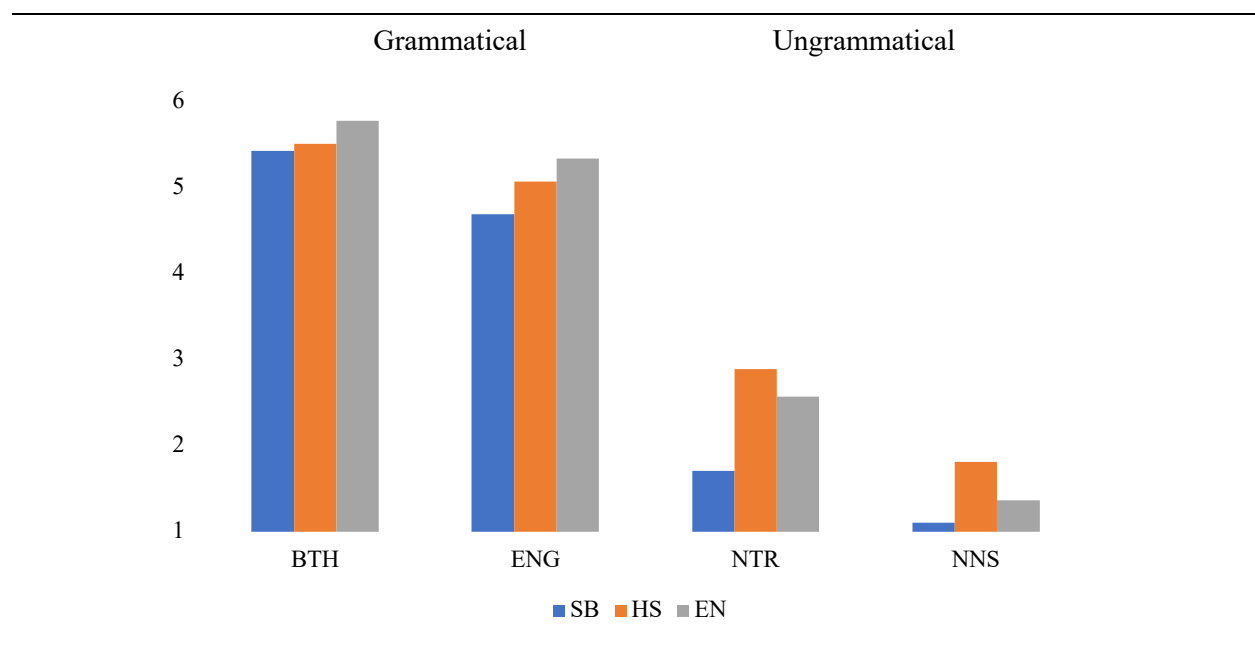
**Figure 2:** English Verbal Aspect: Group Means by Condition



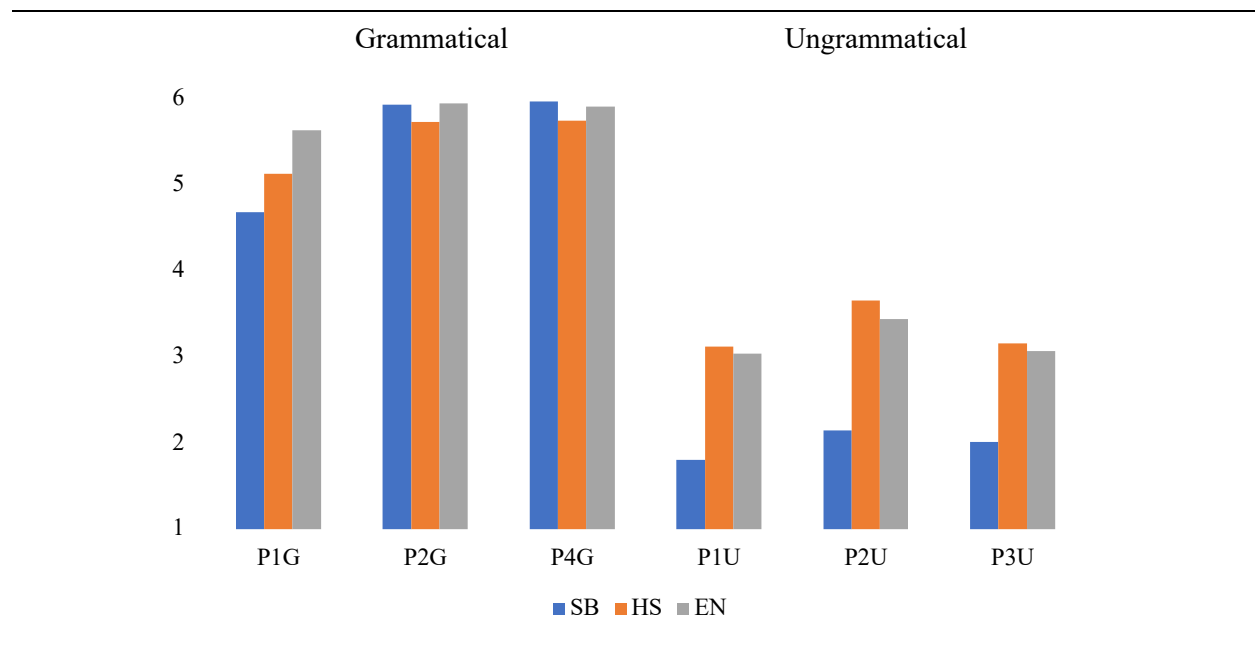
**Figure 3:** English Resumptive Pronouns: Group Means by Condition



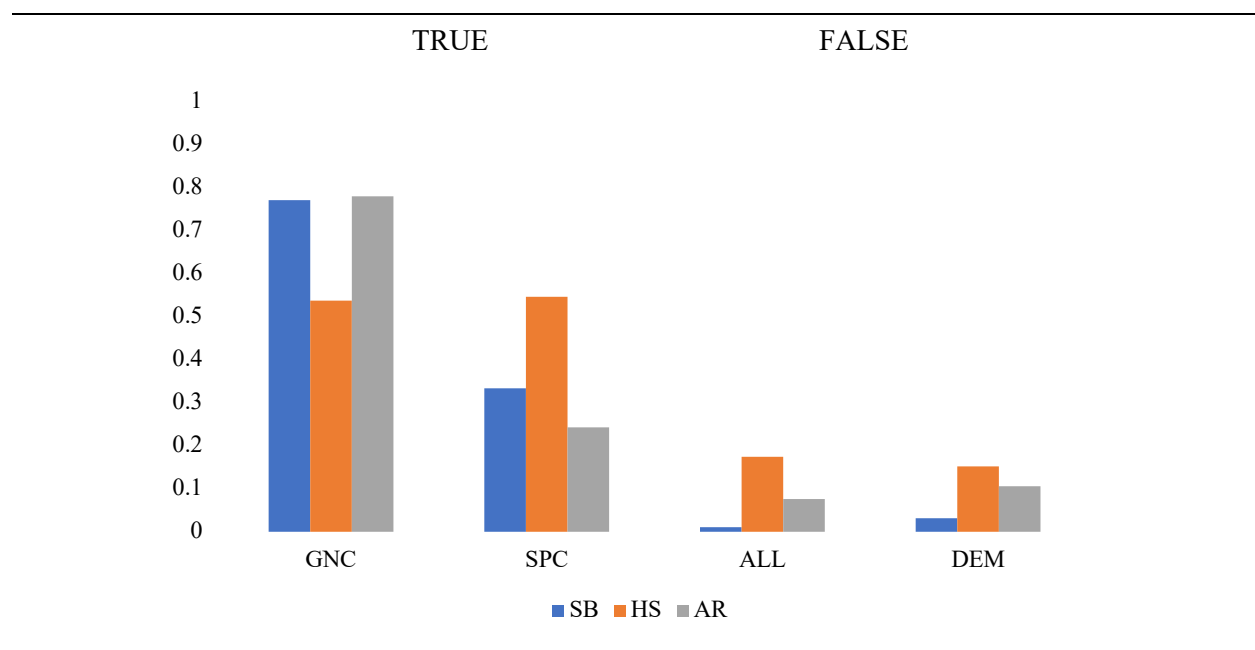
**Figure 4:** English Double Objects: Group Means by Measure and Condition



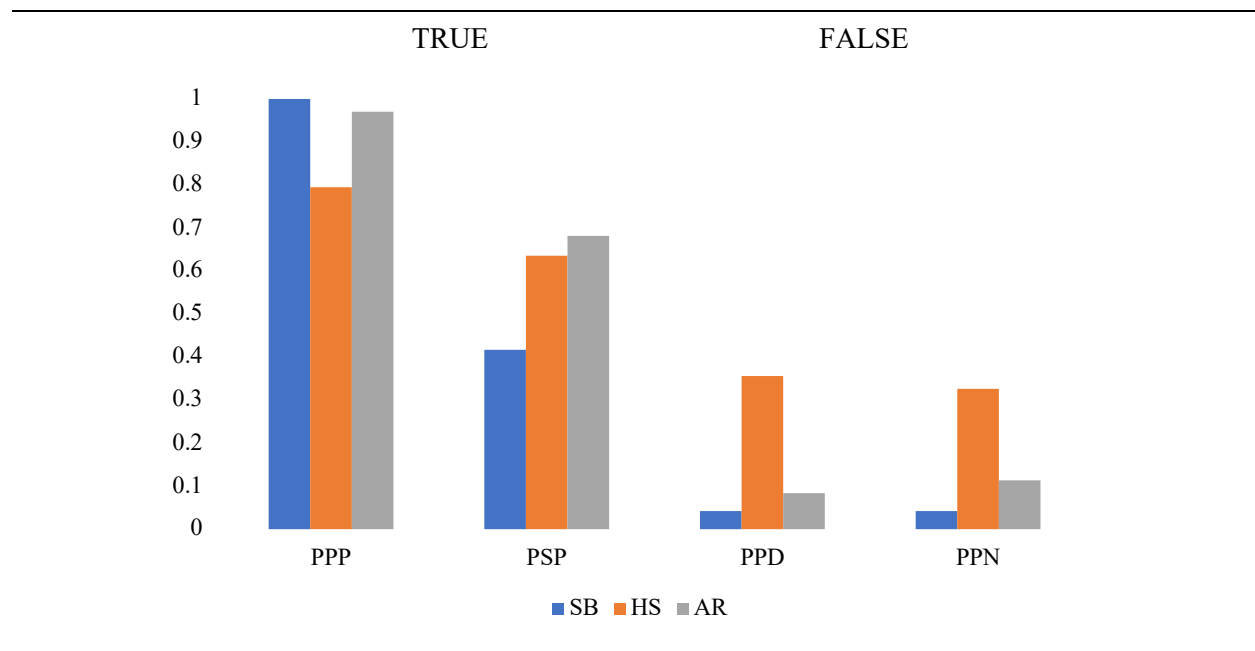
**Figure 5:** English Adverb Word Order: Group Means by Measure and Condition



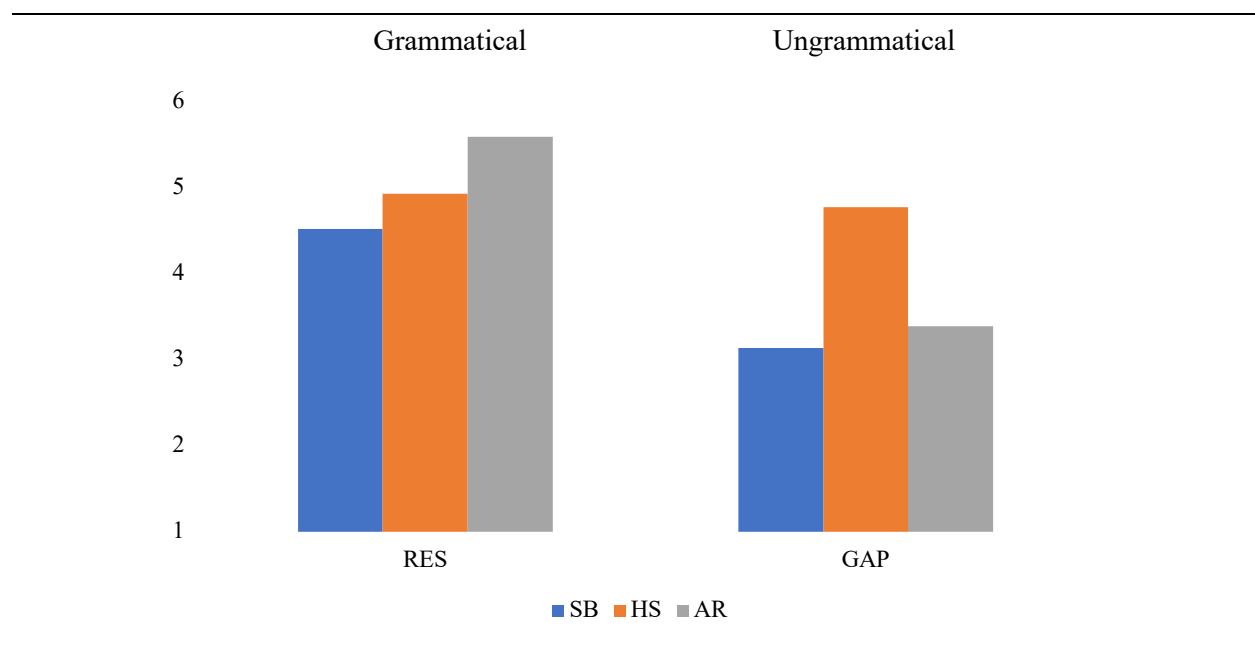
**Figure 6:** Arabic Article Semantics: Group Means by Measure and Condition



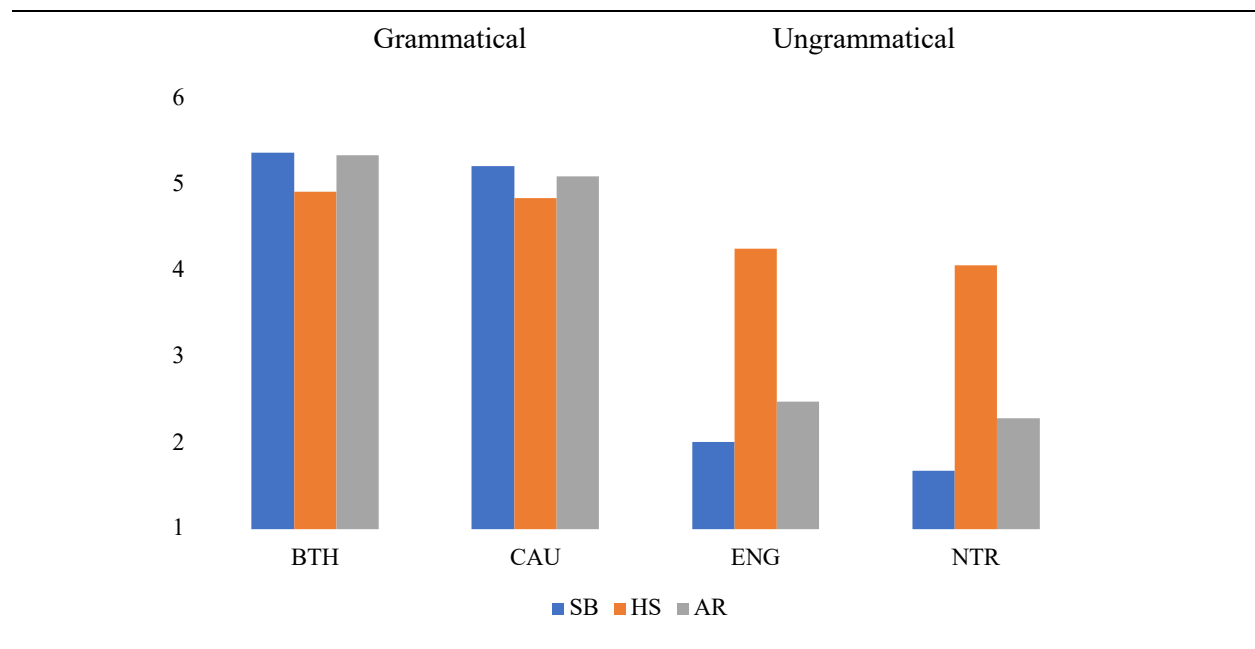
**Figure 7:** Arabic Verbal Aspect: Group Means by Condition



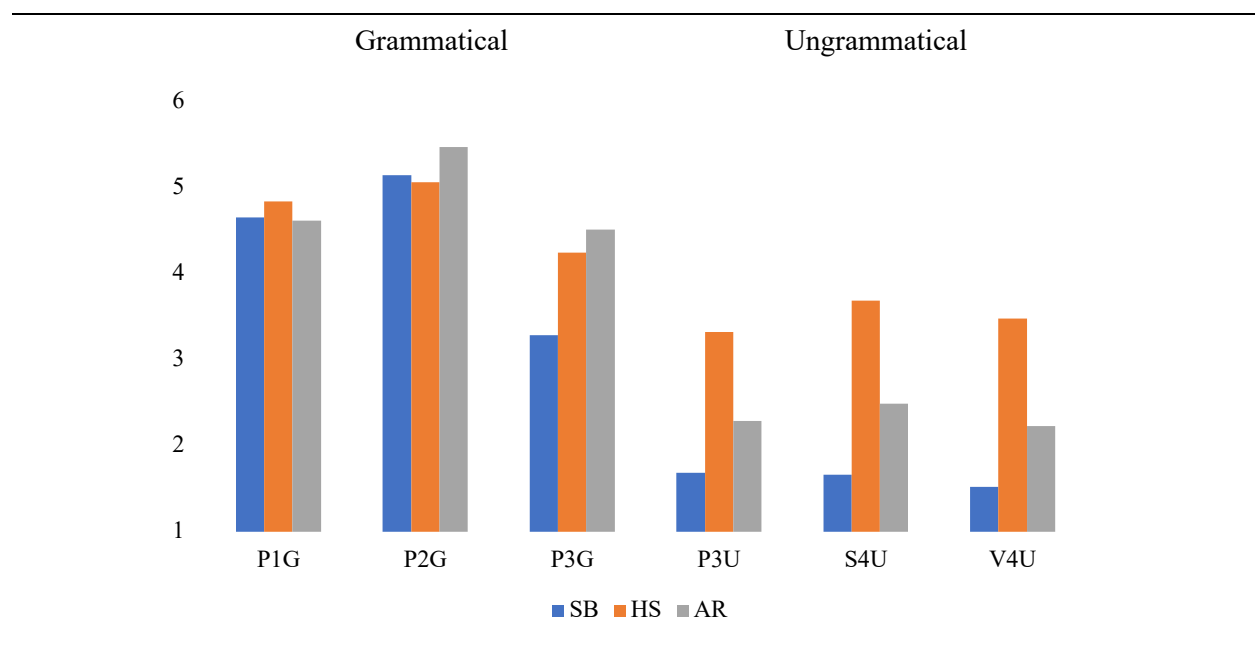
**Figure 8:** Arabic Resumptive Pronouns: Group Means by Condition



**Figure 9:** Arabic Double Objects: Group Means by Condition



**Figure 10:** Arabic Adverb Word Order: Group Means by Condition





#### 4.2.1.2 Summary of Descriptive Statistics

In this section, I give a summary of the descriptive statistics. On the TVJTs, I consider means between 0.90 and 1.00 on TRUE conditions and between 0.00 and 0.09 on FALSE conditions to be *at ceiling*, and means between 0.80 and 0.89 on TRUE conditions and between 0.10 and 0.19 on FALSE conditions to be *almost at ceiling*. On the GJTs, I consider means between 5.50 and 6.00 on grammatical conditions and between 1.00 and 1.49 on ungrammatical conditions to be *at ceiling*; means between 5.00 and 5.49 on grammatical conditions and between 1.50 and 1.99 on ungrammatical conditions to be *almost at ceiling*; means between 4.50 and 4.99 on grammatical conditions and between 2.00 and 2.49 on ungrammatical conditions to be *relatively high but not at ceiling*; means between 4.00 and 4.49 on grammatical conditions and between 2.50 and 2.99 on ungrammatical conditions to be *well below ceiling but well on the target side of the 3.5 midpoint*; and means between 3.51 and 3.99 on grammatical conditions and between 3.00 and 3.49 on ungrammatical conditions to be *only barely on the target side of the 3.5 midpoint*. As will be discussed in later sections, five of the TVJT conditions—PSP and PSP on the English TVJT, and GNC, SPC, and PSP on the Arabic TVJT—differ from the other TVJT conditions in a crucial way that bears on the interpretation of the results.

On the English article semantics measure, the school bilinguals and the native controls were at ceiling on all four conditions, while the heritage speakers were almost at ceiling on all four conditions. On the English verbal aspect measure, all three groups were at ceiling on the PPP and PPN conditions, while on the PSN and PSP conditions, none of the groups were at ceiling: the school bilinguals were almost at ceiling, while the other two groups performed relatively high but not at ceiling.

On the English resumptive pronouns measure, all three groups were at ceiling or almost at ceiling on the GAP condition, while on the RES condition none of the groups were at ceiling: the school bilinguals were almost at ceiling, and the other two groups were well below ceiling but well on the target side of the 3.5 midpoint. On the English double objects measure, each group was at ceiling or almost at ceiling on all but one of the four conditions: on the ENG condition, the school bilinguals performed relatively high but not at ceiling on the ENG condition, and on the NTR condition, the other two groups performed well below ceiling but well on the target side of the 3.5 midpoint. On the English adverb word order measure, all three groups performed at ceiling or almost at ceiling on all three grammatical conditions, with the exception of the school bilinguals' performance on P1G, which was relatively high but not at ceiling. On the ungrammatical conditions, the school bilinguals performed almost at ceiling on P1U and relatively high but not at ceiling on P2U and P3U, and the other two groups performed barely on the target side of the 3.5 midpoint on all three conditions, with the exception of the heritage speakers' performance on P2U, which was not on the target side of the 3.5 midpoint.

On the Arabic article semantics measure, all three groups performed at ceiling or almost at ceiling on the FALSE conditions, while on the TRUE conditions none of the groups performed at ceiling: on both conditions, the heritage speakers were barely on the target side of the 3.5 midpoint, while on GNC, the school bilinguals and the native controls performed relatively high but not at ceiling, and on SPC, they were not on the target side of the 3.5 midpoint. On the Arabic verbal aspect measure, the school bilinguals and the native controls performed at ceiling or almost at ceiling on all conditions except for PSP; on PSP, the school bilinguals' performance was not on the target side of the 3.5 midpoint, while the native controls' performance was well below ceiling but well on the target side of the 3.5 midpoint. The heritage speakers performed

almost at ceiling on PPP, while on the other three conditions their performance was well below ceiling but well on the target side of the 3.5 midpoint.

On the Arabic resumptive pronouns measure, the native controls were at ceiling on RES, while the other two groups performed relatively high but not at ceiling on that condition. On GAP, the school bilinguals and the native controls were barely on the target side of the 3.5 midpoint, while the heritage speakers were not on the target side of the 3.5 midpoint. On the Arabic double objects measure, the school bilinguals were almost at ceiling on all but one condition: ENG, on which they performed relatively high but not at ceiling. The native controls had the same pattern with the exception of NTR, on which they performed relatively high but not at ceiling. The heritage speakers performed relatively high but not at ceiling on the grammatical conditions, while on the ungrammatical conditions, they were not on the target side of the 3.5 midpoint. On the Arabic adverb word order measure, the school bilinguals were almost at ceiling on all but two conditions: P1G, on which they performed relatively high but not at ceiling, and P3G, on which they were not on the target side of the 3.5 midpoint. The native controls performed almost at ceiling on P2G; on all other conditions, they performed relatively high but not at ceiling. The heritage speakers had a mixed pattern: on P2G, they were almost at ceiling; on P1G, they performed relatively high but not at ceiling; on P3G, they performed well below ceiling but well on the target side of the 3.5 midpoint; on P3U and V4U, they were barely on the targets die of the 3.5 midpoint; and on S3U, they were not on the target side of the 3.5 midpoint.

#### *4.2.1.3 Mixed Models*

For each TVJT, a linear mixed model was run using the lmer function from the lme4 package in R, as well as the afex package; with response (quantified as 0 or 1) as the dependent

variable, group and condition as fixed effects, and subject<sup>16</sup> and token set as random effects. The following formula was used for each model:<sup>17</sup>

$$\text{response} \sim \text{group} * \text{condition} + (1 \mid \text{subject}) + (1 \mid \text{token\_set})$$

For each model, the factor group had three levels (one for each group that completed the task), and the factor condition had eight levels (one for each condition within the respective TVJT).

The mixed model outputs are given in Tables 7 and 8.<sup>18</sup>

---

<sup>16</sup> In the dataset, *subject* was the term used to refer to a participant. In this dissertation, I use the term *participant* to refer to the same thing.

<sup>17</sup> For the English TVJT, the model output indicated a singular fit and almost no random effect of subject (variance = 7.784e-12), suggesting that the model was overfitted due to the inclusion of subject as a random effect. To check whether the inclusion of subject had affected any of the p-values, the model was re-run without subject as a random effect. The p-values remained unchanged.

<sup>18</sup> As indicated in the model outputs, the names of the datasets used were *EN\_TVJT* and *AR\_TVJT* for English and Arabic, respectively, and the correlation matrix for each model was not shown by default.

**Table 7: Linear Mixed Model Output for English TVJT**

---

```

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest']
Formula: response ~ group * condition + (1 | subject) + (1 | token_set)
Data: EN_TVJT

REML criterion at convergence: 993.1

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.6378 -0.2668 -0.0153  0.1947  3.6161

Random effects:
   Groups      Name                Variance Std.Dev.
subject  (Intercept)  7.784e-12  2.790e-06
token_set (Intercept) 1.686e-03  4.106e-02
Residual                        7.490e-02  2.737e-01
Number of obs: 3408, groups:  subject, 71; token_set, 48

Fixed effects:
              Estimate Std. Error      df t value Pr(>|t|)
(Intercept)    4.588e-02  2.278e-02  2.209e+02   2.014  0.04519 *
groupHS         1.056e-01  3.075e-02  3.340e+03   3.435  0.00060 ***
groupSB        -2.505e-02  3.404e-02  3.340e+03  -0.736  0.46187
conditionEN-TVJT-R-BRT  9.387e-01  3.221e-02  2.209e+02  29.143 < 2e-16 ***
conditionEN-TVJT-R-THF -2.020e-02  2.751e-02  3.340e+03  -0.734  0.46271
conditionEN-TVJT-R-THT  9.438e-01  3.221e-02  2.209e+02  29.300 < 2e-16 ***
conditionEN-TVJT-S-PPN -3.013e-02  3.221e-02  2.209e+02  -0.935  0.35059
conditionEN-TVJT-S-PPP  9.434e-01  3.221e-02  2.209e+02  29.287 < 2e-16 ***
conditionEN-TVJT-S-PSN  6.858e-01  3.221e-02  2.209e+02  21.290 < 2e-16 ***
conditionEN-TVJT-S-PSP  1.517e-01  3.221e-02  2.209e+02   4.709  4.39e-06 ***
groupHS:conditionEN-TVJT-R-BRT -2.190e-01  4.349e-02  3.340e+03  -5.037  4.99e-07 ***
groupSB:conditionEN-TVJT-R-BRT -1.166e-02  4.813e-02  3.340e+03  -0.242  0.80856
groupHS:conditionEN-TVJT-R-THF  4.293e-02  4.349e-02  3.340e+03   0.987  0.32366
groupSB:conditionEN-TVJT-R-THF  4.104e-02  4.813e-02  3.340e+03   0.853  0.39398
groupHS:conditionEN-TVJT-R-THT -2.014e-01  4.349e-02  3.340e+03  -4.630  3.79e-06 ***
groupSB:conditionEN-TVJT-R-THT  4.119e-03  4.813e-02  3.340e+03   0.086  0.93181
groupHS:conditionEN-TVJT-S-PPN -3.047e-02  4.349e-02  3.340e+03  -0.701  0.48353
groupSB:conditionEN-TVJT-S-PPN  5.097e-02  4.813e-02  3.340e+03   1.059  0.28977
groupHS:conditionEN-TVJT-S-PPP -1.252e-01  4.349e-02  3.340e+03  -2.879  0.00402 **
groupSB:conditionEN-TVJT-S-PPP  3.580e-02  4.813e-02  3.340e+03   0.744  0.45713
groupHS:conditionEN-TVJT-S-PSN -7.216e-02  4.349e-02  3.340e+03  -1.659  0.09718 .
groupSB:conditionEN-TVJT-S-PSN  1.475e-01  4.813e-02  3.340e+03   3.065  0.00219 **
groupHS:conditionEN-TVJT-S-PSP -4.563e-02  4.349e-02  3.340e+03  -1.049  0.29420
groupSB:conditionEN-TVJT-S-PSP -6.835e-02  4.813e-02  3.340e+03  -1.420  0.15569
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation matrix not shown by default, as p = 24 > 12.
Use print(x, correlation=TRUE) or
    vcov(x)          if you need it

optimizer (nloptwrap) convergence code: 0 (OK)
boundary (singular) fit: see ?isSingular

```

---

**Table 8: Linear Mixed Model Output for Arabic TVJT**


---

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest']					
Formula: response ~ group * condition + (1   subject) + (1   token_set)					
Data: AR_TVJT					
REML criterion at convergence: 2632.2					
Scaled residuals:					
Min	1Q	Median	3Q	Max	
-3.3150	-0.5410	-0.1227	0.6266	2.6949	
Random effects:					
Groups	Name	Variance	Std.Dev.		
subject	(Intercept)	0.004717	0.06868		
token_set	(Intercept)	0.002168	0.04656		
Residual		0.137245	0.37047		
Number of obs: 2880, groups: subject, 60; token_set, 48					
Fixed effects:					
	Estimate	Std. Error	df	t value	Pr(> t )
(Intercept)	7.576e-02	3.788e-02	3.773e+02	2.000	0.046216 *
groupHS	9.849e-02	5.008e-02	6.598e+02	1.966	0.049667 *
groupSB	-6.534e-02	5.458e-02	6.598e+02	-1.197	0.231645
conditionAR-TVJT-R-DEM	3.030e-02	4.560e-02	2.755e+03	0.665	0.506412
conditionAR-TVJT-R-GNC	7.045e-01	4.940e-02	4.366e+02	14.261	< 2e-16 ***
conditionAR-TVJT-R-SPC	1.667e-01	4.940e-02	4.366e+02	3.374	0.000808 ***
conditionAR-TVJT-S-PPD	7.576e-03	4.940e-02	4.366e+02	0.153	0.878199
conditionAR-TVJT-S-PPN	3.788e-02	4.940e-02	4.366e+02	0.767	0.443668
conditionAR-TVJT-S-PPP	8.939e-01	4.940e-02	4.366e+02	18.094	< 2e-16 ***
conditionAR-TVJT-S-PSP	6.061e-01	4.940e-02	4.366e+02	12.267	< 2e-16 ***
groupHS:conditionAR-TVJT-R-DEM	-5.303e-02	6.449e-02	2.755e+03	-0.822	0.410975
groupSB:conditionAR-TVJT-R-DEM	-9.470e-03	7.028e-02	2.755e+03	-0.135	0.892820
groupHS:conditionAR-TVJT-R-GNC	-3.409e-01	6.449e-02	2.755e+03	-5.286	1.35e-07 ***
groupSB:conditionAR-TVJT-R-GNC	5.587e-02	7.028e-02	2.755e+03	0.795	0.426669
groupHS:conditionAR-TVJT-R-SPC	2.045e-01	6.449e-02	2.755e+03	3.172	0.001532 **
groupSB:conditionAR-TVJT-R-SPC	1.562e-01	7.028e-02	2.755e+03	2.223	0.026272 *
groupHS:conditionAR-TVJT-S-PPD	1.742e-01	6.449e-02	2.755e+03	2.702	0.006938 **
groupSB:conditionAR-TVJT-S-PPD	2.367e-02	7.028e-02	2.755e+03	0.337	0.736238
groupHS:conditionAR-TVJT-S-PPN	1.136e-01	6.449e-02	2.755e+03	1.762	0.078167 .
groupSB:conditionAR-TVJT-S-PPN	-6.629e-03	7.028e-02	2.755e+03	-0.094	0.924858
groupHS:conditionAR-TVJT-S-PPP	-2.727e-01	6.449e-02	2.755e+03	-4.229	2.42e-05 ***
groupSB:conditionAR-TVJT-S-PPP	9.564e-02	7.028e-02	2.755e+03	1.361	0.173634
groupHS:conditionAR-TVJT-S-PSP	-1.439e-01	6.449e-02	2.755e+03	-2.232	0.025697 *
groupSB:conditionAR-TVJT-S-PSP	-1.998e-01	7.028e-02	2.755e+03	-2.843	0.004499 **
---					
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Correlation matrix not shown by default, as p = 24 > 12.					
Use print(x, correlation=TRUE) or					
vcov(x) if you need it					

---

For each GJT, a cumulative link mixed model was run using the `clmm` function from the `ordinal` package in R, as well as the `afex` package; with `response` as the dependent variable, `group` and `condition` as fixed effects, and `subject` and `token_set` as random effects. The following formula was used for each model:

```
response ~ group * condition + (1 | subject) + (1 | token_set)
```

For each model, the factor `group` had three levels (one for each group that completed the task), and the factor `condition` had twelve levels (one for each condition within the respective GJT).

The mixed model outputs are given in Tables 9 and 10.<sup>19</sup>

---

<sup>19</sup> As indicated in the model outputs, the names of the datasets used were *EN\_GJT* and *AR\_GJT* for English and Arabic, respectively.

**Table 9:** Cumulative Link Mixed Model Output for English GJT

```
Cumulative Link Mixed Model fitted with the Laplace approximation

formula: response ~ group * condition + (1 | subject) + (1 | token_set)
data:      EN_GJT

link threshold nobs logLik   AIC      niter      max.grad cond.H
logit flexible  5112 -5030.69 10145.38 7927(39294) 1.26e-03 2.0e+03

Random effects:
Groups      Name      Variance Std.Dev.
token_set (Intercept) 0.2598   0.5097
subject   (Intercept) 2.1050   1.4509
Number of groups: token_set 72, subject 71

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
groupHS      -0.96771    0.47608  -2.033 0.042087 *
groupSB      -2.22305    0.51821  -4.290 1.79e-05 ***
conditionEN-GJT-A-P1U -4.84101    0.30586 -15.828 < 2e-16 ***
conditionEN-GJT-A-P2G  2.66373    0.45824  5.813 6.14e-09 ***
conditionEN-GJT-A-P2U -4.23725    0.30285 -13.991 < 2e-16 ***
conditionEN-GJT-A-P3U -4.79356    0.30419 -15.758 < 2e-16 ***
conditionEN-GJT-A-P4G  2.06766    0.37683  5.487 4.09e-08 ***
conditionEN-GJT-D-BTH  0.86747    0.34686  2.501 0.012387 *
conditionEN-GJT-D-ENG -0.56552    0.31552  -1.792 0.073082 .
conditionEN-GJT-D-NNS -8.28579    0.34440 -24.059 < 2e-16 ***
conditionEN-GJT-D-NTR -5.56006    0.30899 -17.994 < 2e-16 ***
conditionEN-GJT-R-GAP  0.58745    0.33732  1.742 0.081595 .
conditionEN-GJT-R-RES -5.22963    0.30703 -17.033 < 2e-16 ***
groupHS:conditionEN-GJT-A-P1U 1.15557    0.32498  3.556 0.000377 ***
groupSB:conditionEN-GJT-A-P1U -0.25013    0.36851  -0.679 0.497301
groupHS:conditionEN-GJT-A-P2G -0.29124    0.57799  -0.504 0.614339
groupSB:conditionEN-GJT-A-P2G  2.30563    0.75365  3.059 0.002219 **
groupHS:conditionEN-GJT-A-P2U  1.34175    0.32559  4.121 3.77e-05 ***
groupSB:conditionEN-GJT-A-P2U -0.07645    0.35830  -0.213 0.831043
groupHS:conditionEN-GJT-A-P3U  1.14587    0.32260  3.552 0.000382 ***
groupSB:conditionEN-GJT-A-P3U  0.25920    0.35856  0.723 0.469750
groupHS:conditionEN-GJT-A-P4G  0.06039    0.50494  0.120 0.904809
groupSB:conditionEN-GJT-A-P4G  3.24640    0.76774  4.229 2.35e-05 ***
groupHS:conditionEN-GJT-D-BTH  0.16028    0.40395  0.397 0.691522
groupSB:conditionEN-GJT-D-BTH  1.37732    0.43934  3.135 0.001719 **
groupHS:conditionEN-GJT-D-ENG  0.56831    0.36132  1.573 0.115743
groupSB:conditionEN-GJT-D-ENG  0.89167    0.38723  2.303 0.021297 *
groupHS:conditionEN-GJT-D-NNS  2.12052    0.36852  5.754 8.71e-09 ***
groupSB:conditionEN-GJT-D-NNS  0.09087    0.56318  0.161 0.871819
groupHS:conditionEN-GJT-D-NTR  1.44739    0.33268  4.351 1.36e-05 ***
groupSB:conditionEN-GJT-D-NTR  0.06500    0.38018  0.171 0.864243
groupHS:conditionEN-GJT-R-GAP  0.29204    0.38959  0.750 0.453489
groupSB:conditionEN-GJT-R-GAP  1.94222    0.43268  4.489 7.16e-06 ***
groupHS:conditionEN-GJT-R-RES  1.65056    0.32868  5.022 5.12e-07 ***
groupSB:conditionEN-GJT-R-RES  0.48827    0.36673  1.331 0.183060
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Threshold coefficients:
      Estimate Std. Error z value
1|2  -6.9067    0.3567 -19.363
2|3  -5.5837    0.3525 -15.839
3|4  -4.1697    0.3484 -11.968
4|5  -2.6143    0.3433  -7.616
5|6  -1.3253    0.3399  -3.899
```



**Table 10:** Cumulative Link Mixed Model Output for Arabic GJT

Cumulative Link Mixed Model fitted with the Laplace approximation

formula: response ~ group \* condition + (1 | subject) + (1 | token\_set)

data: AR\_GJT

link	threshold	nobs	logLik	AIC	niter	max.grad	cond.H
logit	flexible	4320	-5539.54	11163.07	9078(36316)	3.13e-03	2.5e+03

Random effects:

Groups	Name	Variance	Std.Dev.
token_set	(Intercept)	0.09565	0.3093
subject	(Intercept)	1.61179	1.2696

Number of groups: token\_set 72, subject 60

Coefficients:

	Estimate	Std. Error	z value	Pr(> z )	
groupHS	0.49122	0.45115	1.089	0.276236	
groupSB	0.02241	0.49560	0.045	0.963940	
conditionAR-GJT-A-P2G	1.80764	0.26319	6.868	6.51e-12	***
conditionAR-GJT-A-P3G	-0.29396	0.22988	-1.279	0.200985	
conditionAR-GJT-A-P3U	-3.43789	0.26569	-12.939	< 2e-16	***
conditionAR-GJT-A-S4U	-3.22261	0.26645	-12.095	< 2e-16	***
conditionAR-GJT-A-V4U	-3.63466	0.26797	-13.564	< 2e-16	***
conditionAR-GJT-D-BTH	1.71207	0.29467	5.810	6.24e-09	***
conditionAR-GJT-D-CAU	1.20843	0.28869	4.186	2.84e-05	***
conditionAR-GJT-D-ENG	-3.18623	0.26815	-11.882	< 2e-16	***
conditionAR-GJT-D-NTR	-3.57774	0.27129	-13.188	< 2e-16	***
conditionAR-GJT-R-GAP	-1.87245	0.26314	-7.116	1.11e-12	***
conditionAR-GJT-R-RES	2.13293	0.29897	7.134	9.72e-13	***
groupHS:conditionAR-GJT-A-P2G	-1.37652	0.35721	-3.854	0.000116	***
groupSB:conditionAR-GJT-A-P2G	-0.68599	0.40010	-1.715	0.086427	.
groupHS:conditionAR-GJT-A-P3G	-0.73381	0.32480	-2.259	0.023866	*
groupSB:conditionAR-GJT-A-P3G	-1.78685	0.36754	-4.862	1.16e-06	***
groupHS:conditionAR-GJT-A-P3U	1.05754	0.32083	3.296	0.000980	***
groupSB:conditionAR-GJT-A-P3U	-1.44900	0.38277	-3.786	0.000153	***
groupHS:conditionAR-GJT-A-S4U	1.28304	0.32262	3.977	6.98e-05	***
groupSB:conditionAR-GJT-A-S4U	-1.73447	0.38412	-4.515	6.32e-06	***
groupHS:conditionAR-GJT-A-V4U	1.38956	0.32324	4.299	1.72e-05	***
groupSB:conditionAR-GJT-A-V4U	-1.65732	0.39061	-4.243	2.21e-05	***
groupHS:conditionAR-GJT-D-BTH	-1.51220	0.35809	-4.223	2.41e-05	***
groupSB:conditionAR-GJT-D-BTH	0.15861	0.42168	0.376	0.706813	
groupHS:conditionAR-GJT-D-CAU	-1.27026	0.35059	-3.623	0.000291	***
groupSB:conditionAR-GJT-D-CAU	0.24273	0.40836	0.594	0.552233	
groupHS:conditionAR-GJT-D-ENG	2.21947	0.33070	6.711	1.93e-11	***
groupSB:conditionAR-GJT-D-ENG	-1.17611	0.37923	-3.101	0.001926	**
groupHS:conditionAR-GJT-D-NTR	2.24580	0.32991	6.807	9.94e-12	***
groupSB:conditionAR-GJT-D-NTR	-1.41603	0.38845	-3.645	0.000267	***
groupHS:conditionAR-GJT-R-GAP	1.75079	0.33018	5.303	1.14e-07	***
groupSB:conditionAR-GJT-R-GAP	-0.47864	0.36676	-1.305	0.191882	
groupHS:conditionAR-GJT-R-RES	-1.86760	0.36367	-5.135	2.81e-07	***
groupSB:conditionAR-GJT-R-RES	-1.90933	0.40637	-4.699	2.62e-06	***

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Threshold coefficients:

	Estimate	Std. Error	z value
1 2	-4.0832	0.3388	-12.051
2 3	-3.0236	0.3358	-9.004
3 4	-1.6287	0.3332	-4.888
4 5	-0.3626	0.3318	-1.093
5 6	0.7629	0.3319	2.299

For each model, pairwise comparisons were run using the `enmeans` function from the `enmeans` package, to test for significant interactions between group and condition. To reduce the Type I error rate, the pairwise comparisons for each model were run with a p-value adjustment using a multivariate method for the total number of tests run. For each model, the following two lines of code were run, where *model\_1* was the name of the model:

```
EMM <- emmeans(model_1, pairwise ~ group | condition)
test(EMM$contrasts, by = NULL, adjust = "mvt")
```

The tables in Appendix K report the results of the pairwise comparison. For each comparison, the contrast output is given as generated by the model. The final column in each table indicates whether each difference was statistically significant based on an alpha level of 0.05. For the linear mixed models that were run for the TVJTs, the degrees of freedom were approximated using the Kenward-Roger approximation method.<sup>20</sup> The cumulative link mixed models that were run for the GJTs had infinite degrees of freedom.

## 4.2.2 Analysis by Group

### 4.2.2.1 Truth Value Judgment Tasks (TVJTs)

On the English TVJT, the native controls' means were at ceiling (close to 1 for TRUE conditions and close to 0 for FALSE conditions) for six out of eight conditions. For these six conditions, each sentence had only one plausible reading and thus only one truth value that a prototypical native speaker would be expected to assign, so the native controls' performance was as expected. On the article semantics measure, sentences included either bare plurals or plurals with the definite article, which, in English, unambiguously encode genericity and specificity,

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<sup>20</sup> For the English TVJT, degrees of freedom were initially disabled because the number of observations (3408) exceeded 3000. To enable adjustments, the following two lines of code were run:

```
emm_options(lmerTest.limit = 3408)
emm_options(pbkrtest.limit = 3408)
```

respectively. On the verbal aspect measure, PPP and PPN consisted of sentences with the present progressive, whose truth value was entirely unambiguous. In PPP, the ongoing action from the story was described as in fact ongoing (TRUE), and in PPN, it was negated (FALSE).

On the other two conditions, PSN and PSP, the native controls' means were not at ceiling; they had a mean of 0.73 for PSN (a TRUE condition) and a mean of 0.2 for PSP (a FALSE condition). Unlike the six single-reading conditions, these two conditions did allow, for each sentence, a reading that differed from the target reading and prompted the opposite truth value. The sentences in these conditions used the present simple to refer to the action that was an ongoing action in the story but was not one of the person's regular activities. In the PSP condition, the statement was positive, and the target response was FALSE; and in the PSN condition, the statement was negative, and the target response was TRUE. However, the statements in these conditions were, to a certain extent, subject to interpretation. After all, if Samantha does not regularly play chess but is playing chess right now, it is conceivable to claim that Samantha does in fact play chess (albeit very infrequently) since she is doing so right now. Additionally, the wording in the story was intended to avoid using either of the targeted verb forms while still expressing the intended reality. For example, the story about Samantha and chess said that she "normally hates playing chess and it's not one of her regular activities." A native speaker could plausibly reason, "She *normally* hates it, but that doesn't necessarily mean she *always* hates it, and it's not one of her *regular* activities, which doesn't mean she *never* does it." This haziness is probably what explains the native controls' below-ceiling performance. It would probably be worthwhile to consider ways to refine the stimuli in similar studies in the future to minimize ambiguity.

The same pattern was observed for the Arabic TVJT. The native controls' means were at ceiling (close to 1 for TRUE conditions and close to 0 for FALSE conditions) for five out of eight conditions. For these five conditions, each sentence had only one plausible reading and thus only one truth value that a prototypical native speaker would be expected to assign, so the native controls' performance was as expected. On the article semantics measure, sentences in the ALL condition claimed that all the members of a class of animals exhibited a trait that they did not in fact exhibit, and sentences in the DEM condition claimed that "these" members of the class (i.e., the ones described in the story) exhibited a trait that they did not in fact exhibit. On the verbal aspect measure, PPP, PPD, and PPN consisted of sentences with the present progressive, whose truth value was entirely unambiguous. In PPP, the ongoing action was described as in fact ongoing (TRUE), in PPD, a different action incompatible with the ongoing action from the story was described as ongoing (FALSE), and in PPN, the ongoing action was negated (FALSE).

On the other three conditions, GNC, SPC, and PSP, the native controls' means were not at ceiling; they had a mean of 0.78 for GNC, 0.24 for SPC, and 0.68 for PSP (all TRUE conditions). Unlike the five single-reading conditions, these three conditions did allow, for each sentence, a reading that differed from the target reading and prompted the opposite truth value. In the GNC condition, sentences made a true claim about the generic class, and in the SPC condition, sentences made a true claim about the unusual group described in the story. Because the definite article in Arabic can refer either to a generic class or a specific group, the sentences in these conditions could be judged as true or false depending on how the definite article is interpreted. The native controls' means of 0.78 for GNC and 0.24 for SPC suggest that they strongly preferred the generic reading of the definite article in these two conditions, a pattern that has also been observed for Spanish (Montrul & Ionin, 2012), a language that behaves like Arabic

with regard to the structures tested in this study. In the PSP condition, Arabic sentences used the present simple tense to describe the ongoing action described in the story. Because the present simple tense can refer either to a habitual action or an ongoing action, the sentences could be judged as true or false depending on how the present simple tense is interpreted. The native controls' mean of 0.68 for PSP suggests that they preferred the habitual reading of the present simple tense in this condition.

Performance on the dual-reading conditions cannot be considered a strong indicator of the presence or absence of nativelikeness. If the native controls performed closer to the target mean than one of the other two groups on one of these conditions, this does not necessarily suggest non-nativelike competence in the other group: it could simply indicate that that group had a stronger or weaker preference for one of the two possible readings than did the group of native controls. Thus, in my analysis I consider single-reading conditions and dual-reading conditions separately.

#### *4.2.2.1.1 Single-Reading Conditions*

For the single-reading conditions of the TVJTs, a lack of a statistically significant difference between either the school bilinguals or the heritage speakers and one of the native control groups was generally interpreted as indicative or at least suggestive of nativelikeness in the group being compared to the native control group. Below, pairs of groups with no statistically significant difference between them are referred to as having “patterned like” each other. If there was a statistically significant difference between a pair of groups, one group is referred to as having “outperformed” or “underperformed” the other. If either the school bilinguals or the heritage speakers underperformed one of the native control groups, the extent to which this was interpreted as indicative or suggestive of non-nativelikeness depended on other

factors, as described below. If either the school bilinguals or the heritage speakers outperformed one of the native control groups, this, like the lack of a statistically significant difference between the two groups under comparison, was generally interpreted as indicative or at least suggestive of nativelikeness in the group being compared to the native control group.

The school bilinguals patterned like the native controls on all six single-reading conditions on the English TVJT and on all five single-reading conditions on the Arabic TVJT. These results suggest that in both languages, the school bilinguals had nativelike proficiency in the two areas of semantics tested. On the English TVJT, the heritage speakers patterned like the native controls and the school bilinguals on the two single-reading conditions of the verbal aspect measure. They were outperformed by the native controls on all four conditions of the article semantics measure (which were all single-reading conditions); on the two TRUE conditions, they patterned like the school bilinguals, and on the two FALSE conditions, they were outperformed by the school bilinguals. On the Arabic TVJT, the heritage speakers patterned like the native controls on the two single-reading conditions of the article semantics measure and were outperformed by the native controls on the three single-reading conditions of the verbal aspect measure. The heritage speakers were outperformed by the school bilinguals on the three single-reading conditions of the verbal aspect measure, and they patterned like the school bilinguals on the two single-reading conditions of the article semantics measure.

#### *4.2.2.1.2 Dual-Reading Conditions*

For the dual-reading conditions of the TVJTs, statistical significance or lack thereof was not treated or interpreted the same way as for single-reading conditions, since, as described above, performance on dual-reading conditions could not be reliably considered as a strong indicator of nativelikeness or lack thereof.

On the two dual-reading conditions of the English TVJT, the school bilinguals' means were closer to the target means than were the other two group means. The two dual-reading conditions were PSN and PSP, with sentences using a verb in the present simple tense, negated in the PSN condition and not negated in the PSP condition, referring to the ongoing activity described in the story. On PSN (a TRUE condition), the group means for the school bilinguals, the heritage speakers, and the native controls were 0.85, 0.77, and 0.73, respectively; and on PSP (a FALSE condition), the group means for the school bilinguals, the heritage speakers, and the native controls were 0.10, 0.26, and 0.20, respectively. With the exception of the difference between the school bilinguals and the native controls on PSN and the difference between the school bilinguals and the heritage speakers on PSP, none of the differences between any of the groups reached statistical significance. Given that these were dual-reading conditions, the statistical significance results are not particularly meaningful, and the only observation that can be safely made is that the school bilinguals leaned more than the other two groups towards the target readings, under which statements using the negated present simple to refer to the ongoing activity that was not a regular activity were considered true, and the non-negated versions of those statements were considered false.

On the Arabic TVJT, there were three dual-reading conditions: two on the article semantics measure and one on the verbal aspect measure. The two article semantics conditions were GNC and SPC, which were both TRUE conditions and both used the definite article: in GNC, each sentence was about a property of the general class of animals, and in SPC, each sentence was about the unusual property of the specific group of animals described in the story. The GNC and SPC group means of the school bilinguals, the heritage speakers, and the native controls, respectively, were 0.77 and 0.33; 0.54 and 0.55; and 0.78 and 0.24. This suggests that

both the school bilinguals and the native controls had a strong preference for the generic reading of the definite article in these conditions, while the heritage speakers had no strong preference for either reading. The school bilinguals' means were not statistically significant from those of the native controls, suggesting the school bilinguals' intuitions and preferences may have been similar in strength to those of the native controls. On the other hand, the differences between the heritage speakers and each of the other two groups were statistically significant, suggesting that the heritage speakers may not have shared the other two groups' intuitions and preferences. In fact, with means close to 0.50 on each condition, the heritage speakers may not have had any clear intuitions or preferences in these conditions, and their performance may have been at chance.

The third dual-reading condition on the Arabic TVJT was PSP (a TRUE condition), with sentences using a non-negated verb in the present simple tense referring to the ongoing activity described in the story. On this condition, the group means for the school bilinguals, the heritage speakers, and the native controls were 0.42, 0.64, and 0.68, respectively. The difference between the school bilinguals and each of the other two groups was statistically significant, while the difference between the heritage speakers and the native controls did not reach statistical significance. Given that these conditions, like the PSN and PSP conditions on the English TVJT, were dual-reading conditions, the statistical significance results are not particularly meaningful, and the only observation that can be safely made is that, unlike on the PSN and PSP conditions on the English TVJT, this time the school bilinguals leaned less than the other two groups towards the target reading, under which statements using the non-negated present simple to refer to the ongoing activity that was not a regular activity were considered true.



#### 4.2.2.2 Grammaticality Judgment Tasks (GJTs)

On the GJTs, participants rated sentences on a scale of 1-6, as follows: 1 = completely unnatural (بمنتهى الركاقة); 2 = almost completely unnatural (ركيقة إلى ما يقارب أقصى حد); 3 = mostly unnatural (ركيقة إلى حد بعيد); 4 = mostly natural (طبيعية إلى حد بعيد); 5 = almost perfectly natural (بمنتهى الطبيعية); 6 = perfectly natural (بمنتهى الطبيعية). Based on this scale, sentences rated between 1 and 3 were considered by the participant to be mostly to perfectly unnatural, while sentences rated between 4 and 6 were considered by the participant to be mostly to perfectly natural. For both languages, the native controls' mean rating for each grammatical condition was above 3.5, and their mean rating for each ungrammatical condition was below 3.5, so all of the native controls' mean ratings fell on the expected side of the midpoint of the scale (3.5). For the GJTs, statistical significance or lack thereof was treated and interpreted the same way as for the single-reading conditions of the TVJTs, as described in Section 4.2.2.1.1.

On the English GJT, the school bilinguals patterned like the native controls on five conditions, outperformed them on six, and underperformed them on one. On the Arabic GJT, they patterned like the native controls on eight conditions, outperformed them on two, and underperformed them on two. If patterning or outperforming the native controls on every condition were to be set as a requirement for nativelikeness, these results would indicate that, as a group, the school bilinguals were not nativelike in either English or Arabic. However, although the school bilinguals did underperform the native controls on one of the 12 conditions of the English GJT and two of the conditions of the Arabic GJT, they outperformed the native controls on six conditions of the English GJT and two conditions of the Arabic GJT. It is reasonable to assume that the fact that the school bilinguals outperformed the native controls on six conditions of the English GJT and two conditions of the Arabic GJT does not mean that the school

bilinguals were in fact *more nativelike* on those conditions than the native controls themselves, but that the discrepancy in these cases is due to other factors. Given that the opposite pattern is observed for only one condition of the English GJT and two conditions of the Arabic GJT, there is no compelling reason to reject the possibility that in these cases, too, the discrepancy is due to other factors and that it does not constitute a strong enough reason to conclude that the school bilinguals were not nativelike. On the contrary, taken as a whole, the results of the GJTs lend strong support to the possibility that the school bilinguals' proficiency was in fact nativelike in each language.

On the English GJT, the condition on which the school bilinguals underperformed the English native controls was P1G on the adverb word order measure, the condition with grammatical sentences in which an adverb occupied the first position (before the subject). Underaccepting grammatical sentences, as in this case, is a much weaker indicator of non-nativeness than is overaccepting ungrammatical sentences. Grammatical sentences may be rejected even by prototypical native speakers due to reasons such as lexical choices and semantic implausibility. However, when ungrammatical sentences are overaccepted, this typically suggests that the grammatical feature in question has not been fully acquired, as the participant seems to lack a sufficient degree of sensitivity to ungrammatical structures.

The P1G condition consisted of English sentences in which the adverbs *sometimes* or *usually* appeared in the first position, before the subject; an example would be *Sometimes John mows the lawn*. The Arabic equivalents of these sentences would be grammatical. The Arabic P1G condition did not include the same adverbs as the English one; instead of *sometimes* and *usually*, the Arabic P1G condition included *always* and *never*, as in the English P1U condition, to maximize the number of target items that were similar in the two languages but differed in

grammaticality. The school bilinguals patterned like the Arabic native controls on the Arabic P1G condition and outperformed the English native controls on the English P1U condition; in other words, they accurately accepted *always* and *never* in the first position in Arabic while accurately rejecting them in the first position in English.

Their underacceptance of *sometimes* and *usually* in the first position in English may have been due to an Arabic influence. If they were aware that *sometimes* and *usually* were grammatical in this position in Arabic, they may have extended the grammaticality distinction between *always* and *never* in the two languages to *sometimes* and *usually*, assuming that since *always* and *never* were grammatical in this position in Arabic but ungrammatical in the same position in English, and since *sometimes* and *usually* were grammatical in this position in Arabic, *sometimes* and *usually* were also ungrammatical in English in the same position. In fact, on the English P1U condition, the school bilinguals not only did not underperform the English native controls but in fact outperformed them, meaning that the school bilinguals more strongly rejected *always* and *never* in the first position than did the English native controls. This strongly supports the idea that, due to an Arabic influence, the school bilinguals may have overgeneralized the *always/never* pattern, with first-position adverbs of frequency that are grammatical in Arabic but not in English, and extended that pattern to *sometimes* and *usually*. Some degree of language interference is found among most if not all people who are highly proficient in two languages, even those who were strictly monolingual until adulthood and did not acquire the second language until they were adults. Such individuals may experience some degree of L2 interference that does not mean that their L1 proficiency is no longer native or nativelike.

On the Arabic GJT, the two conditions on which the school bilinguals underperformed the Arabic native controls were RES on the resumptive pronouns measure, the condition with

resumptive pronouns at the extraction site; and P3G on the adverb word order measure, the condition with grammatical sentences in which an adverb occupied the third position (between the verb and the object). As with the English P1G condition, the Arabic RES and P3G conditions were both grammatical conditions, so again, the school bilinguals underaccepted grammatical items as opposed to overaccepting ungrammatical items.

The school bilinguals' performance in these cases is very likely to be a result of English influence, since on all both counterpart English conditions (RES and P3U), the school bilinguals not only did not underperform the English native controls but in fact outperformed them. This suggests that the school bilinguals' sensitivity to the ungrammaticality of resumptive pronouns in English in the absence of conditions licensing them, and the ungrammaticality of third-position adverbs of frequency in English were so strong that they affected their judgments of the corresponding Arabic sentences. They underaccepted grammatical Arabic sentences with resumptive pronouns, and grammatical Arabic sentences with an adverb of frequency in the third position. As stated above, some amount of language interference need not be a reason to discount the possibility of nativelikeness in the affected language. On the Arabic GJT, as on the English GJT, two out of 12 conditions seem to have been affected by interference from the other language.

On the English GJT, the heritage speakers patterned like the native controls on all 12 conditions, and on the Arabic GJT, the heritage speakers patterned like the native controls on six conditions and underperformed them on six conditions. On the English GJT, the heritage speakers patterned like the school bilinguals on six conditions and underperformed them on six conditions, and on the Arabic GJT, the heritage speakers patterned like the school bilinguals on

five conditions, outperformed them on one condition, and underperformed them on six conditions.

#### *4.2.2.3 Overall Analysis by Group*

Excluding dual-reading conditions, the English tasks consisted of a total of 18 conditions, and the Arabic tasks consisted of a total of 17 conditions. On the English tasks, the school bilinguals patterned like the native controls or outperformed them on 17 out of 18 conditions (94%), and on the Arabic tasks, the school bilinguals patterned like the native controls or outperformed them on 15 out of 17 conditions (88%). As discussed earlier, these cases of underperforming the native controls may have been due to bilingual interference without non-nativelike competence. Interference affecting a language in which a speaker has native or nativelike proficiency is limited, so if, in the case of the school bilinguals, the percentage of conditions appearing to have been potentially affected by this type of interference had been substantial, it might be reasonable to conclude that the results are indicative of non-nativelikeness. However, one out of 18 conditions (6%) and two out of 17 conditions (12%) is well within the range of what one might expect to find among prototypical native speakers whose L2 was not acquired until adulthood. Additionally, although the difference in performance between the school bilinguals and the native controls on these three conditions was statistically significant, on two of the three conditions their group means were descriptively not strikingly far from target: 4.69 on P1G on the English GJT, and 4.52 on RES on the Arabic GJT. Only on one condition, P3G on the Arabic GJT, was their performance strikingly far from target: 3.28 on P3G on the Arabic GJT, which was on the non-target side of the 3.5 midpoint of the scale. (All three conditions were grammatical conditions, so the target mean was 6.) Thus, the results strongly suggest that the school bilinguals were nativelike in both languages.

On the Arabic tasks, the heritage speakers patterned like the native controls on eight out of 17 conditions (47%) and underperformed them on nine out of 17 conditions (53%). This strongly suggests that the heritage speakers were not nativelike in Arabic: 53% is far above what might be expected without non-nativelike competence. Additionally, on the Arabic GJT, the heritage speakers' group means all six conditions on which they underperformed the native controls were strikingly below target: 4.77 on GAP, 4.26 on ENG, 4.07 on NTR, and 3.69 on S4U, all of which were on the non-target side of the 3.5 midpoint of the scale; and 3.32 on P3U and 3.48 on V4U, which were only barely on the right side of the 3.5 midpoint. On the Arabic TVJT, the heritage speakers' group means on the three single-reading conditions on which they underperformed the native controls were not strikingly far from, but also not particularly close to, the target mean: 0.80 on PPP, 0.36 on PPD, and 0.33 on PPN. (PPP was a TRUE condition, with a target mean of 1, and PPD and PPN were FALSE conditions, with target means of 0.)

On the English tasks, the heritage speakers patterned like the native controls on 14 out of 18 conditions (78%) and underperformed them on four out of 18 conditions (22%). While 22% is a somewhat high percentage (although much lower than 53%), all four conditions were on the same measure, article semantics, and there may have been some factor related to this specific measure but not related to nativelikeness that led to these outcomes. Furthermore, despite the statistically significant difference between the heritage speakers' means and those of the native controls, the heritage speakers' means on all four conditions were descriptively very close to target overall: on the two TRUE conditions, they had means of 0.87 and 0.89, and on the two FALSE conditions, they had means of 0.15 and 0.17. It is also possible that a small number of outliers within the group led to these departures from the native-control group mean. Thus, the overall results suggest that the heritage speakers were nativelike in English.

On the English tasks, the heritage speakers patterned like the school bilinguals on ten out of 18 conditions (56%) and underperformed them on eight (44%); and on the Arabic tasks, the heritage speakers patterned like the school bilinguals on seven out of 17 conditions (41%), outperformed them on one (6%), and underperformed them on nine (53%). This suggests that in both languages, the school bilinguals were more proficient than the heritage speakers.

#### 4.2.3 Analysis by Linguistic Area

The five linguistic areas targeted in the TVJTs and GJTs were article semantics, verbal aspect, resumptive pronouns, double objects, and adverb word order. As discussed in Chapter 2, all five of these areas behave differently in the two languages and were thus considered particularly suitable for this study because the likelihood of intrusive transfer was increased. Appendix J reports group means for each condition, and Appendix K shows how the groups compared to each other in terms of statistical significance. Below, I discuss the performance of the school bilinguals and the native controls in some detail, with a view to identifying possible reasons for specific patterns and a particular focus on potential areas of intrusive transfer.

For article semantics, the school bilinguals patterned like the native controls on all of the single-reading conditions in both languages. For English, both groups performed at ceiling on all four conditions, which were all single-reading conditions, with means between 0.95 and 0.99 on the two TRUE conditions and means between 0.02 and 0.05 on the FALSE conditions. For Arabic, both groups performed at ceiling or almost at ceiling (with means between 0.01 and 0.11) on both single-reading conditions, which were both FALSE conditions. This suggests that in both languages, the school bilinguals had fully acquired the relevant semantic patterns and did not exhibit intrusive transfer from the other language.

For verbal aspect, the school bilinguals patterned like the native controls on all of the single-reading conditions. For English, both groups performed at ceiling on both single-reading conditions, with means of 0.99 and 1.00 on PPP (a TRUE condition) and 0.02 and 0.04 on PPN (a FALSE condition). For Arabic, both groups performed at ceiling or almost at ceiling on all three single-reading conditions, with means of 0.97 and 1.00 on PPP (a TRUE condition) and means between 0.04 and 0.11 on PPD and PPN (FALSE conditions). As with article semantics, the results clearly suggest that the school bilinguals had fully acquired the relevant semantic patterns and did not exhibit intrusive transfer from English.

For resumptive pronouns, the school bilinguals patterned like both native control groups on the GAP conditions, with sentences without resumptive pronouns; the sentences were grammatical in English and ungrammatical in Arabic. On the RES conditions, with sentences with resumptive pronouns, the school bilinguals outperformed the English native controls and underperformed the Arabic native controls. These sentences were grammatical in Arabic and ungrammatical in English. For English, both groups performed at ceiling on the GAP condition, with means of 5.64 and 5.77. On the RES condition, the school bilinguals had a mean of 1.98 and the native controls had an accuracy score of 2.76. The English native controls' lower-than-expected mean could possibly be due to the fact that, as discussed in Chapter 2, resumptive pronouns are not always ungrammatical in English, and are licensed under certain conditions. While they were ungrammatical in the sentences included in the study, the English native controls may have had a certain tendency to overaccept them due to their grammaticality in other conditions. It is important to point out that although the school bilinguals outperformed the native controls, the school bilinguals' mean of 1.98 was also not at ceiling, so perhaps they were influenced by the same phenomenon and/or were influenced by Palestinian Arabic, in which



resumptive pronouns are not only grammatical but required. Another factor explaining the below-ceiling performance of the native controls (and possibly that of the school bilinguals) could be inattentive reading. For the sentences with resumptive pronouns, the ungrammaticality was only evident at the last word; without the last word, the sentences would have been grammatical, so if a reader read a sentence too quickly and did not process the last word, they may have mistakenly judged it ungrammatical. In any event, the results suggest that the school bilinguals had acquired the same knowledge and intuitions as prototypical native speakers about sentences with resumptive pronouns and gaps, with a somewhat stronger tendency to reject ungrammatical sentences with resumptive pronouns, although, like the native controls in this study, they did overaccept them to some extent. The school bilinguals' below-ceiling performance on the RES condition may have been (partially) due to intrusive transfer from Arabic.

For Arabic, the school bilinguals patterned like the native controls on the GAP condition, with means of 3.14 (school bilinguals) and 3.39 (native controls). It is striking that the native controls' performance was only barely on the target side of the 3.5 midpoint. One possible explanation for this is that, as discussed earlier, in MSA, in contrast to Palestinian Arabic, gaps are licensed when the extraction site is a direct object, as was the case in the sentences used in this study, so it is possible that the native controls were influenced by MSA, especially if they read the sentences as opposed to listening to them. While this may also be an explanation for the school bilinguals' performance, it is much less likely, since the school bilinguals were not schooled in MSA and were undoubtedly far less proficient in MSA than the native controls. It seems more likely that their performance was due to an English influence, or a combination of an English influence and an MSA influence. It is possible, then, that in this case the school

bilinguals' performance aligned with that of the native controls for different reasons. A follow-up study in which both groups are tested on resumptive pronouns with different extraction sites would help settle this question, as Palestinian Arabic and MSA usage aligns when the extraction site is anything but a direct object. On the RES condition, the school bilinguals' mean was 4.52, and the native controls' mean was at ceiling (5.59). The school bilinguals' performance could have been due to English influence, or inattentive reading, as discussed above, since, again, in each sentence the resumptive pronoun, which transformed the sentence from ungrammatical to grammatical, did not appear until the end of the sentence and could have been missed. This possibility is perhaps even more likely in the case of Arabic than English, since in Arabic the resumptive pronouns were bound-morpheme clitics attached to the verb, so they were not independent words and may thus have been even more vulnerable to being overlooked during processing. All in all, the results suggest that for sentences with gaps, the school bilinguals either had the same intuitions and were subject to the same influences as prototypical native speakers, performed similarly to them for other reasons, or a combination of the two. For sentences with resumptive pronouns, the results suggest that the school bilinguals exhibited intrusive transfer from English, were influenced by inattentive reading, or a combination of the two.

For double objects, the school bilinguals patterned like the native controls on all conditions in both languages except for the NTR and NNS conditions in English, on which they outperformed the native controls. For English, both groups performed at ceiling or almost at ceiling on the BTH condition (which consisted of sentences with double object constructions that were grammatical in both languages) and the NNS condition (which consisted of semantically nonsensical sentences), with means of 5.43 and 5.78 on BTH (grammatical), and 1.10 and 1.36 on NNS (ungrammatical). On the ENG condition (which consisted of sentences with double

object constructions that were grammatical in English but ungrammatical in Arabic), the school bilinguals performed relatively high but not at ceiling (4.69), and the native controls performed almost at ceiling (5.34). On the NTR condition (which consisted of sentences with double object constructions that were ungrammatical in both languages), the school bilinguals performed almost at ceiling, with a mean of 1.71, while the native controls, with a mean of 2.57, performed well below ceiling but well on the target side of the 3.5 midpoint. It is not clear why the native controls' performance was as low as it was on the NTR condition, but in any event, the results suggest that the school bilinguals had acquired the grammatical properties of double object constructions in English and did not exhibit intrusive transfer from Arabic.

For Arabic, both groups performed almost at ceiling on the two grammatical conditions: BTH (which consisted of sentences with double object constructions that were grammatical in both languages) and CAU (which consisted of sentences with grammatically correct causative verbs), with means of 5.38 and 5.22 (school bilinguals) and 5.35 and 5.10 (native controls). The school bilinguals' performance on the NTR condition (ungrammatical) was almost at ceiling, at 1.68. Otherwise, on the two ungrammatical conditions, ENG (which consisted of sentences with double object constructions that were grammatical in English but ungrammatical in Arabic) and NTR (which consisted of sentences with double object constructions that were ungrammatical in both languages), both groups' performance was below ceiling but relatively high, with means of 2.01 (school bilinguals) and 2.48 (native controls) on ENG, and a native-control mean of 2.29 on NTR. It is striking that both groups' lowest performance was on the ENG condition, with means of 2.01 (school bilinguals) and 2.48 (native controls). This suggests that while the school bilinguals overrejected these sentences on the English task, they underrejected them somewhat on the Arabic task, as did the native controls, so it is possible that the school bilinguals were

influenced by English—in other words, that for this condition there was influence in both directions. Since the Arabic native controls were proficient in English (according to their self-ratings), it is possible that they, too, were influenced by English, and this might explain their mean of 2.48, which was farther from target than expected. This contrasts with the ENG mean of the English native controls, most of whom were not proficient in Arabic (according to their self-ratings), at 5.34. It is not clear why on the NTR condition, the native controls' performance was lower than expected (2.29), while the school bilinguals' performance was almost at ceiling (1.68), but the difference between the two groups did not reach statistical significance. All in all, the results, although a bit “messy,” suggest that the school bilinguals had acquired the grammatical properties of double object constructions in Arabic, with a minor English influence at most.

For adverb word order, the school bilinguals underperformed the native controls on one condition in each language. For English, they patterned like the native controls on two conditions and outperformed them on three; and for Arabic, they patterned like the native controls on three conditions and outperformed them on two. For English, both groups performed at ceiling (with means between 5.91 and 5.97) on P2G and P4G, with grammatical sentences that had an adverb in the second or fourth position. On all three ungrammatical conditions (P1U, P2U, and P3U), which had an adverb in the first, second, and third position, respectively, the school bilinguals outperformed the native controls. The native controls' performance was only barely on the target side of the 3.5 midpoint (with means between 3.04 and 3.44) and the school bilinguals' performance was relatively high but not at ceiling on P2U and P3U (with means of 2.15 and 2.01, respectively) and almost at ceiling on P1U (at 1.80). For five of the six adverbs used in the ungrammatical sentences (all but *never*), the sentences could conceivably be improved with

commas, as in *Always, John mows the lawn* (P1U); *John, every day, mows the lawn* (P2U); *Kevin, every week, reads the newspaper* (P2U); *John mows, sometimes, the lawn* (P3U); and *Kevin reads, usually, the newspaper* (P3U). Perhaps the native controls overaccepted these sentences because they processed some of them as though they had commas. The school bilinguals' below-ceiling performance could be due to the same phenomenon, to an Arabic influence, or to a combination of the two. An Arabic influence is less plausible for P3U, since the school bilinguals' mean on the corresponding Arabic condition (P3G) was only 3.28, which was on the non-target side of the 3.5 midpoint.

On P1G, with grammatical sentences that had an adverb in the first position, the native controls' mean was at ceiling (5.64), and the school bilinguals' mean was relatively high but not at ceiling (4.69). This was the only English condition on which the school bilinguals were outperformed by the native controls. As discussed in Section 4.2, this may have been due to an overgeneralization of the pattern of *always* and *never*, which in the first position are ungrammatical in English and grammatical in Arabic, and an extension of that pattern to *sometimes* and *usually*, the adverbs tested in the English P1G condition. Nevertheless, although the school bilinguals' mean was not at ceiling, it was still relatively high, at 4.69. Overall, the results suggest that the school bilinguals had acquired the rules for the word order of English adverbs of frequency, with at most a slight degree of intrusive transfer from Arabic in the case of *sometimes* and *usually* in the first position.

For Arabic, the school bilinguals patterned like the native controls on three conditions, outperformed them on two, and underperformed them on one. On the three ungrammatical conditions (P3U, S4U, and V4U), the school bilinguals' performance was almost at ceiling (with means of 1.69, 1.67, and 1.52, respectively), while the native controls' performance was

relatively high but not at ceiling (with means of 2.29, 2.49, and 2.23, respectively). The native controls' lower-than-expected performance on the ungrammatical conditions may have been due to inattentive reading and/or top-down processing while reading. The sentences in the ungrammatical conditions, which all contained one of two adverbs meaning *never*, could be made grammatical by the addition of a single-character bound-morpheme negation suffix to the verb. For example, *\*Sara btōkol wala marra keks* 'Sarah never eats cake' is ungrammatical, while *Sara btukulesh wala marra keks* (with the negation suffix *-sh* added to the verb *btōkol*) is grammatical. Since the negation suffix would consist of a single character attached as a bound morpheme, it is possible that some of these sentences were processed top-down by the native controls as though they had contained that suffix.

On P1G (grammatical), both groups' performance was relatively high but not at ceiling, with means of 4.66 (school bilinguals) and 4.61 (native controls); and on P2G (grammatical), both groups' performance was almost at ceiling, with means of 5.15 (school bilinguals) and 5.47 (native controls). On P3G (grammatical), the school bilinguals' mean was 3.28, which was on the non-target side of the 3.5 midpoint, while the native controls' mean was relatively high but not at ceiling, at 4.52. As discussed earlier, the school bilinguals' underacceptance of adverbs in the third position may have been due to an English influence. It is striking that on both P1G and P3G, the native controls' means (4.61 and 4.52, respectively) were lower than expected. It may be the case that these word orders, although grammatical, are dispreferred by prototypical native speakers, or that the Arabic native controls were influenced by English, or a combination of the two. All in all, the results suggest that the school bilinguals had acquired the rules for the word order of Arabic adverbs of frequency, with at most a slight degree of intrusive transfer from English in the case of *marrāt* "sometimes" and *ādatan* "usually" in the third position.

The above analysis of patterns observed by linguistic area, and potential explanations for those patterns, lends strong support to the idea that the school bilinguals were nativelike in both languages, with at most a small amount of intrusive transfer as an inevitable result of bilingualism. Furthermore, the reflections on means in terms of their distance from at-ceiling performance further support the idea that simply comparing the performance of a targeted population to that of native controls can be misleading. In some cases, the performance of the native controls was lower than expected. In such cases, the performance being compared to that of the native controls should not be taken to necessarily warrant the same conclusions as it would if the native controls had performed at ceiling or almost at ceiling.

#### 4.2.4 Conclusion

The results analyzed in this section are relevant to RQ1 and RQ4, reproduced below along with the hypotheses responding to them:

- RQ1: If the home and societal language is the L1, can full-immersion schooling in the L2 lead to L2 nativelikeness?
- H1: Yes. If the home and societal language is the L1, full-immersion schooling in the L2 can lead to L2 nativelikeness.
- RQ4: Can full-immersion schooling in the L2 lead to nontargetlike L1 competence?
- H4: Yes. Full-immersion schooling in the L2 can lead to nontargetlike L1 competence.

Overall, the results lend strong support to H1, and at best a small amount of support to H4.

#### 4.3 NATIVELIKENESS BY PARTICIPANT

Appendix L reports participant means by condition for each of the TVJTs and GJTs. With a view to measuring individual participants' nativelikeness in each language, a

nativelikeness score was calculated for each of the school bilinguals and the heritage speakers. For each condition other than the dual-reading conditions on the TVJTs, a participant received, for TRUE and grammatical conditions, a nativelikeness score of 1 if their mean was greater than or equal to that of the minimum native-control participant mean in the respective language, and a score of 0 if not; and, for FALSE and ungrammatical conditions, a nativelikeness score of 1 if their mean was less than or equal to that of the maximum native-control participant mean in the respective language, and a score of 0 if not. This was based on the scoring method used by Abrahamsson and Hyltenstam (2009), who gave each participant a “scrutinized nativelikeness”<sup>21</sup> score between 1 and 10 based on the number of instruments, of a total of 10, on which the participant’s performance was the same or higher than the native-control minimum.

Since there were a total of 18 English conditions and a total of 17 Arabic conditions, the highest possible total nativelikeness scores were 18 for English and 17 for Arabic. Thus, for each language, the school bilinguals and the heritage speakers were assigned nativelikeness scores out of 18 for English and out of 17 for Arabic, indicating how many conditions they were nativelike in. Table 11 reports the school bilinguals’ and heritage speakers’ nativelikeness scores.

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<sup>21</sup> In contrast to “perceived nativelikeness,” which was based on native speakers’ perception of L2 speakers’ oral production, “scrutinized nativelikeness” was based on the results of the 10 instruments administered in the study and whose results are analyzed in the article.



**Table 11:** School Bilinguals' and Heritage Speakers' Nativelikeness Scores

<b>Group</b>	<b>Participant</b>	<b>English</b>	<b>Arabic</b>
<b>School Bilinguals</b>	<b>SB09</b>	18	17
	<b>SB12</b>	14	13
	<b>SB13</b>	18	17
	<b>SB14</b>	18	17
	<b>SB15</b>	18	17
	<b>SB16</b>	17	16
	<b>SB21</b>	17	17
	<b>SB22</b>	17	17
	<b>SB24</b>	18	17
	<b>SB26</b>	18	16
	<b>SB34</b>	18	16
	<b>SB35</b>	17	17
	<b>SB36</b>	18	17
	<b>SB37</b>	18	16
	<b>SB41</b>	18	15
	<b>SB42</b>	17	16
<b>Heritage Speakers</b>	<b>HS13</b>	17	14
	<b>HS14</b>	17	16
	<b>HS16</b>	17	17
	<b>HS17</b>	12	12
	<b>HS18</b>	18	16
	<b>HS19</b>	15	12
	<b>HS21</b>	17	16
	<b>HS22</b>	18	13
	<b>HS23</b>	11	17
	<b>HS24</b>	16	15
	<b>HS25</b>	18	13
	<b>HS26</b>	17	13
	<b>HS28</b>	16	14
	<b>HS31</b>	18	17
	<b>HS32</b>	16	12
	<b>HS34</b>	18	13
	<b>HS37</b>	16	15
	<b>HS39</b>	18	16
	<b>HS42</b>	16	15
	<b>HS44</b>	17	14
	<b>HS46</b>	18	15
	<b>HS48</b>	16	15

For English, 10 school bilinguals (62%) had a nativelikeness score of 18, five (31%) had a score of 17, and one (6%) had a score of 14. For Arabic, nine (56%) had a score of 17, five (31%) had a score of 16, one (6%) had a score of 15, and one (6%) had a score of 13. Six school bilinguals (38%) had the maximum score for each language, and seven (44%) had the maximum score for one language and a score within two points of the maximum score in the other language. For those seven school bilinguals, the language with a maximum score was English in four cases and Arabic in three cases. For all but one of these seven school bilinguals, the non-maximum score was one point below the maximum; one had a non-maximum score two points below the maximum. For two school bilinguals (13%), each score was one point below the maximum, and finally, one school bilingual (6%) had a score of 14 for English and a score of 13 for Arabic (each four points below the maximum).

While maximum scores are strong indicators of nativelikeness, scores just below the maximum are not necessarily indicative of *non*-nativelikeness, since, as mentioned above, some slight departures from maximum scores may be due to factors like language interference unrelated to incomplete acquisition or a faulty learning mechanism. In the case of the school bilinguals, with the exception of one participant who scored 14 for English and 13 for Arabic, not a single participant scored less than two points below the maximum. Even 14 and 13, at four points below the maximum, are not drastically below the maximum. Thus, although not all of the school bilinguals' nativelikeness scores by participant are maximum scores, the scores do, as a whole, lend strong support to the possibility that at the individual level, all of the school bilinguals were nativelike in both languages or, at the very least, very close to it; in any case, there was very little individual variation within this group with regard to nativelikeness in either language. Additionally, 13 school bilinguals (81%) had the maximum score in at least one

language. Thus, the results suggest that with the exception of three participants (19%), each school bilingual was clearly nativelike in at least one language, and potentially nativelike in the other language as well.

Compared to the school bilinguals, the heritage speakers' nativelikeness by participant scores were less consistent and less clustered together. For English, seven heritage speakers (32%) had a nativelikeness by condition score of 18, six (27%) had a score of 17, six (27%) had a score of 16, one (5%) had a score of 15, one (5%) had a score of 12, and one (5%) had a score of 11. For Arabic, three (14%) had a nativelikeness by condition score of 17, four (18%) had a score of 16, five (23%) had a score of 15, three (14%) had a score of 14, four (18%) had a score of 13, and three (14%) had a score of 12. Only one heritage speaker (5%) had the maximum score for each language. Four heritage speakers (18%) had the maximum score for one language and a score within two points of the maximum score in the other language. For those four school bilinguals, the language with a maximum score was English in three cases and Arabic in one case. For all but one of these seven school bilinguals, the non-maximum score was one point below the maximum; one had a non-maximum score two points below the maximum. Three heritage speakers (14%) had the maximum score in English and a score of 13 (four points below the maximum) in Arabic, and one heritage speaker (5%) had the maximum score in Arabic and a score of 11 (seven points below the maximum) in English. For two heritage speakers (9%), each score was one point below the maximum, and for four heritage speakers (18%), each score was two points below the maximum. For three heritage speakers (14%), the English score was one point below the maximum and the Arabic score was three or four points below the maximum, and for three heritage speakers (15%), the English score was two points below the maximum and the Arabic score was three or five points below the maximum. Finally, two heritage speakers

(9%) had a score of 12 for Arabic (five points below the maximum) and a score of 12 or 15 (three or six points below the maximum) for English.

The heritage speakers' nativelikeness scores for English suggest that most of the heritage speakers were nativelike or at least very close to nativelike, since 19 (86%) had a score of 16, 17, or 18; one (5%) had a score of 15, and only two (9%) had scores of 11 or 12. Thus, while the participants with scores of 11 and 12 were clearly not nativelike in English, the vast majority of the others were nativelike or at least very close to it, and one was at least reasonably close to it. This is a typical pattern among heritage speakers, who tend to be dominant in the L2 or majority language. Overall, there was not a great deal of individual variation within this group with regard to nativelikeness in English.

For Arabic, 12 heritage speakers (55%) had a nativelikeness score of 15, 16, or 17; three (14%) had a score of 14; four (18%) had a score of 13; three (14%) had a score of 12. This suggests that three heritage speakers were clearly not nativelike in Arabic, about two thirds of the remaining 19 were nativelike or at least very close to it, and the other third was at least reasonably close to it. Here, too, individual variation was relatively moderate, although greater than was observed for English. The results suggest that nine heritage speakers (41%)—those with the maximum score for at least one of the two languages—were clearly nativelike in at least one language.

Six out of 16 school bilinguals (38%) had the maximum score for each language, while this was the case for only one heritage speaker (5%). This suggests that in terms of nativelikeness at the individual level, even if the strictest possible minimum requirement—the maximum score—were adopted as a criterion for nativelikeness, the findings would indicate that five school bilinguals (31%) and one heritage speaker (5%) were nativelike in both languages.

The nativelikeness by participant results are relevant to RQ1, RQ2, and RQ4, reproduced below along with the hypotheses responding to them:

- RQ1: If the home and societal language is the L1, can full-immersion schooling in the L2 lead to L2 nativelikeness?
- RQ2: If the home and societal language is the L1, is full-immersion schooling in the L2 *sufficient* for L2 nativelikeness?
- RQ4: Can full-immersion schooling in the L2 lead to nontargetlike L1 competence?
- H1: Yes. If the home and societal language is the L1, full-immersion schooling in the L2 can lead to L2 nativelikeness.
- H2: No. If the home and societal language is the L1, full-immersion schooling in the L2 is not sufficient for L2 nativelikeness, and some school bilinguals will not pattern like monolingual L2 controls.
- H4: Yes. Full-immersion schooling in the L2 can lead to nontargetlike L1 competence.

The results support H1, since at least some of the school bilinguals were clearly nativelike. It is less clear whether H2 or H4 are supported. While 38% of the school bilinguals had an English nativelikeness score below 18 (31% had a score of 17 and 6% had a score of 14), these departures from maximum scores are not necessarily indicative of non-nativelikeness, since they may not be due to faulty or incomplete L2 learning mechanisms. For these reasons, the data may not support H2. Similarly, while 44% of the school bilinguals had an Arabic nativelikeness score below 17 (31% had a score of 16, 6% had a score of 15, and 6% had a score of 13), these departures from maximum scores are not necessarily indicative of nontargetlike L1 competence, since they may not be due to L1 attrition. It is entirely plausible that the observed departures

from maximum scores may be due to a limited amount of inevitable interference between the L1 and the L2 that does not mean that the school bilinguals were not nativelike in both languages. For these reasons, the data may not support H4.

Compared to the school bilinguals, the heritage speakers had a larger percentage of departures from maximum scores (68% for English, and 86% for Arabic), and for English and Arabic, 9% and 14%, respectively, had a score below the lowest score observed for the school bilinguals. These departures are far enough from maximum scores to suggest that not every single heritage speaker was nativelike in both languages.

#### 4.4 INDIVIDUAL VARIATION

The language use and exposure scores, the socioaffective scores, and the language aptitude scores were used to ascertain whether nativelikeness scores correlated with language use and exposure, socioaffective factors, and/or language aptitude. Linear models were run using the `lm` function from the `lme4` package in R in order to test for correlations between the school bilinguals' and the heritage speakers' nativelikeness scores and their language use and exposure scores, socioaffective factor scores, and language aptitude scores. For each nativelikeness score (English and Arabic), nine models were run for each group: one using the three language aptitude scores, four using the socioaffective factor scores (one for each combination of English/United States, Arabic/Arab World, during schooling, and since graduation), three using the language use and exposure scores (one each for activity, stage, and setting), and one using the global scores (the three global language use and exposure scores, the two global socioaffective factor scores, and the global language aptitude score). The following is an example of the formulas used:

$$NL\_EN\_C \sim LLAMA\_B + LLAMA\_E + LLAMA\_F$$

In this example, NL\_EN\_C refers to the English nativelikeness score (the C indicates that the score is the sum of the scores for each condition), and the other factors refer to the three language aptitude scores (for the three different sections of the language aptitude test, respectively). Of the 128 possible correlations tested for (64 for each group), only nine (7%) were statistically significant based on an alpha level of 0.05. These are reported in Table 12. For each correlation, the relevant output is given as generated by the model.

**Table 12:** Correlations between Nativelikeness Scores and Other Factors

Group	Nativelikeness Score	Correlate	Estimate	Std. Error	t value	Pr(> t )
SB	English	LUE_R	7.811	2.144	3.643	0.00387
		LUE_W	-8.531	2.856	-2.987	0.01237
		SA_E/SG/A	0.5422	0.2457	2.207	0.0476
		SA_E/SG/P	-0.7329	0.2561	-2.862	0.0143
		SA-E/SG/S	0.3893	0.1617	2.408	0.0330
SB	Arabic	LUE_R	6.297	2.450	2.570	0.026
HS	English	SA_E/SG/S	1.0248	0.4625	2.216	0.0398
		LLAMA_F	0.23770	0.10409	2.283	0.0348
HS	Arabic	LLAMA_B	0.1474737	0.0531888	2.773	0.0126

SB = school bilinguals; HS = heritage speakers; Pr(>|t|) = p-value  
Language use and exposure scores: LUE\_R = reading; LUE\_W = writing  
Socioaffective factor scores:  
 SA\_E/SG/A = English/US, during school, attitudinal; SA\_E/SG/P = English/US, since graduation, personal; SA\_E/SG/S = English/US, since graduation, social



The school bilinguals' English nativelikeness scores correlated with five factors: their scores for reading, writing, attitudinal factors since graduation for English and the US, personal factors since graduation for English and the US, and social factors since graduation for English and the US. Three factors correlated in the expected direction, and the other two correlated in the opposite direction. The nativelikeness scores increased with increased amounts of reading in English and with increased attitudinal and social identification with English and the US since graduation. On the other hand, they also increased with increased amounts of writing in *Arabic* and with *decreased* personal identification with English and the US since graduation. The school bilinguals' Arabic nativelikeness scores correlated with their score for reading, not in the expected direction: their nativelikeness scores increased with increased amounts of reading in *English*. These results suggest that despite the differences in the school bilinguals' length of residence in English-speaking countries following graduation, the extent of their use of and exposure to English had little to no impact on their nativelikeness outcomes.

The heritage speakers' English nativelikeness scores correlated with two factors: their scores for social factors since graduation for English and the US, and the LLAMA\_F section of the language aptitude test. Both factors correlated in the expected direction: their nativelikeness scores increased with increased social identification with English and the US since graduation, and with increased LLAMA\_F scores. The heritage speakers' Arabic nativelikeness scores correlated with their scores for the LLAMA\_B section of the language aptitude test, in the expected direction: their nativelikeness scores increased with increased LLAMA\_B scores.

For the school bilinguals, language aptitude did not appear to explain any of the individual variation in nativelikeness scores. While language use and exposure and socioaffective factors did appear to explain the individual variation to some extent, there were

very few correlations overall (three out of a possible 28, i.e., 11%, for each of language use and exposure, and socioaffective factors); and only one of the 28 possible language use and exposure factors (4%), and two of the 28 possible socioaffective factors (7%) correlated in the expected direction. These results are relevant to RQ3, reproduced below along with the hypothesis responding to it:

- RQ3: Do language use and exposure, language aptitude, and social, personal, and attitudinal factors contribute to individual variation?
- H3: Yes. Language use and exposure, language aptitude, and social, personal, and attitudinal factors contribute to individual variation.

Given that the significant correlations were very few and constituted a mix of expected and unexpected correlations, H3 is largely disconfirmed.

For the heritage speakers, language use and exposure did not appear to explain any of the individual variation in nativelikeness scores. While there was one socioaffective factor that correlated in the expected direction and thus did appear to explain the individual variation to some extent, this was only one correlation out of a possible 28 (4%). Language aptitude, on the other hand, appeared to explain some of the individual variation in nativelikeness scores to a larger extent, with two out of a possible eight correlations (25%) and both factors correlating in the expected direction. Thus, with the exception of language aptitude in the case of the heritage speakers, the overall results for language use and exposure, socioaffective factors, and language aptitude do not provide any robust indications of factors explaining individual variation in nativelikeness scores for either the school bilinguals or the heritage speakers.

#### 4.5 DOMINANCE BY GROUP

The results of the EITs in each language were analyzed to test the school bilinguals' and heritage speakers' dominance, i.e., to test which of the two languages they were dominant in.

To test the comparability of the English and Arabic tasks, since they were being used to measure dominance, a linear mixed effects model was run with the English and Arabic native control group data, using the `lmer` function from the `lme4` package, as well as the `afex` package; with accuracy score as the dependent variable, group as a fixed effect, and subject and item as random effects. The following formula was used:<sup>22</sup>

$$\text{score} \sim \text{group} + (1 \mid \text{subject}) + (1 \mid \text{item})$$

The mixed model output is given in Table 13.<sup>23</sup>

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<sup>22</sup> The model output indicated a singular fit and no random effect of item, suggesting that the model was overfitted due to the inclusion of item as a random effect. To check whether the inclusion of item had affected the p-value, the model was re-run without item as a random effect. The p-value remained unchanged.

<sup>23</sup> As indicated in the model output, the name of the dataset used was *EIT\_ALL*.

**Table 13:** Linear Mixed Model Output for Native Controls' Mean Scores on EITs

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Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest']					
Formula: score ~ group + (1   subject) + (1   item)					
Data: EIT_ALL					
REML criterion at convergence: -3420.2					
Scaled residuals:					
Min	1Q	Median	3Q	Max	
-11.6796	0.0327	0.0327	0.0985	0.4742	
Random effects:					
Groups	Name	Variance	Std.Dev.		
item	(Intercept)	0.0000000	0.00000		
subject	(Intercept)	0.0001106	0.01052		
Residual		0.0071364	0.08448		
Number of obs: 1643, groups: item, 60; subject, 55					
Fixed effects:					
	Estimate	Std. Error	df	t value	Pr(> t )
(Intercept)	0.987814	0.003991	53.434229	247.528	<2e-16 ***
groupEN	0.008140	0.005148	53.277094	1.581	0.12
---					
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Correlation of Fixed Effects:					
	(Intr)				
groupEN	-0.775				
optimizer (nloptwrap) convergence code: 0 (OK)					
boundary (singular) fit: see ?isSingular					

---

To test the school bilinguals' and the heritage speakers' dominance, a linear mixed effects model was run for each group using the lmer function from the lme4 package, as well as the afex package; with score as the dependent variable, measure (English task or Arabic task) as a fixed effect, and subject and item as random effects. The following formula was used:<sup>24</sup>

$$\text{score} \sim \text{measure} + (1 \mid \text{subject}) + (1 \mid \text{item})$$

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<sup>24</sup> For the school bilingual group, the model output indicated a singular fit and almost no random effect of item (variance = 1.932e-11), suggesting that the model was overfitted due to the inclusion of item as a random effect. To check whether the inclusion of item had affected the p-value, the model was re-run without item as a random effect. The p-value remained unchanged.

The mixed model outputs are given in Tables 14 and 15. As indicated in the model outputs, the name of the datasets used were *EIT\_SB* and *EIT\_HS*, respectively.

**Table 14:** Linear Mixed Model Output for School Bilinguals' Mean EIT Scores

---

Linear mixed model fit by REML. t-tests use Satterthwaite's method					
['lmerModLmerTest']					
Formula: score ~ measure + (1   subject) + (1   item)					
Data: EIT_SB					
REML criterion at convergence: -1478.5					
Scaled residuals:					
Min	1Q	Median	3Q	Max	
-8.9528	0.0278	0.1029	0.1564	0.3577	
Random effects:					
Groups	Name	Variance	Std.Dev.		
item	(Intercept)	1.932e-11	4.395e-06		
subject	(Intercept)	1.491e-04	1.221e-02		
Residual		1.222e-02	1.106e-01		
Number of obs: 959, groups: item, 60; subject, 16					
Fixed effects:					
	Estimate	Std. Error	df	t value	Pr(> t )
(Intercept)	0.991631	0.005903	37.176654	167.995	<2e-16 ***
measureEN-EIT	-0.008297	0.007141	941.986604	-1.162	0.246
---					
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Correlation of Fixed Effects:					
	(Intr)				
measrEN-EIT	-0.606				
optimizer (nloptwrap) convergence code: 0 (OK)					
boundary (singular) fit: see ?isSingular					

---

**Table 15:** Linear Mixed Model Output for Heritage Speakers' Mean EIT Scores

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Linear mixed model fit by REML. t-tests use Satterthwaite's method
['lmerModLmerTest']
Formula: score ~ measure + (1 | subject) + (1 | item)
Data: EIT_SB

REML criterion at convergence: -1478.5

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.9528  0.0278  0.1029  0.1564  0.3577

Random effects:
Groups   Name              Variance Std.Dev.
item     (Intercept) 1.932e-11 4.395e-06
subject  (Intercept) 1.491e-04 1.221e-02
Residual                    1.222e-02 1.106e-01
Number of obs: 959, groups:  item, 60; subject, 16

Fixed effects:
              Estimate Std. Error      df t value Pr(>|t|)
(Intercept)    0.991631   0.005903  37.176654 167.995 <2e-16 ***
measureEN-EIT -0.008297   0.007141 941.986604  -1.162   0.246
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
measrEN-EIT -0.606
optimizer (nloptwrap) convergence code: 0 (OK)
boundary (singular) fit: see ?isSingular

```

---

For the linear mixed model that was run to test the comparability of the English and Arabic (see Table 14), pairwise comparisons were run using the `enmeans` function from the `enmeans` package, to test for a significant effect of group. The following formula was used:

$$\text{pairwise} \sim \text{group}$$

For the linear mixed models that were run to test the school bilinguals' and the heritage speakers' dominance, pairwise comparisons were run using the `enmeans` function from the `enmeans` package, to test for a significant effect of group. The following formula was used:

$$\text{pairwise} \sim \text{measure}$$

Table 16 reports the results of the three pairwise comparisons. For each comparison, the contrast output is given as generated by the model. The final column in each table indicates whether each difference was statistically significant based on an alpha level of 0.05. The degrees of freedom were approximated using the Kenward-Roger approximation method.

**Table 16:** EITs: Pairwise Comparisons

Comparison	contrast	estimate	SE	df	t.ratio	p.value	S
EN / AR	AR - EN	-0.00814	0.00515	38.1	-1.581	0.1221	
SB: Eng / Ar	(AR-EIT) - (EN-EIT)	0.00832	0.00718	957	1.158	0.2472	
HS: Eng / Ar	(AR-EIT) - (EN-EIT)	-0.405	0.02	1307	-20.195	<.0001	*

SE = standard error; df = degrees of freedom; t.ratio = t-ratio; p.value = p-value  
S = significance; \* = statistically significant (p-value < 0.05)  
EN = English native controls; AR = Arabic native controls; SB = school bilinguals; HS = heritage speakers  
Eng = English EIT; Ar = Arabic EIT; EN-EIT = English EIT; AR=EIT = Arabic EIT

As shown in Table 14, the difference between the performance of the two groups of native controls on their respective EITs was not statistically significant based on an alpha level of 0.05, suggesting that the two tasks were comparable. For the school bilinguals, there was no significant difference in performance between the English EIT and the Arabic EIT, while the heritage speakers' performance on the English EIT was significantly higher than their performance on the Arabic EIT. These results suggest that the heritage speakers were dominant in English, and for the school bilinguals, the results do not point to dominance in either language and suggest that they were possibly balanced bilinguals. Thus, H5, reproduced below along with the research question it responds to, is disconfirmed.

- RQ5: Can full-immersion schooling in the L2 lead to balanced bilingualism? If not, in which of the two languages will the bilinguals be *dominant* with regard to proficiency?
- H5: With regard to proficiency, the school bilinguals will be dominant in English.

## 4.6 SUMMARY

This chapter presented the results of the study that were analyzed for this dissertation. It included scoring methods, descriptive statistics, descriptions of models and comparisons run in R, and the important results of those models, with a specific focus on statistical significance. The results of the TVJTs and GJTs and the results for nativelikeness by participant support H1 (that full-immersion schooling can lead to L2 nativelikeness), while lending little to no support to H2 (that full-immersion schooling is not sufficient for L2 nativelikeness) and H4 (that full-immersion schooling can lead to nontargetlike L1 competence). The results for individual variation lend little to no support to H3 (that language use and exposure, language aptitude, and social, personal, and attitudinal factors contribute to individual variation in nativelikeness), and the results for dominance disconfirm H5 (that full-immersion schooling leads to L2 dominance).

All in all, only one of the five hypotheses (H1) was clearly confirmed; the other four were either disconfirmed or very weakly supported at best. Overall, the results paint a markedly different picture from those of the pilot study. Unlike the results of the pilot study, these results suggest 1) that L2 nativelikeness is not only *possible* with full-immersion schooling but that it may in fact occur consistently, with little to no individual variation; 2) that at least in most cases, full-immersion schooling does not compromise L1 nativelikeness; and 3) that at least in most cases, full-immersion schooling does not lead to L2 dominance but balanced bilingualism. Thus, while H1 was confirmed by both this study and the pilot study and H3 was not addressed in the pilot study, the results suggest that the remaining hypotheses, which were based on the findings of the pilot study, were too conservative. Chapter 5 will unpack the results in more detail and discuss their broader implications.



## CHAPTER 5: DISCUSSION AND CONCLUSION

### 5.1 INTRODUCTION

The results discussed in the previous chapter point to some interesting trends and provide some thought-provoking initial impressions on nativelikeness in the context of bilingualism. This chapter goes a step further than the observations made in the previous chapter and takes a closer, more critical, and more analytical look at the results in light of the questions raised at the outset of this dissertation and the themes those questions speak to. Section 5.2 provides a recap of the present study and its findings. Sections 5.3-5.5 focus on measuring nativelikeness, individual variation, and dominance, respectively. Section 5.6 further nuances the picture by considering other factors—namely, language status and prestige, perceptions of Arabic, and the role of active language use—that are important for a thorough assessment of the results and their implications. Section 5.7 focuses on the main theme of this dissertation: the relationship between full-immersion schooling and nativelikeness. Section 5.8 offers directions for further research, and Section 5.9 concludes the dissertation.

### 5.2 RECAP OF THE PRESENT STUDY

The purpose of the present study was to contribute to our understanding of ultimate attainment in second language acquisition by investigating the relationship between full-immersion schooling, nativelikeness, and bilingual dominance. As defined for the purposes of this dissertation, full-immersion schooling uses a medium of instruction that is not the students' L1 and occurs in a non-immigrant setting at a school sharing many SLA-relevant characteristics—in addition to the medium of instruction—with a school in a typical setting in which the medium of instruction is also the students' L1 and the predominant home and societal language. The study's target population, labeled *school bilinguals*, consisted of L1-Arabic L2-

English individuals who received the majority of their schooling at a full-immersion English-medium school. The school bilinguals were tested in both languages and compared with native speaker controls of each language as well as heritage speakers of Arabic who grew up in a setting in which English was the predominant school and societal language.

The main impetus behind the study was a desire to gain a deeper understanding of an understudied linguistic environment that seems to maximally favor successful L2 acquisition while potentially hampering L1 acquisition, and to ascertain whether such an environment can lead to L2 nativelikeness, and if so, whether that L2 nativelikeness is concomitant with L1 attrition or incomplete acquisition. The answer to these questions was expected to be of interest to parents, among others, since many may not prefer a type of schooling that leads to L2 proficiency at the expense of fully developed L1 proficiency. Additionally, the study sought to identify how this environment might impact bilingual dominance, as well as whether bilinguals of this type exhibit individual variation, and if so, whether language aptitude, language use and exposure, or socioaffective factors correlate with it. Finally, the study sought to determine how the outcomes of this environment compare to those experienced by heritage speakers of the L1, who differ from the target population in one crucial aspect. Heritage speakers of the L1 share the same L2 as the target population as well as the same L1-L2 distribution in two of the three major linguistic settings that influence ultimate attainment—home and school—and differ from the target population in having had the L2, rather than the L1, as the predominant societal language.

The study used a number of instruments that were specifically designed to answer the above questions. The instruments whose results were analyzed for this dissertation were a Truth Value Judgment Task (TVJT) and a Grammaticality Judgment Task (GJT) in each language, designed to test for nativelikeness in a number of areas of semantics and morphosyntax; a

language aptitude test and a linguistic questionnaire targeting language use and exposure as well as socioaffective factors (social, personal, and attitudinal) to test for factors that may account for individual variation; and an Elicited Imitation Task (EIT) in each language to measure dominance.

The study was guided by five research questions and hypotheses:

- RQ1: If the home and societal language is the L1, can full-immersion schooling in the L2 lead to L2 nativelikeness?
- RQ2: If the home and societal language is the L1, is full-immersion schooling in the L2 *sufficient* for L2 nativelikeness?
- RQ3: Do language use and exposure, language aptitude, and social, personal, and attitudinal factors contribute to individual variation?
- RQ4: Can full-immersion schooling in the L2 lead to nontargetlike L1 competence?
- RQ5: Can full-immersion schooling in the L2 lead to balanced bilingualism? If not, in which of the two languages will the bilinguals be *dominant* with regard to proficiency?
  
- H1: Yes. If the home and societal language is the L1, full-immersion schooling in the L2 can lead to L2 nativelikeness.
- H2: No. If the home and societal language is the L1, full-immersion schooling in the L2 is not sufficient for L2 nativelikeness, and some school bilinguals will not pattern like monolingual L2 controls.
- H3: Yes. Language use and exposure, language aptitude, and social, personal, and attitudinal factors contribute to individual variation.
- H4: Yes. Full-immersion schooling in the L2 can lead to nontargetlike L1 competence.

- H5: With regard to proficiency, the school bilinguals will be dominant in English.

For school bilinguals, the results consistently point to nativelikeness in both languages and balanced bilingualism. For heritage speakers, the dominance results clearly point to dominance in English, while the nativelikeness results provide a less consistent picture of nativelikeness, although, taken as a whole, both sets of results broadly point to nativelikeness in English and non-nativelikeness in Arabic. Both groups exhibited fairly consistent patterns across participants with very little individual variation and very few correlations between individual variation and language aptitude, language use and exposure, or socioaffective factors.

The results seem to make a strong case for full-immersion schooling as a path to nativelikeness in two languages and balanced bilingualism, as compared to a heritage speaker environment, which this study, like many others before it, suggests is conducive to L2 nativelikeness but not to L1 nativelikeness. The results suggest, then, that for bilinguals whose home language is the L1 and whose school language is the L2, the societal language does not impede L2 nativelikeness, which obtains regardless of which language the societal language is, while for L1 nativelikeness the societal language makes a crucial difference, favoring L1 nativelikeness in the case of the school bilinguals while impeding it in the case of heritage speakers.

I will now consider the results in further detail, with a view to nuancing the general impressions they give off and reflecting on their implications for the broader themes of this dissertation.

### 5.3 MEASURING NATIVELIKENESS

The primary purpose of this study was to measure nativelikeness among school bilinguals, with the goal of determining the effect of full-immersion schooling on ultimate

attainment in both the L1 and the L2. The analysis of the results revealed that measuring nativelikeness is no simple or straightforward matter, and that the conclusions that can be drawn about nativelikeness depend on what specific indicators are taken as a basis and what bar is set for nativelikeness. The analysis of the results included a look at two different indicators: group means by condition, and the individual performance of school bilinguals and heritage speakers relative to the minimum performance found among the native control groups, again by condition. Additionally, the conclusions that could be drawn about nativelikeness depended on what was set as the minimum requirement for nativelikeness. In the case of group results, was it required to pattern like or outperform the native controls on every single measure or every single condition? In the case of individual results, was it required to equal or exceed the minimum native-control performance on every single condition?

Abrahamsson and Hyltenstam (2009) administered a written Grammaticality Judgment Task (GJT) that tested four different morphosyntactic features of Swedish: subject-verb inversion, reflexive possessive pronouns, placement of sentence adverbs in relative clauses, and gender and number agreement. Although four different grammatical areas were targeted, the results of the entire GJT were considered as a whole; the written Grammaticality Judgment Task was treated as a single measure. Since the GJT targeted four different grammatical areas, looking at the total scores could have been misleading. The task consisted of 80 sentences, and participants received a score of 1 for each accurately rated sentence, for a maximum possible score of 80. Since the sentences represented four different grammatical areas, a participant's total score for the task did not reveal how the participant compared to the native controls on each individual grammatical area. It is conceivable, for example, for a participant's score to have been higher than the native-control minimum (57/80), but lower than the native-control minimum on

one of the four areas. Based on Abrahamsson and Hyltenstam (2009)'s scoring method, which assigned, for the written GJT, a nativelikeness score of 1 to each participant whose total score was equal to or higher than the native-control minimum score, this participant would have been considered nativelike on this task, when in fact their performance fell below that of the lowest-scoring native control on one grammatical area. To avoid this issue, it would have been preferable to consider each grammatical area separately. This study even went one step further by considering, within each measure, each *condition* separately, based on the same rationale. Just as the items within each GJT were designed to target different grammatical areas, the items targeting each grammatical area were designed to represent different conditions. Considering each condition separately constitutes the most fine-grained analysis and thus the most accurate indicator of nativelikeness.

Another important question is whether to compare a target population's group mean to that of a native control group, or whether to consider individual scores and compare them to the native-control minimum or maximum. In this study, the first step of analysis consisted of the former method, as is traditionally done in SLA studies. In analyzing nativelikeness by participant, the analysis followed the method adopted by Abrahamsson and Hyltenstam (2009), whereby a participant's performance did not need to be at or above, or within a certain standard deviation of, the native-control mean, but equal to or higher than the lowest native-control performance. The latter is a more sensible approach for the simple reason that even a native speaker who is part of the native-control group itself may fail to meet a nativelikeness criterion based on the group mean and a certain standard deviation. Since it is unreasonable to assume that a native speaker is not nativelike, and unfair to deem non-nativelike a participant who outperformed one of the native speakers, the lowest native-control performance must be included

within the range in which participants can fall and be deemed nativelike. Otherwise, a participant who outperforms the lowest-performing native control but fails to score within a certain standard deviation of the native-control mean would be unfairly deemed non-nativelike, a problem described by Vanhove (2020).

Ultimately, however, what is concluded about nativelikeness depends on what bar is set for nativelikeness, i.e., in this study, for the nativelikeness scores, how many conditions a participant needed to have received a nativelikeness score of 1 on, or what minimum score out of 18 (for English) or 17 (for Arabic) a participant needed to have earned, in order to be considered nativelike. According to Abrahamsson and Hyltenstam (2009), nativelikeness is a binary phenomenon “by definition,” like marriedness or deadness (p. 267). Of the 41 L2 speakers they tested, they only considered the two or three that performed within the native-control range on all 10 measures to have exhibited “actual, linguistic nativelikeness” (p. 287), excluding even the five who performed within the native-control range on eight or nine measures. Thus, for them, scoring below the native-control range on even one of 10 measures was sufficient to consider a participant non-nativelike, and, since they considered nativelikeness a binary phenomenon, such a participant was no different, in terms of non-nativelikeness, from a participant who did not score within the native-control range on any of the 10 measures.

Abrahamsson and Hyltenstam’s (2009) approach to classifying L2 speakers as nativelike or non-nativelike is problematic for a number of reasons. As with any study, the control group was a single sample of native speakers (15 in their case), and the study consisted of a limited number of tasks testing a limited number of features of the language; ultimately, there is an unavoidable degree of arbitrariness involved in the design and methodology of such studies. There is nothing to say that had they included more native controls (say, an additional 15), there

would not have been at least one who performed below the lowest-scoring native control on one or more measures, thus possibly moving some of the L2 speakers from the “non-nativelike” to the “nativelike” category according to their criteria.

This problem is addressed by Vanhove (2020), who aptly points out that “even if nativelikeness is a binary phenomenon, lack of data quantity or quality may make it impossible to assess which category a given L2 speaker falls into” (p. 722). Furthermore, binary approaches to nativelikeness are themselves controversial. Gries and Wulff (2021), for example, looked at native and nonnative English speakers’ preferences with regard to the positioning of finite adverbial subordinate clauses either before or after the main clause, as in *Because he didn’t eat much, Max is hungry* (which they refer to as SM) and *Max is hungry because he didn’t eat much* (which they refer to as MS). They observe that under a binary approach, if the probability of a native speaker using SM is predicted to be above 50%, a nonnative speaker who used MS, the other word order, would be classified as non-nativelike whether the percentage predicted for native speakers is 51% or 99%, even though in the former case the two word orders were almost equally likely whereas in the latter case the word order chosen by the nonnative speaker was extremely unlikely. They rightfully point out that it is problematic to use the same label of *non-nativelike* to classify both a nonnative speaker who chose the word order that was 49% likely to be chosen by native speakers and one who chose the word order that was only 1% likely to be chosen by native speakers.

Numerous studies have shown that there is significant variability among prototypical L1 speakers, and in this study, some of the native controls even performed at floor on some conditions. In such cases, it is common to assume that this is not due to any problems with linguistic competence, but could have been due to task effects, problems with the task design



and/or the instructions, and/or performance errors as opposed to competence errors.

Abrahamsson and Hyltenstam (2009) do not consider the possibility that some of the “close to maximum” nativelikeness scores (8 or 9 out of 10) in their study could have also been due to task effects, problems with the task design and/or the instructions, and/or performance errors as opposed to competence errors (i.e., things that could equally affect native controls). As was shown in the group results of this study, for some conditions the school bilinguals actually *outperformed* the native controls. It stands to reason that outperformance of native controls should be given due consideration, as is given to underperformance of native controls, and that outperformance should not be downplayed compared to underperformance.

If an L2 groups' performance is significantly lower than that of a native-control group on a small number of tasks or linguistic areas, perhaps the L2 group's ultimate attainment is in fact nativelike and the learning mechanism is not defective, and the results observed indicate that there is some amount of within-group variability across tasks or linguistic areas within *both* groups, with one group outperforming the other on a small number of tasks or linguistics areas and vice versa for any number of reasons that are not related to ultimate attainment, linguistic competence, or the optimality of the language learning mechanism. Similarly, if a given L2 participant has not achieved a maximum nativelikeness score (for example, earning an English nativelikeness score below 18, in this case of this study), but their nativelikeness score is close to the maximum (say, 16 out of 18), this departure is not necessarily incompatible with nativelikeness or indicative of incomplete ultimate attainment, insufficient linguistic competence, or a defective language learning mechanism. Assuming a rigid idealized target based on a specific sample and a specific choice of tasks and linguistic areas seems to be an oversimplification that carries the risk of inaccurate conclusions.

In a similar vein, Birdsong (2005) suggests that with enough tasks and enough measures added to the “nativeness criterion” (p. 322), the goalposts of nativeness can be moved far enough to find some reason to reject nativeness for each and every L2 learner. He gives two hypothetical examples to demonstrate his point: a hypothetical L1 speaker of English and L2 speaker of French who has demonstrated nativelike performance on a battery of measures spontaneously says “Ouch!” rather than “Aïe!” as a kneejerk reaction to sudden pain, and forms the non-existent form *diamétricalement*, instead of *diamétralement*, a low-frequency lexical item, by influence of the English *diametrically*. Birdsong reasonably argues that these two departures from the expected performance of the prototypical native speaker should not be taken as evidence that this L2 speaker’s language learning mechanism is faulty; in his words, “reasonable limits on the use of this type of evidence should be imposed” (p. 322). Abrahamsson and Hyltenstam (2009) analyzed 10 out of 20 measures that were included in their study; perhaps if they had analyzed the other 10, the two or three participants that met their nativeness criterion based on 10 measures may have failed to do so based on all 20.

Of course, an important consideration is what those reasonable limits should be. How much leeway should be allowed when it comes to close-to-maximum nativeness scores? Just how far can the bar be lowered before abandoning the possibility of nativeness? While it may be difficult or impossible to identify a single new threshold that will be consistently reliable, it seems that a certain amount of leeway is warranted, and that not allowing any leeway whatsoever runs the very real risk of unfairly or hastily classifying at least some L2 speakers as non-nativelike. Similarly, while it may be tricky to determine which measures (such as spontaneous reactions to pain or the formation of low-frequency lexical items) should not be reasonably considered in evaluating nativeness, it is important to keep the concept itself in mind and to

think twice before immediately classifying as non-nativelike an L2 speaker who met a strict nativelikeness criterion on all but one of 10 measures, for example.

#### 5.4 INDIVIDUAL VARIATION

Overall, there was very little individual variation within either the group of school bilinguals or the group of heritage speakers, as indicated by the standard deviations of their nativelikeness scores, which were 1.03 (school bilinguals, English), 1.08 (school bilinguals, Arabic), 1.84 (heritage speakers, English), and 1.65 (heritage speakers, Arabic). (As discussed above, the small amount of individual variation among the school bilinguals may indicate that H2 is disconfirmed.) The study tested for 128 possible correlations between nativelikeness scores and individual variation in language use and exposure, socioaffective factors, and language aptitude, and only 7% of the correlations tested for were found to be significant. Furthermore, of those few significant correlations, only correlated in the expected direction for the school bilinguals. It is possible that the very small number of correlations is due to the limited individual variation and/or to the relatively small sample sizes. Another reason may be the design of the instruments that were used to measure language use and exposure, language aptitude, and socioaffective factors (the linguistic questionnaire and the language aptitude test).

The linguistic questionnaire relied on participants' own estimates of their language use and exposure, and their own evaluations of intangible socioaffective phenomena. In a study on the acquisition of formulaic sequences in English, Schmitt et al. (2004) administered a questionnaire intended to measure language attitudes and motivation. The questionnaire was similar in design to the one used in this study to measure socioaffective factors. Participants were asked to indicate the extent to which they agreed or disagreed with a number of statements, on a six-point scale ("Strongly disagree," "Disagree," "Slightly disagree," "Partly agree," "Agree,"

and “Strongly agree”). The authors did not find any statistically significant correlations between the results of the questionnaire and participants’ performance on the tests measuring knowledge of formulaic sequences. They observe that this is surprising since attitude and motivation have otherwise been demonstrated to correlate with language learning outcomes, and they speculate that their findings in this case may be due to the influence of other factors related to the learning context (p. 69).

They do not entertain the very real possibility that the lack of statistical significance they found was due to the design of the instrument. Attitude and motivation, as well as other socioaffective factors, are intangible and difficult to measure. In their questionnaire as well as the one administered in this study, participants were asked to quantify subjective feelings and perceptions, and their responses may not have been truly or fully reflective of those feelings and perceptions for a number of possible reasons. Participants may have found it difficult to select an appropriate rating and chosen one that did not reflect their true feelings or perceptions, or they may have been unable to appropriately rate those feelings and perceptions to begin with. Additionally, in this study, participants were asked to reflect not only on their feelings and perceptions since graduation from high school, but also their feelings and perceptions during schooling, and they may not have always been able to remember how they felt back then. Finally, in both studies, perhaps the questionnaire should have included more variables, a larger number of items per variable, and/or different statements in some cases, since some of the statements chosen may not have truly tapped into the factors they were intended to tap into.

Schmitt et al. (2004) state that they took care to avoid making the questionnaire too long and thus sacrificed comprehensiveness for the sake of brevity, so they limited their selection of variables to a small number that they considered “particularly relevant to the project” and “which

have been found to play a central role in determining L2 learning behaviours and effort” (p. 59). Appendix 3 lists 25 statements (as well as the instructions), and Table 1 lists six variables and their distribution across 18 statements.<sup>25</sup> Of the variables listed in Table 1, one (integrativeness) is reported to have corresponded to six questionnaire items, and all of the other five (attitudes toward L2 learning, instrumentality, language use anxiety, commitment to learn English, and intended effort) are reported to have corresponded to one to three questionnaire items only. It is possible that the questionnaire did not include enough variables and/or enough items to satisfactorily measure the factors it was intended to measure. In SLA research, six items per condition is usually targeted as the absolute minimum, and in this case, not all of the variables corresponded to six items.

In this study, each factor corresponded to 10 statements, but perhaps not every statement was suitable to measure the factor it was intended to measure, and perhaps more variables should have been included. Other possible factors that could have impacted participants’ responses in both studies are fatigue, inattention, and mistaken selections, among others. In sum, measuring socioaffective factors poses numerous methodological challenges, so the lack of statistically significant correlations should not be taken to mean that the factors of interest had no impact. Similar considerations apply to the portion of this study’s linguistic questionnaire designed to measure language use and exposure, so it may be that the linguistic questionnaire administered in this study was not (fully) valid.

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<sup>25</sup> It was not clear to me whether the questionnaire included the 25 statements in Appendix 3 or the 18 statements referred to in Table 1. According to one of the authors, “I image [*sic*] what happened is that we included 25 items on the questionnaire, but then ran a reliability analysis on those items once the data was collected. Based on that analysis, items with good performance were kept for use in the subsequent analyses in the study, and poorly-performing items excluded. The distribution across variables is shown in Table 1” (N. Schmitt, personal communication, March 19, 2021). Examples of statements included in Appendix 3, which may or may not have been included in the final analysis, are *The more I learn about British people, the more I like them*; *I really enjoy studying English*; and *I really like the English culture*.

Regarding the language aptitude test, recent research suggests that with the possible exception of LLAMA\_B, the LLAMA tests may not be internally valid (Bokander & Bylund, 2020). Schmitt et al. (2004) administered a 14-item language aptitude test similar in some ways to the LLAMA\_F test. In both cases, participants were tested on their acquisition of some grammatical features of an artificial language. In this study, there were 20 questions asking participants to match a picture with one of two sentences in the artificial language, while in Schmitt et al. (2004)'s study, there were 14 questions asking participants to match an English sentence with one of four sentences in the artificial language (see Appendix 2 for the instructions and items). As with their questionnaire designed to measure attitude and motivation, they did not find any statistically significant correlations between the results of the language aptitude test and participants' performance on the tests measuring knowledge of formulaic sequences, so it is possible that their language aptitude test was not (fully) valid.

Of the three socioaffective factors tested in this study, language aptitude was the only one in which all correlations found (two out of two) correlated in the expected direction. For the heritage speakers, the LLAMA\_F scores correlated positively with English nativelikeness scores, and the LLAMA\_B scores correlated positively with Arabic nativelikeness scores. For the school bilinguals, no correlations were found between language aptitude scores and nativelikeness scores in either language. It is possible that the language aptitude test was not (fully) valid and that the correlations found for heritage speakers were not meaningful. Another possible factor is that there was even less individual variation within the school bilingual group than within the heritage speaker group, with standard deviations of 1.03 and 1.08 for school bilinguals, and 1.84 and 1.65 for heritage speakers.

However, there are other possible explanations that can be entertained. One possible explanation for the fact that the LLAMA\_B scores correlated with the heritage speakers' Arabic nativelikeness scores and not those of the school bilinguals is related to lexical proficiency. LLAMA\_B tested vocabulary learning, and it is possible that since the heritage speakers had had far less exposure to Arabic than the school bilinguals, the heritage speakers' lexical proficiency was probably much lower and more heterogeneous, with considerable variation within the group. Under these circumstances, it is possible that those heritage speakers with higher performance on LLAMA\_B had higher lexical proficiency and thus had higher performance on the Arabic tasks because they were more comfortable with the lexical items used. The school bilinguals, on the other hand, had had far more naturalistic exposure to Arabic and probably had fairly uniform, and advanced, lexical proficiency in Arabic.

One possible explanation for the fact that the LLAMA\_F scores correlated with the heritage speakers' English nativelikeness scores and not those of the school bilinguals is related to each group's English acquisition experience. LLAMA\_F tested grammatical inferencing skills. The school bilinguals' English acquisition environments were fairly similar, since they had all received the majority of their schooling at the same school and had not had English as their home language or their societal language during their formative years. On the other hand, the heritage speakers' English acquisition environments were much more heterogeneous, since they had had English as a societal language during their formative years, their places of residence during those years were more diverse,<sup>26</sup> and they could not have all received the majority of their schooling at the same school. Thus, it is possible that those heritage speakers with more advanced grammatical inferencing skills had attained higher English proficiency.

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<sup>26</sup> This is based on data collected on participants' places of residence throughout their lives, which is not reported in this dissertation.

In any event, this study's results seem to disconfirm H2 and H3, although the situation with H3 is not fully clear. RQ3 and H3 were formulated based on H2; since H2 was (largely) disconfirmed, considering whether H3 was confirmed or disconfirmed is effectively a moot point.

## 5.5 DOMINANCE

The results of the EITs provided a very clear picture of dominance. The school bilinguals seemed to be balanced across the two languages, while the heritage speakers were clearly dominant in English. Thus, H5 is disconfirmed. While the EITs, which were designed to measure dominance, were not specifically designed to measure nativelikeness, a look at the group means sheds some light on nativelikeness among the school bilinguals and the heritage speakers. With the exception of the heritage speakers' performance in Arabic (with a mean accuracy score of 58%), all groups performed at ceiling across both tasks (with mean accuracy scores between 98% and 100%). This suggests that the school bilinguals patterned like both native control groups, the heritage speakers patterned like the English native control group but underperformed the Arabic control group, and the school bilinguals patterned like the heritage speakers on the English task and outperformed the heritage speakers on the Arabic task. These results provide further support for the conclusion that the school bilinguals were nativelike in both languages and that the heritage speakers were nativelike in English and non-nativelike in Arabic.

The results of the EITs provide strong support for this type of task as a powerful measure of language proficiency. If the heritage speakers had performed at ceiling on the Arabic task, all groups would have performed at ceiling across both tasks and one may have suspected that the EITs were not demanding enough to probe advanced language proficiency or nativelikeness, but the heritage speakers' performance on the Arabic task suggests otherwise. The two tasks were



carefully designed to be very comparable to each other, and the fact that the two groups of native controls patterned similarly to each other, with no statistically significant difference between the two, suggests that the two tasks were in fact largely comparable. With this in mind, the heritage speakers' at-ceiling performance on the English task suggests that their non-targetlike performance on the Arabic task was not due to any trouble they may have had completing the task itself.

Unlike the TVJTs and the GJTs, the stimuli and responses for the EITs were purely oral, eliminating any possible issues related to reading or writing Arabic, which could have placed the heritage speakers at a disadvantage compared to English regardless of actual proficiency. Another important way in which the EITs differed from the TVJTs and the GJTs is that the EITs tapped into production. Production is known to be more challenging and difficult than comprehension; this, combined with the design of the tasks and the results that were found, suggests that the EITs were particularly reliable and accurate indicators of language proficiency, natelikeness, and dominance. It is particularly remarkable that these persuasive patterns emerged despite the relatively short length of the sentences in both languages. It has been previously found that for EITs, complexity matters more than length, and this has been corroborated by the results of this study.

Montrul (2015) points out that dominance is rarely measured, but more often estimated based on different indicators, such as the results of proficiency measures, self-reports about language history, or self-ratings of language skills. If the proficiency measures used to test proficiency in each language are not comparable, then using their results as an indicator of dominance may be misleading. This is an issue raised by Treffers-Daller (2015). Self-reports and self-ratings, as discussed above, may not be accurate. Montrul (2015) suggests that one way to

measure dominance is to combine proficiency measures in each language with a language background questionnaire targeting quantifiable information on language use.

The EITs used in this study were designed with the goal of measuring, not estimating, dominance. As mentioned above, they were designed in such a way as to be as highly comparable to each other, since the goal was to use their results as indicators of dominance, and a comparison of two native control groups' performance lends support to the idea that the two tasks were comparable. The data collected in this study on self-rated language proficiency (see the fifth and sixth tables in Appendix G) and language use and exposure (see the first table in Appendix H), while not collected specifically with the goal of estimating dominance, could be considered from this lens.

On a scale of 1-11, the school bilinguals' mean self-rated proficiency was 10.94 for English and 10.56 for Arabic. For heritage speakers, the means were 10.95 and 6.86, respectively. Of the 16 school bilinguals, six (38%) gave a higher rating to English than to Arabic, one (6%) gave a higher rating to Arabic, and nine (56%) gave equal ratings to both languages. Of the 22 heritage speakers, 21 (95%) gave a higher rating to English and one (5%) gave equal ratings to both languages. These indicators, which could be considered potential estimates of dominance, align very strongly with the results of the EITs. The heritage speakers rated their English proficiency much higher than their Arabic proficiency, and almost all of them gave a higher rating to English than to Arabic. The school bilinguals, on the other hand, rated their proficiency in both languages almost equally, and over half of them gave equal ratings to both languages.

The global language use and exposure scores given in Appendix H are on a scale of -3 to 3, with 3 indicating exclusive use of and exposure to English, -3 indicating exclusive use of and

exposure to Arabic, and 0 indicating equal use of and exposure to both languages. The scores were calculated by activity (speaking, listening, reading, and writing), by stage of life (birth until the start of schooling, kindergarten and elementary school, middle school / junior high school and high school, and post-high school), and by setting (home, school, and outside home and school). The mean global scores for the school bilinguals and the heritage speakers, respectively, were 1.38 and 2.42 (activity), 0.74 and 1.97 (stage of life), and 0.85 and 1.75 (setting). These results, which could also be considered potential estimates of dominance, also align with the results of the EITs. Although all six scores were above 0, indicating greater use of and exposure to English, each of the school bilinguals' scores was closer to 0 (i.e., closer to equal use of and exposure to both languages) than the corresponding heritage speaker score. Thus, in this study, the EITs, which were used to measure dominance, and the indicators that could potentially be used to estimate it provide a consistent picture of dominance.

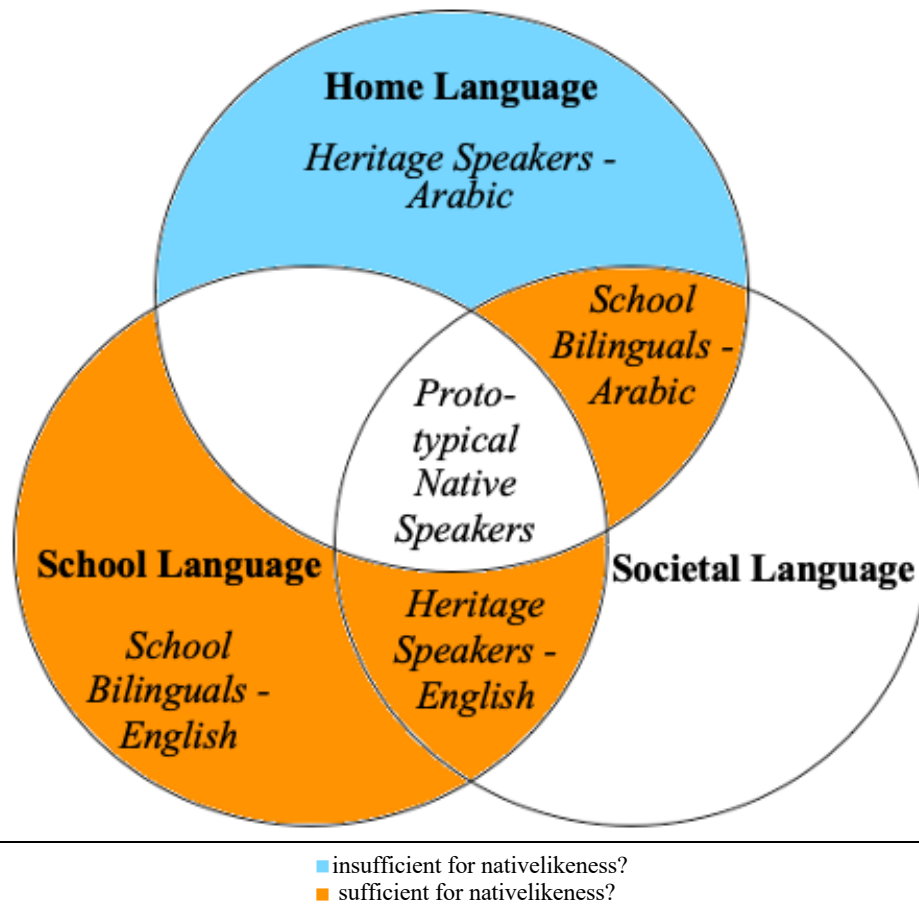
## 5.6 OTHER CONSIDERATIONS

The main impetus for conducting this study was an interest in identifying whether full-immersion schooling can or does lead to L2 nativelikeness. Unlike the pilot study results, the results of this study strongly suggest that full-immersion schooling not only can but in fact *does* lead to L2 nativelikeness. Additionally, the results of this study, again unlike those of the pilot study, suggest that putting aside reading and writing skills and, in the case of Arabic, MSA skills, full-immersion schooling even leads to L2 nativelikeness at no (great) loss to the L1. It was also observed that the school bilinguals generally outperformed the heritage speakers in both languages across both indicators: considering group means, school bilinguals outperformed heritage speakers on 9 of 18 English conditions (50%) and on 11 of 17 Arabic conditions (65%), while the heritage speakers did not outperform the school bilinguals on any conditions except

one Arabic condition (6%); and considering nativelikeness scores by participant, the school bilinguals had higher mean nativelikeness scores in both languages (English 17.44 vs. 16.45; Arabic: 16.31 vs. 14.55). Additionally, the school bilinguals clearly outperformed the heritage speakers on the Arabic EIT, a more powerful indicator of language proficiency.

All of this seems to suggest that unlike many other bilingual environments, including that of typical heritage speakers, full-immersion schooling has much better chances of leading to a combination of L2 nativelikeness and bilingual balance, where school bilinguals can have their cake and eat it too. In other words, the patterns observed suggest that school bilinguals are more likely to experience what (Lambert, 1981) describes as *additive bilingualism*, a form of bilingualism whereby the learning of the second language does not necessarily “portend the slow replacement of the first,” whereas heritage speakers are more likely to experience *subtractive bilingualism*, a form of bilingualism “experienced by ethnolinguistic minority groups who...feel forced to put aside or subtract out their ethnic language for a more necessary and prestigious national language” (p. 12) and that overall, the aggregate combined linguistic knowledge of school bilinguals (in both languages) exceeds that of heritage speakers, suggesting that if the L1 is the home language and the L2 is the school language, it is overall more advantageous to have the L1, rather than the L2, as the community language. Another possible conclusion is that, as visually represented in Figure 11, if one of the two languages of a bilingual is only the home language, this is unlikely to be sufficient for nativelikeness, whereas if it is only the school language or a combination of societal language and one of the other two, this is likely to be sufficient for nativelikeness.

**Figure 11:** Possible Relationships between Nativelikeness and Setting of Language Use and Exposure



The picture that emerges has a number of important implications. In general, it seems intuitive to many people that heritage speakers would be nativelike in their L2, while many people intuitively expect the opposite for school bilinguals. SLA research supports these intuitions about heritage speakers, while not providing much in the way of either confirmation or refutation of the intuitions about school bilinguals. The patterns that have emerged from this study suggest that there may be a certain lack of awareness about the probability of L2 nativelikeness among school bilinguals. If it is true that full-immersion schooling is just as likely as a heritage-speaker environment to lead to L2 nativelikeness, then this is a finding of crucial

importance and constitutes nothing short of a breakthrough in our understanding of the impact of the school language and the societal language on ultimate attainment and nativelikeness. It could be the case that for nativelikeness, it is sufficient for the language to be the school language only, and that additionally having that language as the societal language before adulthood may not make much of a difference in terms of nativelikeness. It is also crucial that the school bilinguals in this study exhibited largely homogeneous nativelikeness patterns despite individual variation in length of residence in English-speaking countries following graduation. This suggests that just as for heritage speakers it does not seem to make a difference for nativelikeness to have the school language as the societal language as well, it may also not make a difference for a school bilingual to have the school language as the societal language after graduation.

Another crucial implication of this pattern relates to the L1. Research consistently shows, as this study has also shown, that heritage speakers are mostly not nativelike in their L1, so it seems fairly clear that for nativelikeness, it is not sufficient for the language to be the home language only. This, too, is something that many people intuitively expect. For school bilinguals, many people intuitively expect that school bilinguals *are* nativelike in their L1 but not in their L2. Few people would expect school bilinguals to be nativelike in both languages: intuitive expectations of nativelikeness in two languages are mostly limited to simultaneous bilinguals. If, however, it is true that school bilinguals consistently achieve balanced bilingualism, then this, too, is a crucial finding bearing on our understanding of the impact of the home language and the societal language on ultimate attainment and nativelikeness. It could be the case that for nativelikeness, while it is not sufficient for the language to be the home language only, additionally having the language as the societal language, but not the school language, until

adulthood makes the difference, even though it may not make much of a difference if the other setting in which that language is predominant is the school and not the home.

In addition to their importance for the fields of SLA and bilingualism, these observations are also of practical importance as they may help inform decisions about schooling and immigration. Anyone who is interested in promoting L2 nativelikeness and/or balanced bilingualism would be interested in knowing the probable ultimate attainment outcomes of full-immersion schooling and a heritage-speaker setting, respectively.

Nevertheless, it is too soon to speak of a breakthrough. The situation is more complex than may meet the eye, and for a number of reasons, the possible conclusions discussed above should not be adopted too hastily. The results of this particular study may not necessarily be generalizable, since the study tested only one sample from one school, and there has otherwise been very little research on full-immersion schooling, so there is not much else to consider in drawing broader conclusions. Furthermore, this study tested a select number of linguistic areas, and the results may not be generalizable to other linguistic areas. Any study on nativelikeness must take care to avoid ceiling effects. In this study, ceiling effects were unlikely, since, as was mentioned earlier, in the norming study none of the L2 speakers performed within the native-control range on all five measures that constituted the TVJTs and the GJTs, even though many of the L2 speakers were advanced. Still, no single study can measure all aspects of language, and it is possible that we would see different patterns if we tested more complex linguistic areas. In attempting to determine what linguistic areas are complex enough to suitably measure nativelikeness, there are a number of factors to consider, such as frequency and saliency, among others. Thus, this study's contribution to an understudied area, which is one of its strengths, is also a weakness when it comes to drawing conclusions. There are a number of important

elements that should not be overlooked and may impact the generalizability of this study's results.

One important element is language status and prestige. Across the non-English-speaking world, English is generally perceived as a prestigious language, and English proficiency is perceived as a highly valued asset and the ticket to numerous opportunities. Many L2 learners of English struggle in their compulsory English classes as part of their primary schooling, and display great admiration towards highly fluent and proficient L2 speakers of the language. These factors may have played a role in motivating the school bilinguals who participated in this study to learn, maintain, and identify with English, thus favoring successful acquisition. Additionally, their school was a private school with a US curriculum, and positive perceptions of private education and the United States may have further contributed to positive identification with, and thus more successful acquisition of, the English language. Furthermore, the widespread availability and popularity of English-language media such as movies and music meant these school bilinguals would have been exposed, to varying degrees, to English-language input outside the school setting. In sum, all L2s are not created equal, and the fact that in this case the L2 was English, and not a different language, most likely played an important role in acquisition.

In contrast, the minority language in the case of the heritage speakers was Arabic, not English. In every respect discussed above, Arabic differs significantly from English. Arabic does not enjoy the almost universal prestige English enjoys or the perception that Arabic proficiency is a highly beneficial skill to strive for, nor was it associated, in the heritage speakers' case, with higher socioeconomic status or a favorably viewed country or region. Of course, Arabic media is also not extensively consumed in the United States. Additionally, colloquial Arabic is often undervalued and dismissed, by both native speakers and others, as not being a real language, not



having any rules or structure, and/or not being worthy of learning. These factors mean that the minority language the heritage speakers were contending with was a markedly different animal from the one the school bilinguals were learning. Inevitably, this must have had consequences on the heritage speakers' acquisition of Arabic. The negative perceptions of colloquial Arabic may have also had an impact on the school bilinguals, motivating them to identify less with colloquial Arabic and more with English.

Perceptions of Arabic by those who do not speak the language often fall under one of three categories. Due to the status of Arabic as the language of Islam, many non-Arabic-speaking Muslims have a highly positive perception of the language and consider it holy or sacred. Others associate Arabic with terrorism and anti-western values, while still others do not make value judgments about the language but consider it highly difficult to learn. Depending on each heritage speaker's perceptions of Arabic, those perceptions may have played a motivating role, a demotivating role, or not much of a role at all. The other two perceptions would have likely played a demotivating role, thus further hampering acquisition. As with English, the fact that the *other* language in this study was Arabic, and not any other language, undoubtedly affected acquisition.

This invites questions about whether we can expect full-immersion schooling to lead to the same outcomes when the medium of instruction is not a prestige language like English. What types of ultimate attainment could we expect among school bilinguals at an Arabic-medium full-immersion school in the United States? How likely would it be to see Arabic nativelikeness among L1-English school bilinguals schooled at this school compared to L1-Arabic school bilinguals schooled at an English-medium full-immersion school in an Arabic-speaking country?

In other words, does this model only work when the medium of instruction is a prestige language? Further research could help answer these questions.

Another aspect to consider is the role of active language use (speaking and writing). Swain (1998) looked at French immersion students and found that in French, their passive skills were nativelike but their active skills were not, leading her to formulate the Output Hypothesis, which posits that active language production is an important part of successful language acquisition (Swain, 2005). With the exception of speaking at home and speaking outside home and school, all of the school bilinguals' language use and exposure scores for speaking and writing at school<sup>27</sup> were positive,<sup>28</sup> indicating greater use of English. Their scores for writing were 0.50 and 0.81<sup>29</sup> (at home), 0.69 and 0.78 (at school outside class<sup>30</sup>), and 0.44 and 0.71 (outside home and school). Their scores for speaking were -0.44 and -0.35 (at home), 0.47 and 0.55 (at school in class), 0.03 and 0.25 (at school outside class), and -0.35 and -0.06 (outside home and school). Thus, overall, the school bilinguals' active use of English during school was extensive, and this factor may have played a significant role in favoring nativelikeness in English. If the school bilinguals had not used English extensively during schooling, we may have obtained different nativelikeness results.

## 5.7 FULL-IMMERSION SCHOOLING AND NATIVELIKENESS

As the above discussion shows, the phenomenon of nativelikeness among school bilinguals is complex, and the attempt to determine the relationship between nativelikeness and full-immersion schooling is no mean feat, given that there are so many other relevant factors to

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<sup>27</sup> These scores are not specifically reported in Appendix H.

<sup>28</sup> The lowest possible score was -1, and the highest possible score was 1.

<sup>29</sup> In each pair of scores, the first score refers to kindergarten and elementary school, and the second score refers to middle school / junior high school and high school.

<sup>30</sup> The questionnaire did not ask about writing at school in class, since it was assumed that the majority of this was in English.

consider. Nevertheless, the results analyzed for this study do lend strong support to the idea that at least in some cases, full-immersion schooling can lead to L2 nativelikeness and balanced bilingualism.

Although the school bilinguals' *performance* was not always targetlike compared to that of the native controls (depending on what criterion was used), the departures from targetlike performance were minimal enough to not constitute a serious argument against nativelike *competence* and fully operational language learning mechanisms. Rather, it seems much more plausible that those departures are due to other factors, such as inevitable L1-L2 interactions, task effects, and/or the particular sample of native controls used in this study. Even the performance of prototypical native speakers is not always targetlike, so it is important to keep the distinction between performance and competence in mind. When a great percentage of performance is non-targetlike, we can reasonably conclude that this is in fact indicative of insufficient competence, but when the percentage is minimal, we must be wary of jumping to the hasty conclusion that this is indicative of non-targetlike competence. As discussed in Chapter 2, when data from a particular sample of native controls is taken as a rigid benchmark in an oversimplified manner that glosses over crucial nuances, this can lead to hasty observations that can in turn lead to misleading conclusions.

This suggests that while nativelikeness is rare in most cases of late L2 acquisition, it may not be particularly rare in the case of school bilinguals, who, like heritage speakers, are early L2 learners. There may be more individuals with L2 nativelikeness than we are aware of, because school bilinguals have not received enough attention by nativelikness researchers. Further research in this area is clearly warranted. In addition to L2 nativelikeness, two other important aspects of the patterns observed in the analysis of this study's results are those related to L1

nativelikeness and those related to how school bilinguals compare to heritage speakers. It is striking that the results suggest that L1 nativelikeness is compatible with full-immersion schooling and L2 nativelikeness in that setting, and that, as was suggested particularly powerfully by the EITs, full-immersion schooling confers advantages compared to a heritage-speaker setting when it comes to a bilingual's aggregate linguistic proficiency in the two languages. Situations in which L2 nativelikeness does not come at the expense of L1 nativelikeness—in other words, situations of balanced bilingualism—are exceptionally rare, so it is important to further investigate the extent to which full-immersion schooling can increase the likelihood of this outcome. Probing further into the comparison between school bilinguals and heritage speakers is also important insofar as it can shed further light on the role of the societal language in these two settings. This, in turn, can have important implications for the decisions of parents interested in educating their children in a full-immersion setting and helping them achieve maximal proficiency in both the L1 and the L2: if they have the choice, should these parents bring up their children in an environment in which the L1 or the L2 is the widespread societal language? Further research will provide more insight into these questions.

Neither school bilinguals nor heritage speakers are prototypical native speakers of any language, so questions related to L1 nativelikeness, L2 nativelikeness, and how the two groups compare with each other with regard to these two things are of crucial importance for the fundamental questions of what defines a native speaker and what it takes to have native or nativelike competence in a language. These questions have major implications for the academic study of second language acquisition and bilingualism; education and language instruction; personal and social identity; and considerations related to employment decisions. There is no simple one-to-one mapping between a person's linguistic background and their ultimate

attainment in the different languages they may speak, so we must take care to avoid inaccurately branding as non-nativelike individuals who may in fact have nativelike competence in the language in question.

For these reasons, it will continue to be important to carefully consider and refine the tools used in this kind of research to measure nativelikeness. Research-based conclusions and claims about nativelikeness outcomes should not be taken lightly, as they have important theoretical and practical implications. Theoretically, the more confident we can be about the claims we make regarding nativelikeness in different settings, the better we can understand and deconstruct the notion of the native speaker, which has been increasingly problematized in recent years and is the focus of an upcoming *Frontiers in Psychology* Research Topic. Practically and socially, if we can confidently claim that full-immersion schooling promotes L2 nativelikeness and lifelong balanced bilingualism, we will need to consider, among other things, whether such an opportunity is universally accessible. Full-immersion schools tend to be private schools with high enrollment costs that are prohibitive for parents whose income is below a certain level. If, in certain communities, they are the only path to L2 nativelikeness and balanced bilingualism, scholarships and donations may be needed to promote equal education access.

## 5.8 DIRECTIONS FOR FURTHER RESEARCH

There are a number of research paths that suggest themselves as ways of building on this research. It would be enriching to analyze the results of the EPTs and the FPTs that were administered as part of this study but whose results were not analyzed for this dissertation. Analyzing further data from the same participants stands to be of benefit by providing a fuller and deeper picture of their language proficiency. It would also be useful to expand this study by running it with other populations, such as late transfers to the same school, and prototypical L2

learners of English who were schooled at an Arabic-medium school in Jerusalem, to attempt to tap into the effects of age of onset, type of input, and amount of input on this study's target population.

Of course, it would also be helpful to run further studies either with the same participants or with new populations of school bilinguals; to that end, it would be helpful to consider what instruments and linguistic areas might be best suited to measure nativelikeness, and adjust the design of this study accordingly. In this study, the EITs proved particularly powerful, so it may be worthwhile to consider increasing the use of this instrument, and possibly use it to target specific linguistic areas that may be particularly suited to investigating nativelikeness. With regard to individual variation and what factors may be responsible for it, it seems important to take a closer look at the tools that were used in this study to identify individual variation correlates, and modify or replace them as appropriate with the aim of effectively identifying such correlates.

As school bilinguals are a relatively understudied population of bilinguals, it would be instrumental to replicate this study or variations of it with other populations of school bilinguals, including different schools, different language pairs, and/or different locations. For example, the Lycée Français de Jérusalem is a French-medium school in Jerusalem, and some of the graduates of this school are L1 speakers of Palestinian Arabic, like the target population in this study. Running a study similar to this one with these school bilinguals would provide an interesting comparison group, since the main difference between the two groups would be the language of schooling. Another interesting comparison group would be school bilinguals with the same language pair but who attended a different school, such as the Amman Baccalaureate School, an English-medium school in Amman, Jordan. To try to tap into the role of prestige, it could prove

enlightening to investigate nativelikeness in French among school bilinguals schooled at a French-medium school in North Africa, for example. A particularly promising variation of this study could be one comparing school bilinguals from four different schools: both an English-medium school and a French-medium school in each of Palestine/Israel and Morocco. Use of and exposure to English outside home and school is probably fairly similar in both locations, but while use of and exposure to French outside home and school is significant in Morocco, it is minimal in Palestine/Israel. A study of this nature would help shed light on whether the role of each language as a societal language in each location impacts nativelikeness in school bilinguals.

There are many schools around the world in which the medium of instruction is the students' L2, but some of these schools may not be suited for a study on nativelikeness if they are not *full-immersion* schools as operationalized in this dissertation, i.e., if they do not enough elements other than the medium of instruction that are likely to favor nativelikeness. Because there are many such elements that can affect a school's suitability and it can be hard to glean this information without specifically asking for it, I have developed an 18-question questionnaire, provided below, to help in screening potential schools to make sure they are suited for a study on nativelikeness. It assumes that the medium of instruction is English. The questionnaire or another version of it could be administered to a school representative who can provide the requested information.

**Important:** This questionnaire is for schools in which classes are taught exclusively or almost exclusively in English **for all grade levels (kindergarten through 12<sup>th</sup> grade)**. Please do not complete this questionnaire if the use of English for instruction at your school is limited to certain grade levels (for example, high school only).

1. In what language(s) are the classes taught at your school? If they are taught in more than one language, please indicate which classes are taught in which language.
2. What language(s) do the students typically use *outside of class* while in school? If they use more than one language, please approximate the percentage of use for each language.
3. Does your school have any rules regarding what language(s) can be used (whether in class or outside of class)? If so, please elaborate.
4. What is/are the native language(s) of the faculty? If they have more than one native language, please approximate the percentage of speakers for each language.
5. What language(s), other than their native language(s), can the teachers speak?
6. What language(s) do the teachers use to speak to the students? If they use more than one language, please approximate the percentage of use for each language.
7. What is/are the native language(s) of the non-teaching staff? If they have more than one native language, please approximate the percentage of speakers for each language.
8. What type of curriculum does your school use? If your school uses different curricula for different classes, please indicate which classes use which curriculum.
9. What publisher(s) does your school use for textbooks? If you use more than one publisher, please indicate which textbook(s) come from which publisher.
10. Where do you acquire non-textbook classroom materials?
11. Do you use any textbooks or classroom materials intended for ESL (English as a Second Language) students?
12. Does your school teach the widespread language(s) used in the community your school is located in? If so, what language(s) are used for instruction and what is/are the native language(s) of the teachers?



13. Does your school teach any foreign languages, other than English and the widespread language(s) used in the community your school is located in? If so, what languages are taught? What language(s) are they taught in, and what is/are the native language(s) of the teachers?
14. What is/are the native language(s) of the students at your school? If they have more than one native language, please approximate the percentage of native speakers for each language.
15. Do any of your students come from bilingual families, where each parent speaks a different language? If so, please approximate the number of students with that type of background.
16. Have any of your students spent a significant amount of time living in a different country? If so, please approximate the number of students that have lived in each country.
17. In your judgment, what percentage of the students at your school sound like native speakers of English?
18. What types of extracurricular activities are offered at your school? What language(s) is used during meetings, events, etc. related to those activities? If more than one language is used, please indicate what language(s) are used for which activity.

## 5.9 CONCLUSION

Questions about ultimate attainment and nativelike competence will continue to occupy the attention of SLA researchers for a long time to come. There are a host of factors that impact ultimate attainment and nativelikeness, and while some factors have been demonstrated through extensive research to have certain effects, others have not been, and furthermore, some of the interactions between different factors have not been sufficiently researched. Bilingualism is a

multi-faceted phenomenon, and much research remains to be done in order to better understand the profiles of certain understudied types of bilinguals, and how the various factors constituting those profiles interact and what linguistic outcomes they produce.

This dissertation has brought us one step closer to a better understanding of one such type of bilinguals—school bilinguals—who become bilingual through full-immersion schooling in an L2. While many questions remain unanswered, and a great deal of further research is still necessary, this dissertation indicates that full-immersion schooling can, at least in some cases, lead to nativelikeness in both the L1 and the L2. It remains to be seen whether full-immersion schooling consistently leads to these outcomes, and, in case it does not, what factors are responsible for the inconsistency.

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## APPENDIX A: LINGUISTIC QUESTIONNAIRE

*The demographic questions were asked of all participants. The questions about language use and exposure and socioaffective factors were asked of the school bilinguals and the heritage speakers only.*

### INSTRUCTIONS

Please complete the following questionnaire.

الرجاء ملء الاستفتاء التالي.

### DEMOGRAPHIC QUESTIONS

Participant Number / رقم المشترك

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Age / العمر

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Gender / الجنس

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Place of birth (city and country)

مكان الولادة (المدينة والبلد)

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Occupation (Please enter "student," "housewife," "unemployed," "retired," etc. if applicable)

(المهنة) ممكن كتابة "طالب"، "ربة بيت"، "عاطل عن العمل"، "متقاعد" إلخ حسب ما ينطبق عليك

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أعلى درجة تعليم أحرزتها / Highest level of education

- ☐ أقل من الثانوية / less than high school
- ☐ الثانوية / high school
- ☐ أعلى من الثانوية ولكن أقل من درجة البكالوريوس / more than high school but less than Bachelor's degree
- ☐ بكالوريوس / Bachelor's degree
- ☐ أعلى من البكالوريوس ولكن أقل من الماجستير / more than Bachelor's but less than Master's
- ☐ الماجستير / Master's
- ☐ أعلى من الماجستير ولكن أقل من الدكتوراه / more than Master's but less than doctorate
- ☐ الدكتوراه / doctorate

Please enter the language(s) you know, and rank your proficiency in them on a scale of 1 to 11, as follows:

الرجاء تحديد اللغة/اللغات التي تعرفها، وتقييم إتقانك لها بتحديد درجة بين الصفر والعشرة، كما يلي:

1	مبتدئ، مستوى منخفض / beginner low
2	مبتدئ، مستوى متوسط / beginner mid
3	مبتدئ، مستوى عالٍ / beginner high
4	متوسط، مستوى منخفض / intermediate low
5	متوسط، مستوى متوسط / intermediate mid
6	متوسط، مستوى عالٍ / intermediate high
7	متقدم، مستوى منخفض / advanced low
8	متقدم، مستوى متوسط / advanced mid
9	متقدم، مستوى عالٍ / advanced high
10	ما يقارب اللغة الأم / near-native
11	مستوى اللغة الأم / native command

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What is the language you know best? / ما هي اللغة التي تتقنها أكثر من أي لغة أخرى؟

\_\_\_\_\_

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## LANGUAGE USE AND EXPOSURE

The next series of questions is about your language use and exposure (speaking, listening, reading, and writing) during different periods of your life. For each question, please indicate a percentage for each choice. **The individual percentages for each question must total 100%.**

**Hearing** includes people speaking to you as well as TV, movies, radio, etc.

في سلسلة الأسئلة القادمة نطلب منك أن تعطينا معلومات عن اللغات التي استخدمتها واحتككت بها خلال فترات مختلفة من حياتك. الرجاء تحديد نسبة لكل من الخيارات في كل سؤال. **على مجموع النسب في كل سؤال أن يساوي ١٠٠٪.**

يشمل **السمع** ما سمعته ممن كلمك وأيضًا التلفاز والأفلام والراديو وإلى آخره .

## FROM BIRTH UNTIL THE START OF SCHOOLING

منذ الولادة وحتى بداية التعليم المدرسي

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How much of your language use and exposure took place

ماذا كانت نسبة استخدامك للغات واحتكاكك بها:

at home / في البيت \_\_\_\_\_

outside home / خارج البيت \_\_\_\_\_

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What language(s) did you **hear at home**?

ماذا كانت اللغات التي سمعتها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

-----

What language(s) did you **speak at home**?

ماذا كانت اللغات التي تكلمتها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

-----

What language(s) did you **hear outside your home**?

ماذا كانت اللغات التي سمعتها خارج البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

-----

What language(s) did you **speak outside your home**?

ماذا كانت اللغات التي تكلمتها خارج البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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## **DURING KINDERGARTEN AND ELEMENTARY SCHOOL**

خلال الروضة والمدرسة الابتدائية

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How much of your language use and exposure took place

ماذا كانت نسبة استخدامك للغات واحتكاكك بها:

at home / في البيت \_\_\_\_\_

at school / في المدرسة \_\_\_\_\_

outside home and school / خارج البيت والمدرسة \_\_\_\_\_

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What language(s) did you **hear at home**?

ماذا كانت اللغات التي سمعتها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **speak at home**?

ماذا كانت اللغات التي تكلمتها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

---

What language(s) did you **read in at home**?

ماذا كانت اللغات التي قرأت بها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **write in at home**?

ماذا كانت اللغات التي كتبت بها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

---

What language(s) did you **hear in class at school**?

ماذا كانت اللغات التي سمعتها في الصف في المدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **speak in class at school**?

ماذا كانت اللغات التي **تكلمتها في الصف في المدرسة**؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **hear outside class at school**?

ماذا كانت اللغات التي سمعتها **خارج الصف في المدرسة**؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **speak outside class at school**?

ماذا كانت اللغات التي **تكلمتها خارج الصف في المدرسة**؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

---

What language(s) did you **read in at school**?

ماذا كانت اللغات التي **قرأت بها في المدرسة**؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

---

What language(s) did you **write in at school**?

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **hear outside home and school**?

ماذا كانت اللغات التي سمعتها خارج البيت والمدرسة؟

American English / الإنكليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **speak outside home and school**?

ماذا كانت اللغات التي تكلمتها خارج البيت والمدرسة؟

American English / الإنكليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **read in outside home and school**?

ماذا كانت اللغات التي قرأت بها خارج البيت والمدرسة؟

American English / الإنكليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

-----

What language(s) did you **write in outside home and school**?

ماذا كانت اللغات التي كتبت بها خارج البيت والمدرسة؟

American English / الإنكليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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## **DURING MIDDLE SCHOOL / JUNIOR HIGH SCHOOL AND HIGH SCHOOL**

خلال المدرسة الإعدادية والثانوية

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How much of your language use and exposure took place

ماذا كانت نسبة استخدامك للغات واحتكاكك بها:

at home / في البيت \_\_\_\_\_

at school / في المدرسة \_\_\_\_\_

outside home and school / خارج البيت والمدرسة \_\_\_\_\_

What language(s) did you **hear at home**?

ماذا كانت اللغات التي سمعتها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

What language(s) did you **speak at home**?

ماذا كانت اللغات التي تكلمتها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

What language(s) did you **read in at home**?

ماذا كانت اللغات التي قرأت بها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

What language(s) did you **write in at home**?

ماذا كانت اللغات التي كتبت بها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

What language(s) did you **hear in class at school**?

ماذا كانت اللغات التي سمعتها في الصف في المدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **speak in class at school**?

ماذا كانت اللغات التي تكلمتها في الصف في المدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **hear outside class at school**?

ماذا كانت اللغات التي سمعتها خارج الصف في المدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **speak outside class at school**?

ماذا كانت اللغات التي تكلمتها خارج الصف في المدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **read in at school**?

ماذا كانت اللغات التي قرأت بها في المدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **write in at school**?

ماذا كانت اللغات التي كتبت بها في المدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **hear outside home and school**?

ماذا كانت اللغات التي سمعتها خارج البيت والمدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **speak outside home and school**?

ماذا كانت اللغات التي تكلمتها خارج البيت والمدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **read in outside home and school**?

ماذا كانت اللغات التي قرأت بها خارج البيت والمدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) did you **write in outside home and school**?

ماذا كانت اللغات التي كتبت بها خارج البيت والمدرسة؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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## SINCE GRADUATING FROM HIGH SCHOOL

منذ التخرج من المدرسة الثانوية

How much of your language use and exposure took place

ماذا كانت نسبة استخدامك للغات واحتكاكك بها:

at home / في البيت \_\_\_\_\_

outside home / خارج البيت \_\_\_\_\_

What language(s) have you **heard at home**?

ماذا كانت اللغات التي سمعتها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

What language(s) have you **spoken at home**?

ماذا كانت اللغات التي تكلمتها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

What language(s) have you **read in at home**?

ماذا كانت اللغات التي قرأت بها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

What language(s) have you **written in at home**?

ماذا كانت اللغات التي كتبت بها في البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) have you **heard outside your home**?

ماذا كانت اللغات التي سمعتها خارج البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) have you **spoken outside your home**?

ماذا كانت اللغات التي تكلمتها خارج البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Palestinian Arabic / العربية العامية الفلسطينية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) have you **read in outside your home**?

ماذا كانت اللغات التي قرأت بها خارج البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

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What language(s) have your **written in outside your home**?

ماذا كانت اللغات التي كتبت بها خارج البيت؟

American English / الإنجليزية الأمريكية \_\_\_\_\_

Arabic / العربية \_\_\_\_\_

Other language(s) / اللغات الأخرى \_\_\_\_\_

SOCIOAFFECTIVE FACTORS



## Instructions

For each of the following statements, please indicate the extent to which it applies to you by selecting a number between 0 and 10.

"In school" refers to all of your schooling, from kindergarten to high school.

الرجاء قراءة كل من الجمل التالية وتحديد إلى أي حد تنطبق عليك وذلك باختيار رقم بين الصفر والعشرة.

يشير تعبير "في المدرسة" إلى كل السنوات التي كنت فيها طالب مدرسة، أي من الروضة وحتى المدرسة الثانوية.

## English/US, During School, Social Factors

When I was in school, I had strong emotional ties to the English language.

عندما كنت في المدرسة، كانت تربطني باللغة الإنجليزية روابط عاطفية وطيدة.

When I was in school, I identified with the English language.

عندما كنت في المدرسة، كنت أشعر بِصِلَة باللغة الإنجليزية.

When I was in school, I identified with the United States.

عندما كنت في المدرسة، كنت أشعر بِصِلَة بالولايات المتحدة.

When I was in school, I identified with Americans.

عندما كنت في المدرسة، كنت أشعر بِصِلَة بالأمريكيين.

When I was in school, I identified with American values.

عندما كنت في المدرسة، كنت أشعر بِصِلَة بالقيم الأمريكية.

When I was in school, I thought highly of American society.

عندما كنت في المدرسة، كنت أَقْدِر المجتمع الأمريكي.

When I was in school, being a speaker of English was an important part of my social identity.

عندما كنت في المدرسة، كان كوني ناطقًا باللغة الإنجليزية جزءًا هامًا من مفهومي الذاتي في المجتمع.

When I was in school, I was proud to be an English speaker.

عندما كنت في المدرسة، كنت أَفتخر بكوني ناطقًا باللغة الإنجليزية.

When I was in school, I wanted people to identify me as an English speaker.

عندما كنت في المدرسة، كنت أُرغب في أن يُعرّفني الآخرون كناطق باللغة الإنجليزية.

When I was in school, I wanted people to associate me with American culture.

عندما كنت في المدرسة، كنت أُرغب في أن يرى الآخرون صِلَة بيني وبين الثقافة الأمريكية.

## English/US, During School, Personal Factors

When I was in school, I felt American.

عندما كنت في المدرسة، كنت أشعر بأنني أمريكي.

When I was in school, my personal values were American.

عندما كنت في المدرسة، كانت قيمي الشخصية أمريكية.

When I was in school, I felt like I fit in with Americans.

عندما كنت في المدرسة، كنت أشعر بأنه من السهل لي أن أنسجم مع الأمريكيين.

When I was in school, I felt like the English language was an important part of me.

عندما كنت في المدرسة، كنت أشعر بأن اللغة الإنجليزية جزء هام مني.

When I was in school, people often perceive me as American.

عندما كنت في المدرسة، كان الآخرون في الكثير من الأحيان ينظرون إلي على أنني أمريكي.

When I was in school, I liked it when people heard me speaking English.

عندما كنت في المدرسة، كنت أحب أن يسمعي الآخرون وأنا أتكلّم الإنجليزية.

When I was in school, I liked it when people perceived me as American.

عندما كنت في المدرسة، كنت أحب أن ينظر الآخرون إلي على أنني أمريكي.

When I was in school, I would think like an American.

عندما كنت في المدرسة، كانت طريقة تفكيري كطريقة تفكير الأمريكي.

When I was in school, I felt like I was being myself when I was speaking English.

عندما كنت في المدرسة، كنت أشعر بأنني على طبيعتي وأنا أتكلّم الإنجليزية.

When I was in school, I felt connected to the English language.

عندما كنت في المدرسة، كنت أشعر بما يربطني باللغة الإنجليزية.

#### English/US, During School, Attitudinal Factors

When I was in school, I loved English.

عندما كنت في المدرسة، كنت أعشق اللغة الإنجليزية.

When I was in school, I felt that Americans were a sociable and warm-hearted people.

عندما كنت في المدرسة، كنت أشعر بأن الشعب الأمريكي اجتماعي ودافئ القلب.

When I was in school, I liked meeting Americans.

عندما كنت في المدرسة، كنت أحب التعرّف على الأمريكيين.

When I was in school, I had a favorable attitude towards Americans.

عندما كنت في المدرسة، كان لدي موقف إيجابي تجاه الأمريكيين.

When I was in school, I felt that Americans were friendly and hospitable.

عندما كنت في المدرسة، كنت أشعر بأن الأمريكيين ودودون ويحسنون الضيافة.

When I was in school, I felt that Americans were cheerful, agreeable and good-humored.

عندما كنت في المدرسة، كنت أشعر بأن الأمريكيين مرحون وسلسون وبشوشون.

When I was in school, I felt that Americans were a kind and generous people.

عندما كنت في المدرسة، كنت أشعر بأن الشعب الأمريكي لطيف وكريم.

When I was in school, I felt that the United States had a rich history and heritage.

عندما كنت في المدرسة، كنت أشعر بأن الولايات المتحدة لها تاريخ وتراث ثريان.

When I was in school, I admired American values.

عندما كنت في المدرسة، كنت أقدر القيم الأمريكية.

When I was in school, I felt that American culture was admirable.

عندما كنت في المدرسة، كنت أشعر بأن الثقافة الأمريكية جديرة بالتقدير.

#### Arabic/Arab World, During School, Social Factors

When I was in school, I had strong emotional ties to the Arabic language.

عندما كنت في المدرسة، كانت تربطني باللغة العربية روابط عاطفية وطيدة.

When I was in school, I identified with the Arabic language.

عندما كنت في المدرسة، كنت أشعر بصلة باللغة العربية.

When I was in school, I identified with the Arab World.

عندما كنت في المدرسة، كنت أشعر بصلة بالعالم العربي.

When I was in school, I identified with Arabs.

عندما كنت في المدرسة، كنت أشعر بصلة بالعرب.

When I was in school, I identified with Arab values.

عندما كنت في المدرسة، كنت أشعر بصلة بالقيم العربية.

When I was in school, I thought highly of Arab society.

عندما كنت في المدرسة، كنت أقدر المجتمع العربي.

When I was in school, being a speaker of Arabic was an important part of my social identity.

عندما كنت في المدرسة، كان كوني ناطقاً باللغة العربية جزءاً هاماً من مفهومي الذاتي في المجتمع.

When I was in school, I was proud to be an Arabic speaker.

عندما كنت في المدرسة، كنت أفخر بكوني ناطقاً باللغة العربية.

When I was in school, I wanted people to identify me as an Arabic speaker.  
عندما كنت في المدرسة، كنت أرغب في أن يُعرّفني الآخرون كناطق باللغة العربية.

When I was in school, I wanted people to associate me with Arab culture.  
عندما كنت في المدرسة، كنت أرغب في أن يرى الآخرون صلة بيني وبين الثقافة العربية.

#### Arabic/Arab World, During School, Personal Factors

When I was in school, I felt Arab.  
عندما كنت في المدرسة، كنت أشعر بأنني عربي.

When I was in school, my personal values were Arab.  
عندما كنت في المدرسة، كانت قيمي الشخصية عربية.

When I was in school, I felt like I fit in with Arabs.  
عندما كنت في المدرسة، كنت أشعر بأنه من السهل لي أن أنسجم مع العرب.

When I was in school, I felt like the English language was an important part of me.  
عندما كنت في المدرسة، كنت أشعر بأن اللغة العربية جزء هام منّي.

When I was in school, people often perceived me as Arab.  
عندما كنت في المدرسة، كان الآخرون في الكثير من الأحيان ينظرون إلي على أنني عربي.

When I was in school, I liked it when people heard me speaking Arabic.  
عندما كنت في المدرسة، كنت أحب أن يسمعي الآخرون وأنا أتكلّم العربية.

When I was in school, I liked it when people perceived me as Arab.  
عندما كنت في المدرسة، كنت أحب أن ينظر الآخرون إلي على أنني عربي.

When I was in school, I would think like an Arab.  
عندما كنت في المدرسة، كانت طريقة تفكيري كطريقة تفكير العربي.

When I was in school, I felt like I was being myself when I was speaking Arabic.  
عندما كنت في المدرسة، كنت أشعر بأنني على طبيعتي وأنا أتكلّم العربية.

When I was in school, I felt connected to the Arabic language.  
عندما كنت في المدرسة، كنت أشعر بما يربطني باللغة العربية.

#### Arabic/Arab World, During School, Attitudinal Factors

When I was in school, I loved Arabic.  
عندما كنت في المدرسة، كنت أعشق اللغة العربية.

When I was in school, I felt that Arabs were a sociable and warm-hearted people.

عندما كنت في المدرسة، كنت أشعر بأن الشعب العربي اجتماعي ودافئ القلب.

When I was in school, I liked meeting Arabs.

عندما كنت في المدرسة، كنت أحب التعرف على العرب.

When I was in school, I had a favorable attitude towards Arabs.

عندما كنت في المدرسة، كان لدي موقف إيجابي تجاه العرب.

When I was in school, I felt that Arabs were friendly and hospitable.

عندما كنت في المدرسة، كنت أشعر بأن العرب ودودون ويحسنون الضيافة.

When I was in school, I felt that Arabs were cheerful, agreeable, and good-humored.

عندما كنت في المدرسة، كنت أشعر بأن العرب مرحون وسلسون وبشوشون.

When I was in school, I felt that Arabs were a kind and generous people.

عندما كنت في المدرسة، كنت أشعر بأن الشعب العربي لطيف وكريم.

When I was in school, I felt that the Arab World had a rich history and heritage.

عندما كنت في المدرسة، كنت أشعر بأن العالم العربي له تاريخ وتراث ثريان.

When I was in school, I admired Arab values.

عندما كنت في المدرسة، كنت أقدر القيم العربية.

When I was in school, I felt that Arab culture was admirable.

عندما كنت في المدرسة، كنت أشعر بأن الثقافة العربية جديرة بالتقدير.

#### English/US, Since Graduation, Social Factors

Since graduating from high school, I have had strong emotional ties to the English language.

منذ أن تخرّجت من المدرسة الثانوية وتربطني باللغة الإنجليزية روابط عاطفية وطيدة.

Since graduating from high school, I have identified with the English language.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بصلة باللغة الإنجليزية.

Since graduating from high school, I have identified with the United States.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بصلة بالولايات المتحدة.

Since graduating from high school, I have identified with Americans.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بصلة بالأمريكيين.

Since graduating from high school, I have identified with American values.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بصلة بالقيم الأمريكية.

Since graduating from high school, I have thought highly of American society.

منذ أن تخرّجت من المدرسة الثانوية وأقّدر المجتمع الأمريكي.

Since graduating from high school, being a speaker of English has been an important part of my social identity.

منذ أن تخرّجت من المدرسة الثانوية وكوني ناطقًا باللغة الإنجليزية جزء هام من مفهومي الذاتي في المجتمع.

Since graduating from high school, I have been proud to be an English speaker.

منذ أن تخرّجت من المدرسة الثانوية وأفتخر بكوني ناطقًا باللغة الإنجليزية.

Since graduating from high school, I have wanted people to identify me as an English speaker.

منذ أن تخرّجت من المدرسة الثانوية وأرغب في أن يُعرّفني الآخرون كناطق باللغة الإنجليزية.

Since graduating from high school, I have wanted people to associate me with American culture.

منذ أن تخرّجت من المدرسة الثانوية وأرغب في أن يرى الآخرون صلة بيني وبين الثقافة الأمريكية.

#### English/US, Since Graduation, Personal Factors

Since graduating from high school, I have felt American.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأني أمريكي.

Since graduating from high school, my personal values have been American.

منذ أن تخرّجت من المدرسة الثانوية وقيمي الشخصية أمريكية.

Since graduating from high school, I have felt like I fit in with Americans.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأنه من السهل لي أن أنسجم مع الأمريكيين.

Since graduating from high school, I have felt like the English language is an important part of me.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن اللغة الإنجليزية جزء هام منّي.

Since graduating from high school, people have often perceived me as American.

منذ أن تخرّجت من المدرسة الثانوية والآخرون في الكثير من الأحيان ينظرون إلي على أنني أمريكي.

Since graduating from high school, I have liked it when people have heard me speaking English.

منذ أن تخرّجت من المدرسة الثانوية وأحب أن يسمعي الآخرون وأنا أتكلّم الإنجليزية.

Since graduating from high school, I have liked it when people have perceived me as American.

منذ أن تخرّجت من المدرسة الثانوية وأحب أن ينظر الآخرون إلي على أنني أمريكي.

Since graduating from high school, I have been thinking like an American.

منذ أن تخرّجت من المدرسة الثانوية وطريقة تفكيري كطريقة تفكير الأمريكي.

Since graduating from high school, I have felt like I have been myself when speaking English.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأنني على طبيعتي وأنا أتكلّم الإنجليزية.

Since graduating from high school, I have felt connected to the English language.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بما يربطني باللغة الإنجليزية.

English/US, Since Graduation, Attitudinal Factors

Since graduating from high school, I have loved English.  
منذ أن تخرّجت من المدرسة الثانوية وأعشق اللغة الإنجليزية.

Since graduating from high school, I have felt that Americans are a sociable and warm-hearted people.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الشعب الأمريكي اجتماعي ودافئ القلب.

Since graduating from high school, I have liked meeting Americans.  
منذ أن تخرّجت من المدرسة الثانوية وأحب التعرّف على الأمريكيين.

Since graduating from high school, I have had a favorable attitude towards Americans.  
منذ أن تخرّجت من المدرسة الثانوية ولدي موقف إيجابي تجاه الأمريكيين.

Since graduating from high school, I have felt that Americans are friendly and hospitable.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الأمريكيين ودودون ويحسنون الضيافة.

Since graduating from high school, I have felt that Americans are cheerful, agreeable, and good-humored.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الأمريكيين مرحون وسلسون وبشوشون.

Since graduating from high school, I have felt that Americans are a kind and generous people.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الشعب الأمريكي لطيف وكرم.

Since graduating from high school, I have felt that the United States has a rich history and heritage.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الولايات المتحدة لها تاريخ وتراث ثريان.

Since graduating from high school, I have admired American values.  
منذ أن تخرّجت من المدرسة الثانوية وأقدّر القيم الأمريكية.

Since graduating from high school, I have felt that American culture is admirable.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الثقافة الأمريكية جديرة بالتقدير.

Arabic/Arab World, Since Graduation, Social Factors

Since graduating from high school, I have had strong emotional ties to the Arabic language.  
منذ أن تخرّجت من المدرسة الثانوية وتربطني باللغة العربية روابط عاطفية وطيدة.

Since graduating from high school, I have identified with the Arabic language.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بِصِلَة باللغة العربية.

Since graduating from high school, I have identified with the Arab World.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بِصِلَة بالعالم العربي.

Since graduating from high school, I have identified with Arabs.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بِصِلَة بالعرب.

Since graduating from high school, I have identified with Arab values.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بِصِلَة بالقيم العربية.

Since graduating from high school, I have thought highly of Arab society.  
منذ أن تخرّجت من المدرسة الثانوية وأقدّر المجتمع العربي.

Since graduating from high school, being a speaker of Arabic has been an important part of my social identity.  
منذ أن تخرّجت من المدرسة الثانوية وكوني ناطقًا باللغة العربية جزء هام من مفهومي الذاتي في المجتمع.

Since graduating from high school, I have been proud to be an Arabic speaker.  
منذ أن تخرّجت من المدرسة الثانوية وأفتخر بكوني ناطقًا باللغة العربية.

Since graduating from high school, I have wanted people to identify me as an Arabic speaker.  
منذ أن تخرّجت من المدرسة الثانوية وأرغب في أن يُعرّفني الآخرون كناطق باللغة العربية.

Since graduating from high school, I have wanted people to associate me with Arab culture.  
منذ أن تخرّجت من المدرسة الثانوية وأرغب في أن يرى الآخرون صِلَة بيني وبين الثقافة العربية.

#### Arabic/Arab World, Since Graduation, Personal Factors

Since graduating from high school, I have felt Arab.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأني عربي.

Since graduating from high school, my personal values have been Arab.  
منذ أن تخرّجت من المدرسة الثانوية وقيمي الشخصية عربية.

Since graduating from high school, I have felt like I fit in with Arabs.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأنه من السهل لي أن أنسجم مع العرب.



Since graduating from high school, I have felt like the English language is an important part of me.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن اللغة العربية جزء هام منّي.

Since graduating from high school, people have often perceived me as Arab.

منذ أن تخرّجت من المدرسة الثانوية والآخرين في الكثير من الأحيان ينظرون إلي على أنني عربي.

Since graduating from high school, I have liked it when people have heard me speaking Arabic.

منذ أن تخرّجت من المدرسة الثانوية وأحب أن يسمعنني الآخرون وأنا أتكلّم العربية.

Since graduating from high school, I have liked it when people have perceived me as Arab.

منذ أن تخرّجت من المدرسة الثانوية وأحب أن ينظر الآخرون إلي على أنني عربي.

Since graduating from high school, I have been thinking like an Arab.

منذ أن تخرّجت من المدرسة الثانوية وطريقة تفكيري كطريقة تفكير العربي.

Since graduating from high school, I have felt like I have been myself when speaking Arabic.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأنني على طبيعتي وأنا أتكلّم العربية.

Since graduating from high school, I have felt connected to the Arabic language.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بما يربطني باللغة العربية.

#### Arabic/Arab World, Since Graduation, Attitudinal Factors

Since graduating from high school, I have loved Arabic.

منذ أن تخرّجت من المدرسة الثانوية وأعشق اللغة العربية.

Since graduating from high school, I have felt that Arabs are a sociable and warm-hearted people.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الشعب العربي اجتماعي ودافئ القلب.

Since graduating from high school, I have liked meeting Arabs.

منذ أن تخرّجت من المدرسة الثانوية وأحب التعرّف على العرب.

Since graduating from high school, I have had a favorable attitude towards Arabs.

منذ أن تخرّجت من المدرسة الثانوية ولدي موقف إيجابي تجاه العرب.

Since graduating from high school, I have felt that Arabs are friendly and hospitable.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن العرب ودودون ويحسنون الضيافة.

Since graduating from high school, I have felt that Arabs are cheerful, agreeable and good-humored.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن العرب مرحون وسلسون وبشوشون.

Since graduating from high school, I have felt that Arabs are a kind and generous people.  
منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الشعب العربي لطيف وكرم.

Since graduating from high school, I have felt that the Arab World has a rich history and heritage.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن العالم العربي له تاريخ وتراث ثريان.

Since graduating from high school, I have admired Arab values.

منذ أن تخرّجت من المدرسة الثانوية وأُقدّر القيم العربية.

Since graduating from high school, I have felt that Arab culture is admirable.

منذ أن تخرّجت من المدرسة الثانوية وأشعر بأن الثقافة العربية جديرة بالتقدير.

## APPENDIX B: LANGUAGE APTITUDE TEST

### GENERAL INSTRUCTIONS

This section consists of three language tests. Each test consists of a learning portion and a testing portion. In each learning portion, you will learn a feature of an artificial language, and in each testing portion, you will be tested on what you have learned. Each learning portion is timed, so make sure that you are fully ready before starting. Read the instructions carefully and make sure you understand what you need to do. **Every question requires a response before you can continue.**

يتضمن هذا القسم ثلاثة اختبارات لغوية، وكل اختبار يتضمن قسم تعلّم وقسم فحص. في قسم التعلّم ستتعلم إحدى خاصيات لغة مصطنعة، وفي قسم الفحص ستمتحن في ما تعلمته. لكل قسم تعلّم هناك توقيت مُحدّد، ولذلك فعليك التأكد من أنك جاهز كلياً قبل أن تبدأ. اقرأ التعليمات بتمعّن وتأكد من أنك قد فهمت ما عليك أن تفعله. **عليك أن تجيب عن كل سؤال قبل المتابعة.**

### LLAMA\_B

*In the testing portion, participants were presented with the same answer choices, in the same order, for each question. Below, the answer choices are shown for the first question only. For target responses, consult the image presented in the learning portion.*

#### Language Test 1: Vocabulary Learning

الاختبار اللغوي الأول: تعلّم المفردات

This is a test of your ability to learn words in a foreign language.

Once you click NEXT to go to the next page, the learning portion will begin. You will see a number of unusual objects, each one with its name underneath. You will have **two minutes** to study the objects and learn their names, and then you will be tested on how many objects you can match with their names.

Click the NEXT button when you are ready to start. The two-minute timer will begin immediately after you proceed to the next page.

هذا الاختبار يمتحن قدرتك على تعلّم الكلمات في لغة أجنبية.

عندما تضغط على NEXT لتنتقل إلى الصفحة القادمة، سيبدأ قسم التعلّم. ستري مجموعة من الصور الغريبة، وتحت كل صورة ستري اسمها. سيكون معك دقيقتان لدراسة الصور وتعلّم أسمائها، وبعد ذلك ستمتحن في عدد الصور التي تستطيع مطابقتها مع أسمائها.

اضغط على NEXT عندما تكون مستعداً أن تبدأ. سيبدأ عدّاد الدقيقتين فور انتقالك إلى الصفحة التالية.



Now you will be tested on what you just learned. Once you click NEXT to go to the next page, the testing portion will begin. On each page, you will be given the name of one of the objects and asked to identify the object that goes with that name. If you do not know the answer, guess. You must answer each question to move to the next one. Click NEXT to proceed from one page to the next.

الآن سَتُمتَحَن في ما تعلَّمْتَه. عندما تضغط على NEXT لتنتقل إلى الصفحة القادمة، سيبدأ قسم الفحص. في كل صفحة، ستري اسم إحدى الصور وسيُطلب منك تحديد الصورة التي تطابق الاسم. إذا لم تعرف الإجابة عن سؤال ما، خَمَّن. عليك الإجابة عن كل سؤال قبل الانتقال إلى السؤال الذي يليه. اضغط NEXT للانتقال من صفحة إلى أخرى.

Find the SO.O and click on it.

Guess if you do not know the answer.

أجد SO.O واضغط عليها.

إذا لم تعرف الإجابة، خَمَّن.



Find the YUKA and click on it.  
 Guess if you do not know the answer.  
 أجد YUKA واضغط عليها.  
 إذا لم تعرف الإجابة، خمن.

Find the INA and click on it.  
 Guess if you do not know the answer.  
 أجد INA واضغط عليها.  
 إذا لم تعرف الإجابة، خمن.

Find the KO.O and click on it.  
 Guess if you do not know the answer.  
 أجد KO.O واضغط عليها.  
 إذا لم تعرف الإجابة، خمن.

Find the SUKU and click on it.  
 Guess if you do not know the answer.  
 أجد SUKU واضغط عليها.  
 إذا لم تعرف الإجابة، خمن.

Find the TACHI and click on it.  
 Guess if you do not know the answer.  
 أجد TACHI واضغط عليها.  
 إذا لم تعرف الإجابة، خمن.

Find the CHAKA and click on it.

Guess if you do not know the answer.  
أجد CHAKA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the CHUKU and click on it.  
Guess if you do not know the answer.  
أجد CHUKU واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the TAA and click on it.  
Guess if you do not know the answer.  
أجد TAA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the SUMA and click on it.  
Guess if you do not know the answer.  
أجد SUMA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the YUA and click on it.  
Guess if you do not know the answer.  
أجد YUA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the XIKA and click on it.  
Guess if you do not know the answer.  
أجد XIKA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the YUTUN and click on it.  
Guess if you do not know the answer.  
أجد YUTUN واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the SAA and click on it.  
Guess if you do not know the answer.  
أجد SAA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the IXA and click on it.  
Guess if you do not know the answer.  
أجد IXA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the ITA and click on it.  
Guess if you do not know the answer.

أجد ITA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the LULU and click on it.  
Guess if you do not know the answer.  
أجد LULU واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the IVA and click on it.  
Guess if you do not know the answer.  
أجد IVA واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the YO.O and click on it.  
Guess if you do not know the answer.  
أجد YO.O واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

Find the TUU and click on it.  
Guess if you do not know the answer.  
أجد TUU واضغط عليها.  
إذا لم تعرف الإجابة، خمن.

LLAMA\_E

*Below are the sounds that were played when participants clicked on the symbols in the learning portion.*

0ö	pi
0ë	pa
0ä	pu
3ö	tsi
3ë	ta
3ä	tu
9ö	ki
9ë	ka
9ä	ku
0o	bi
0e	ba
0a	bu
3o	di
3e	da

3a	du
9o	gi
9e	ga
9a	gu
0ô	mi
0ê	ma
0â	mu
3ô	ni
3ê	na
3â	nu

*In the testing portion, each question had the same prompt, and participants were presented with the same answer choices, in the same order, for each question. Below, the prompt and the answer choices are shown one time only.*

*Below are the sounds that were played in the testing portion, in the order in which they were played, with the target response for each sound.*

dinu	3o3â
panu	0ë3â
bubu	0a0a
kadu	9ë3a
maku	0ê9ä
tadu	3ë3a
binu	0o3â
mudi	0â3o
dupi	3a0ö
nudi	3â3o
dudi	3a3o
kama	9ë0ê
tsina	3ö3ê
kuta	9ä3ë
tata	3ë3ë
pima	0ö0ê
pata	0ë3ë
gita	9o3ë
bita	0o3ë
kupa	9ä0ë



## Language Test 2: Sounds and Symbols

الاختبار اللغوي الثاني: الأصوات والرموز

This is a test of your ability to link familiar sounds with unfamiliar symbols.

Once you click NEXT to go to the next page, the learning portion will begin. You will see a number of symbols, all on one page, each representing a different sound. You will have **two minutes** to study the symbols and learn what sound each symbol represents. Click on each symbol to hear the sound it represents. You can click any symbol as many times as you'd like within the two-minute time limit. After the two minutes have elapsed, you will be tested on your ability to match words containing these sounds with their written forms.

Click the NEXT button when you are ready to start. The two-minute timer will begin immediately after you proceed to the next page.

هذا الاختبار يمتحن قدرتك على ربط الأصوات المألوفة بالرموز غير المألوفة.

عندما تضغط على NEXT لتنتقل إلى الصفحة القادمة، سيبدأ قسم التعلم. ستري مجموعة من الرموز، كلها في صفحة واحدة، وكل واحد يمثل صوتاً مختلفاً. سيكون معك **دقيقتان** لدراسة الرموز وتعلم ما هو الصوت الذي يمثله كل رمز. اضغط على كل رمز لتسمع الصوت الذي يمثله. بإمكانك أن تضغط كل رمز أي عدد من المرات ضمن الدقيقتين المحددتين. بعد انتهاء الدقيقتين، ستمتحن في قدرتك على مطابقة كلمات تحتوي على هذه الأصوات مع أشكالها المكتوبة.

اضغط على NEXT عندما تكون مستعداً أن تبدأ. سيبدأ عدّاد الدقيقتين فور انتقالك إلى الصفحة التالية.

Oö	3ö	9ö	Oo	3o	9o	Oô	3ô
Oë	3ë	9ë	Oe	3e	9e	Oê	3ê
Oä	3ä	9ä	Oa	3a	9a	Oâ	3â

Now you will be tested on what you just learned. Once you click NEXT to go to the next page, the testing portion will begin.

You will click NEXT to proceed from one page to the next. Every time you get to a new page, a sound will be played **automatically**, and it will only be played **one time**. **You will not be able to hear it more than one time.** Make sure **your speakers are working properly** and **you are listening attentively** each time you click the NEXT button, so that you do not miss any of the sounds.

When you hear each sound, click on the word representing that sound. If you do not know the answer, select ????. You must answer each question to move to the next one.

الآن ستمتحن في ما تعلمته. عندما تضغط على NEXT لتنتقل إلى الصفحة القادمة، سيبدأ قسم الفحص.

ستضغط على NEXT للانتقال من صفحة إلى أخرى. في كل مرة تصل فيها إلى صفحة جديدة، سيُسَمَع صوت بشكل

تلقائي ومرة واحدة فقط. لن تتمكن من سماعه أكثر من مرة واحدة يتأكد من أن سماعاتك تعمل كما يجب وأنك تستمع بانتباه في كل مرة تضغط فيها NEXT لكيلا يفوتك أي من الأصوات.

عندما تسمع صوتاً، اضغط على الكلمة التي تمثل هذا الصوت. إذا لم تعرف الإجابة عن سؤال ما، اضغط على ????. عليك الإجابة عن كل سؤال قبل الانتقال إلى السؤال الذي يليه.

Choose the word representing the sound you just heard.

اختر الكلمة التي تمثل الصوت الذي سمعته.

<input type="radio"/> 3ë3ë	<input type="radio"/> 3ë3a	<input type="radio"/> 3ö3ê	<input type="radio"/> 3o3â	<input type="radio"/> 3â3o	<input type="radio"/> 3a3o	<input type="radio"/> 3a0ö
<input type="radio"/> 9ë0ë	<input type="radio"/> 9ë3a	<input type="radio"/> 9o3ë	<input type="radio"/> 9ä3ë	<input type="radio"/> 9ä0ë	<input type="radio"/> 0â3o	<input type="radio"/> 0ë9ä
<input type="radio"/> 0ë3ë	<input type="radio"/> 0ë3â	<input type="radio"/> 0ö0ê	<input type="radio"/> 0o3ë	<input type="radio"/> 0o3â	<input type="radio"/> 0a0a	<input type="radio"/> ????

LLAMA\_F

*Below, target responses are indicated in italics.*

### Language Test 3: Grammatical Inferences

الاختبار اللغوي الثالث: الاستنتاجات النحوية

This is a test of your ability to make grammatical inferences.

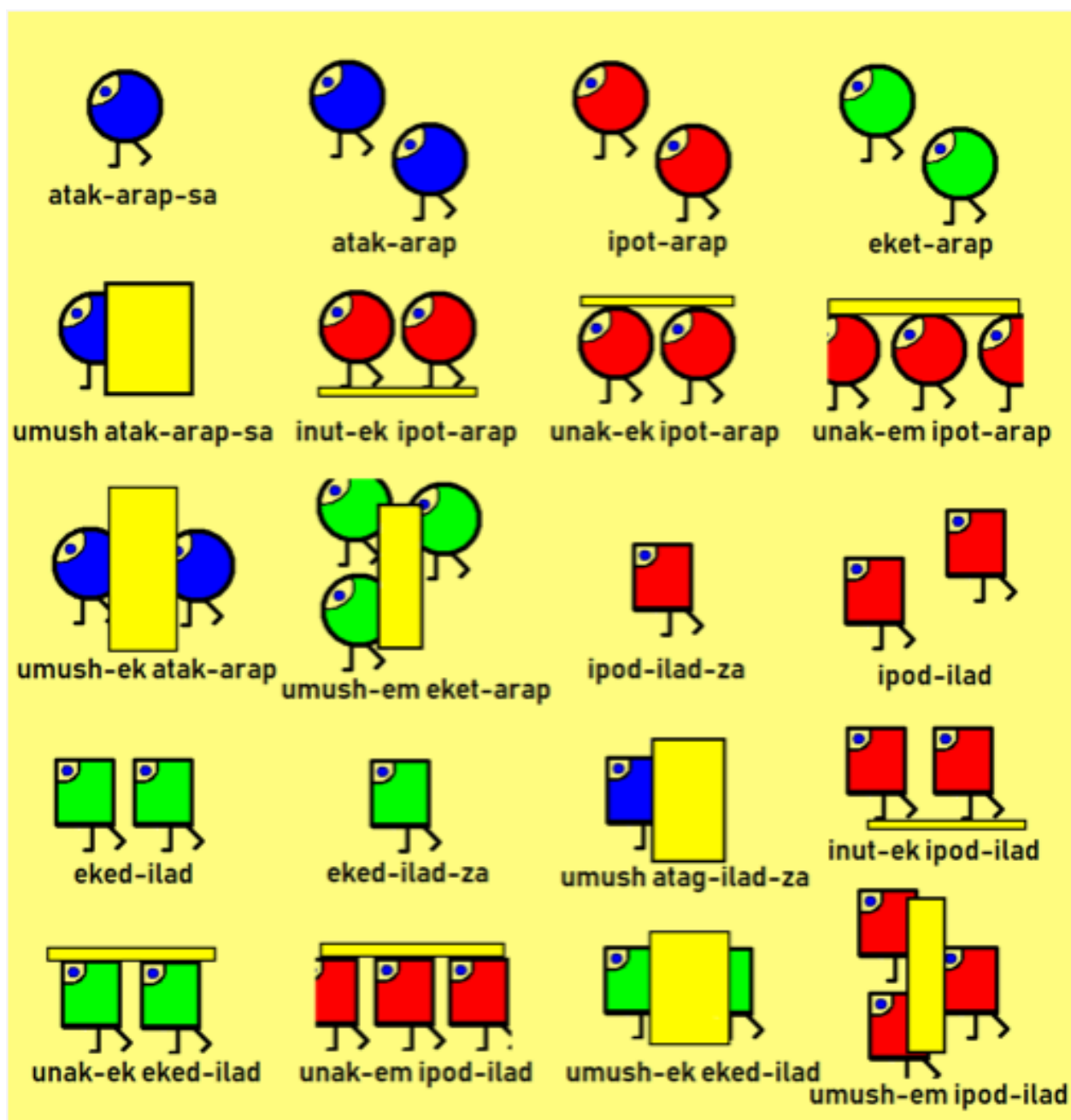
Once you click NEXT to go to the next page, the learning portion will begin. You will see a number of images, all on one page, and a sentence expressing what is in the image. You will have **five minutes** to study the images and learn the artificial grammar. You may take as many notes as you like. After the five minutes have elapsed, you will be tested on your knowledge of the artificial grammar.

Click the NEXT button when you are ready to start. The five-minute timer will begin immediately after you proceed to the next page.

هذا الاختبار يمتحن قدرتك على القيام بالاستنتاجات النحوية.

عندما تضغط على NEXT لتنتقل إلى الصفحة القادمة، سيبدأ قسم التعلم. ستري مجموعة من الصور، كلها في صفحة واحدة، وتحت كل واحدة جملة تعبر عما في الصورة. سيكون معك **خمس دقائق** لدراسة الصور وتعلم هذا النحو المصطنع. بإمكانك أخذ الملاحظات قدر ما أردت. بعد انتهاء الدقائق الخمس، ستمتحن في معرفتك لهذا النحو المصطنع.

اضغط على NEXT عندما تكون مستعداً أن تبدأ. سيبدأ عدّاد الدقائق الخمس فور انتقالك إلى الصفحة التالية.

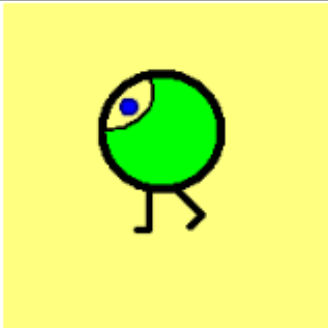
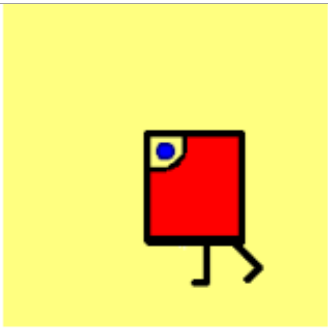
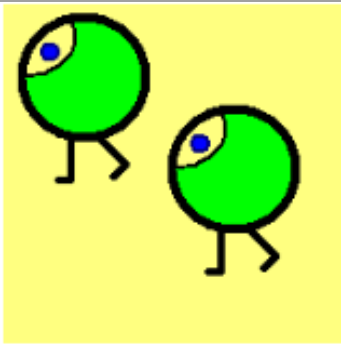


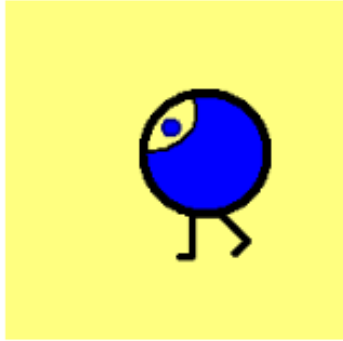
Now you will be tested on what you just learned. Once you click NEXT to go to the next page, the testing portion will begin. On each page, you will see an image and two sentences. Please select the sentence that goes with the image.

You must answer each question to move to the next one. Click NEXT to proceed from one page to the next.

الآن ستمتحن في ما تعلمته . عندما تضغط على NEXT تنتقل إلى الصفحة القادمة، سيبدأ قسم الفحص . في كل صفحة، ستري صورة وجملتين. حدّد الجملة التي تطابق الصورة.

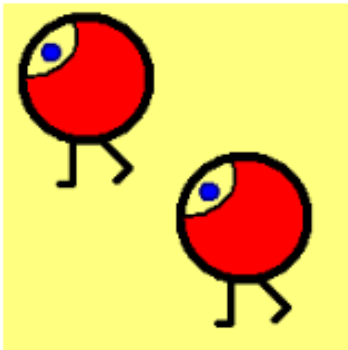
عليك الإجابة عن كل سؤال قبل الانتقال إلى السؤال الذي يليه. اضغط على NEXT للانتقال من صفحة إلى أخرى.

	Target Response (A = first choice; B = second choice)
 <p> <input type="radio"/> eket-arap-sa  <input type="radio"/> eket-arap         </p>	A
 <p> <input type="radio"/> ipod-ilad-za  <input type="radio"/> ipod-ilad         </p>	A
 <p> <input type="radio"/> ilad-eked  <input type="radio"/> eked-ilad         </p>	Neither (question discarded from analysis)



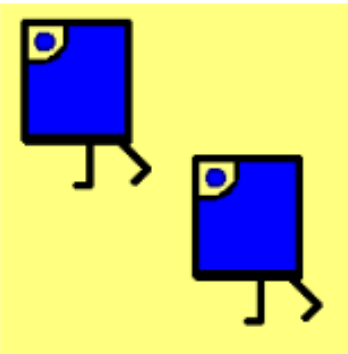
- ☐ atak-arap-sa
- ☐ arap-atak-sa

*A*



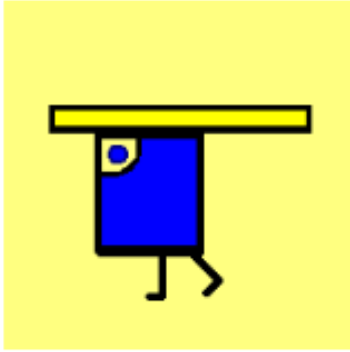
- ☐ ipod-arap
- ☐ ipot-arap

*B*



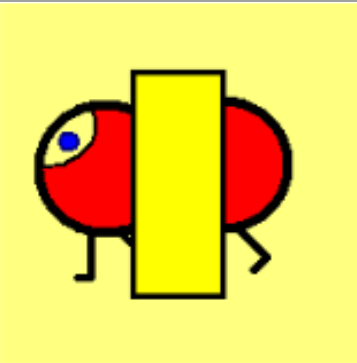
- ☐ atag-ilad
- ☐ ilad-atag

*A*



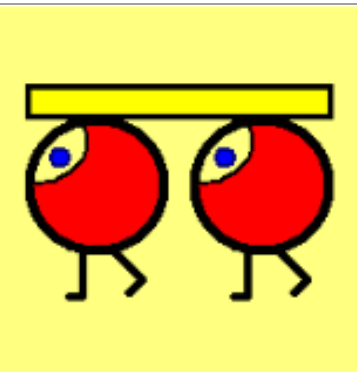
- ☐ unak atag-ilad-za
- ☐ atag-ilad-za unak

*A*



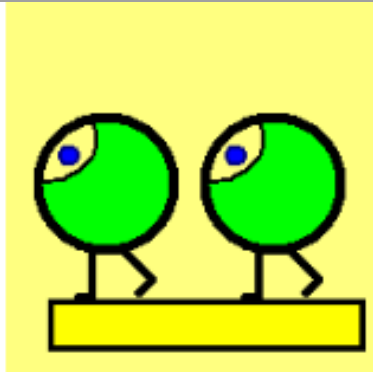
- ☐ ipot-arap umush-ek
- ☐ umush-ek ipot-arap

*B*



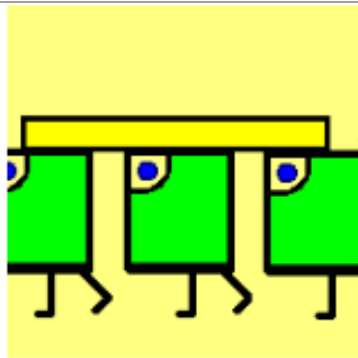
- ☐ unak-ek ipot-arap
- ☐ unak ipot-arap

*A*



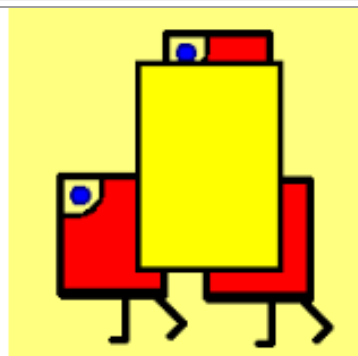
- ☐ inut-ek eket-arap  
☐ eket-ek inut-arap

*A*



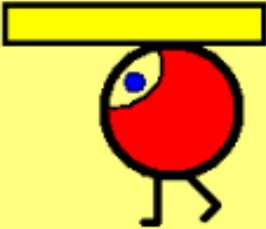
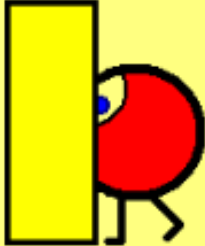

- ☐ unak-em eked-ilad  
☐ unak-ek eked-ilad

*A*

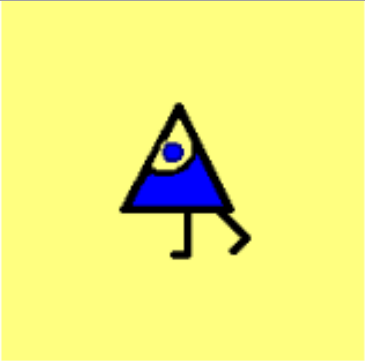
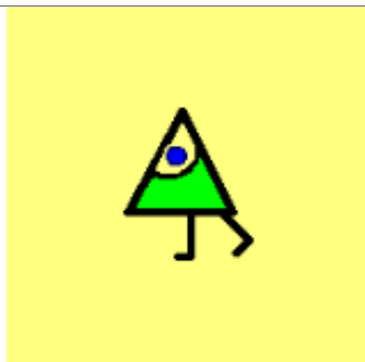
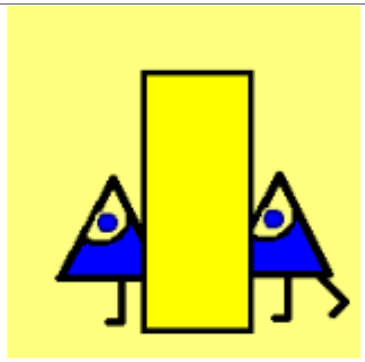


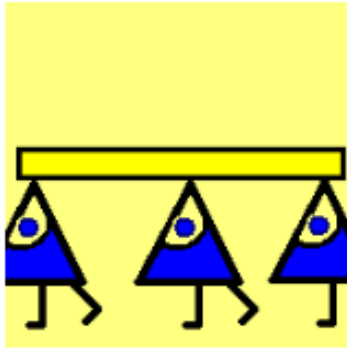
- ☐ umush-em ipod-ilad  
☐ umush-ek ipod-ilad

*A*

<div data-bbox="318 195 686 562">  </div> <div data-bbox="311 590 604 693"> <p><input type="radio"/> unak-sa ipot-arap-sa</p> <p><input type="radio"/> unak ipot-arap-sa</p> </div>	<p><i>B</i></p>
<div data-bbox="318 720 686 1077">  </div> <div data-bbox="311 1100 623 1201"> <p><input type="radio"/> umush ipot-arap-sa</p> <p><input type="radio"/> umush-ek ipot-arap-sa</p> </div>	<p><i>A</i></p>
<div data-bbox="318 1232 686 1583">  </div> <div data-bbox="311 1608 518 1709"> <p><input type="radio"/> ipod-orad-za</p> <p><input type="radio"/> ipod-orad</p> </div>	<p><i>A</i></p>

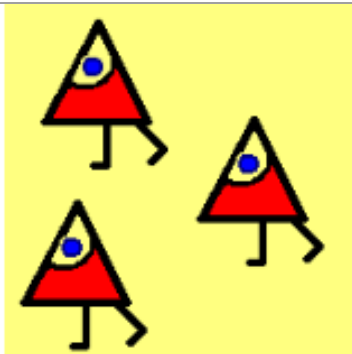


 <p> <input type="radio"/> atag-orad-sa  <input type="radio"/> atag-orad-za         </p>	<p><i>B</i></p>
 <p> <input type="radio"/> orad-eked-za  <input type="radio"/> eked-orad-za         </p>	<p><i>B</i></p>
 <p> <input type="radio"/> umush-ek atag-orad  <input type="radio"/> umush atag-orad         </p>	<p><i>A</i></p>



- ☐ unak-ek atag-orad
- ☐ unak-em atag-orad

*B*



- ☐ em ipod-orad
- ☐ ipod-orad

*A*

## APPENDIX C: ELICITED IMITATION TASKS (EITS)

### ENGLISH

In this section, you will hear a series of sentences **in English**, and you will be asked to repeat each sentence into your recording device after you hear it. You will push the PLAY AUDIO button to play each sentence, and once a sentence has played, **you will not be able to hear it again**, so make sure you are listening attentively each time you push the button.

As soon as you hear each sentence, **repeat what you heard to the best of your ability**, speaking clearly into your recording device. If you do not remember any part of the sentence at all, say "I don't know." Then hit the NEXT button to move on to the next sentence. Do not stop your recording at any time, even when you reach the end of this part of the experiment.

في هذا القسم، ستسمع مجموعة من الجمل **بالإنجليزية**، والمطلوب منك أن تكرر كل جملة في جهاز التسجيل. ستضغط على زر PLAY AUDIO لسماع كل جملة، وبعد سماع الجملة لن تتمكن من سماعها ثانية، لذلك تأكد من أنك تستمع بانتباه في كل مرة تضغط فيها على الزر.

حالما تسمع كل جملة، **كرر ما سمعته على قدر ما تستطيع**. تكلم بوضوح في جهاز التسجيل. إذا لم تتذكر الجملة إطلاقاً، قل I don't know. ثم اضغط على NEXT للانتقال إلى الجملة التالية. لا توقف التسجيل في أي وقت، حتى عندما تصل إلى نهاية هذا الجزء من التجربة.

#### **Sentences with Subject-Verb-Object word order with compound verbs with one auxiliary or modal verb**

They are eating the bananas in the park.

The boy must sweep the floor in the kitchen.

She can bring the glass to the table.

#### **Sentences with Subject-Verb-Object word order with compound verbs with two auxiliary verbs or one auxiliary verb and one modal verb**

The policeman has been looking at us.

The kitten could have hit the ball down the stairs.

They have been riding the horse around the garden.

#### **Sentences with short actional passives**

The books were taken to the office.

He was pushed hard against the ground.

She was stopped at the big red lights.

#### **Sentences with long actional passives or non-actional passives**

The mother was followed by the girl.  
He was kicked by the donkey at the farm.  
She was seen by the doctor in the morning.

**Questions with *who*, *what*, or *which* in object position**

Who did the monkey splash near the water?  
What did the princess buy last month?  
Which drink did the neighbor spill in the house?  
Who have they seen near the steps?  
What did the father cook in the evening?  
Which picture did he paint at home yesterday?

**Sentences with *before*, *after*, or *because* clauses as sentential adjuncts**

The child ate breakfast after he washed his face.  
He will feed the cow before he waters the plants.  
She went to the nurse because she was sick.

**Sentences with conditionals as sentential adjuncts**

The people will get a present if they clean the house.  
If the kids behave we will go to the playground.  
He wouldn't have brought his friend if she was nasty.

**Sentences with right-branching object relative clauses**

The children enjoyed the cake that they tasted.  
The mom cooked the meal that the children are eating.  
He should wash the baby that the child is patting.

**Sentences with center-embedded object relative clauses**

The horse that the farmer pushed kicked him in the back.  
The boy that the milkman helped has lost his way.  
The bee that the man swallowed had hurt him.

ARABIC

In this section, you will hear a series of sentences **in Palestinian Arabic**, and you will be asked to repeat each sentence into your recording device after you hear it. You will push the PLAY AUDIO button to play each sentence, and once a sentence has played, **you will not be able to hear it again**, so make sure you are listening attentively each time you push the button.

As soon as you hear each sentence, **repeat what you heard to the best of your ability**, speaking clearly into your recording device. If you do not remember any part of the sentence at all, say "I don't know." Then hit the NEXT button to move on to the next sentence. Do not stop your recording at any time, even when you reach the end of this part of the experiment.

في هذا القسم، ستسمع مجموعة من الجمل **بالعربية العامية الفلسطينية**، والمطلوب منك أن تكرر كل جملة في جهاز التسجيل. ستضغط على زر PLAY AUDIO لسماع كل جملة، وبعد سماع الجملة لن تتمكن من سماعها ثانية، لذلك تأكد من أنك تستمع بانتباه في كل مرة تضغط فيها على الزر.

حالما تسمع كل جملة، **كرر ما سمعته على قدر ما تستطيع**. تكلم بوضوح في جهاز التسجيل. إذا لم تتذكر الجملة إطلاقاً، قل I don't know. ثم اضغط على NEXT للانتقال إلى الجملة التالية. لا توقف التسجيل في أي وقت، حتى عندما تصل إلى نهاية هذا الجزء من التجربة.

#### **Sentences with imperative verbs and no plurals, clitics, or feminine nouns without feminine-gender marking**

أطبخ الحاجة الكبيرة بالفرن.  
افتح العلبة الصغيرة بالصالون.  
نظف الطاولة الجديدة.

#### **Sentences with imperative verbs and broken plurals containing glides**

ضيّف الضيوف فواكة.  
إعزم عيّل الحارة ع الحفلة.  
شوف الفيلة اللي واقفين هون.

#### **Sentences with imperative verbs and broken plurals containing broken geminates**

إحكي قصص لّلي فايق.  
سكّر كل الشبابيك اللي بالمطبخ.  
إلعب أربع دقوق شدة بكرة.

#### **Sentences with imperative verbs and broken plurals not containing glides or broken geminates**

وقّف عند التماثيل وإنّت مكثّر.  
إقرأ كل الكتب اللي بالمكتبة.  
إغسل كل القمصان اللي مش بالخزانة.

#### **Sentences with imperative verbs and sound masculine plurals**

سلّم ع كل المعلمين اللي عيّانين اليوم.  
اتّصل بكل الطّباخين اللي ساكنين هون.  
أطلب من البيّاعين كل الوضولة.

#### **Sentences with imperative verbs and sound feminine plurals**

قُول لواحدة من المذيعات إنه المدير هون.  
صَوِّر المُمَرَّضات اللي بالمكتب.  
أرسم الرقاصات وإنت قاعد.

#### Sentences with imperative verbs and clitics

إنتبه لكل إشي قدامك.  
جيب معاك الموز والخوخ والتين.  
كُول أكلك بغرفة السفرة.

#### Sentences with imperative verbs and feminine nouns without feminine-gender marking followed by feminine adjectives

إشرب ميّ باردة مع لَمون ونعنع.  
أدرس عن الحرب الطويلة ضد العراق.  
بيع الدار الحلوة اللي بالقرية.

#### Sentences with present-tense verbs

يَعْرِف كل مطعم ومتحف بالبلد.  
بتشتغلي بالبنك القريب ولا البعيد؟  
يُعزفوا موسيقى.

#### Sentences with past-tense verbs

رَقَصْت كثير مبارح بالعرس.  
ركبتي الحصان اللي شكله غريب؟  
نمتموا بالأوتيل اللي قبال الملعب؟

## APPENDIX D: TRUTH VALUE JUDGMENT TASKS (TVJTS)

*Below, items in plain text were included in List 1, and items in italics were included in List 2. Each row indicates a token set. Conditions are abbreviated using the three-character abbreviations used elsewhere in this dissertation.*

### ENGLISH – INSTRUCTIONS

In this section, you will be presented with a series of very short stories **in English**. Each story will be followed by a space and a statement, and you will be asked to indicate whether the statement is true or false in the context of the story. You may read and/or listen to each story and statement as many times as you'd like. In the audio version of each story, a short tone will play between the story and the statement. Click NEXT to move from story to story.

في هذا القسم، ستري مجموعة من القصص القصيرة **بالإنجليزية**، وبعد كل قصة فراغ ومن ثم جملة، و عليك أن تحدد ما إذا كانت هذه الجملة صحيحة أم خاطئة في سياق القصة. بإمكانك قراءة كل قصة والجملة التي تليها أو السماع إليهما، أو الاثنين، أي عدد من المرات. في القصص المسموعة ستسمع نغمة قصيرة بين كل قصة والجملة التي تتبعها. اضغط على NEXT للانتقال من قصة إلى أخرى.

### ENGLISH – ARTICLE SEMANTICS

THT (true)	BRT (true)	THF (false)	BRF (false)
<p>Last night, I saw a movie about two very strange chickens. They have three legs, instead of two. That's so weird. Everyone knows that a chicken normally has two legs.</p> <p>TRUE OR FALSE: The chickens have three legs.</p>	<p>Last night, I saw a movie about two very strange chickens. They have three legs, instead of two. That's so weird. Everyone knows that a chicken normally has two legs.</p> <p>TRUE OR FALSE: Chickens have two legs.</p>	<p><i>Last night, I saw a movie about two very strange chickens. They have three legs, instead of two. That's so weird. Everyone knows that a chicken normally has two legs.</i></p> <p><i>TRUE OR FALSE: The chickens have two legs.</i></p>	<p><i>Last night, I saw a movie about two very strange chickens. They have three legs, instead of two. That's so weird. Everyone knows that a chicken normally has two legs.</i></p> <p><i>TRUE OR FALSE: Chickens have three legs.</i></p>

<p><i>Everyone knows that a horse walks on four legs. But my friend has two very unusual horses: they only have one leg, instead of four. It must be difficult.</i></p> <p><b>TRUE OR FALSE:</b> <i>The horses have one leg.</i></p>	<p><i>Everyone knows that a horse walks on four legs. But my friend has two very unusual horses: they only have one leg, instead of four. It must be difficult.</i></p> <p><b>TRUE OR FALSE:</b> <i>Horses have four legs.</i></p>	<p>Everyone knows that a horse walks on four legs. But my friend has two very unusual horses: they only have one leg, instead of four. It must be difficult.</p> <p><b>TRUE OR FALSE:</b> The horses have four legs.</p>	<p>Everyone knows that a horse walks on four legs. But my friend has two very unusual horses: they only have one leg, instead of four. It must be difficult.</p> <p><b>TRUE OR FALSE:</b> Horses have one leg.</p>
<p>I've heard about two very strange robins. They don't build nests, like all other robins. Instead, they live in caves.</p> <p><b>TRUE OR FALSE:</b> The robins live in caves.</p>	<p>I've heard about two very strange robins. They don't build nests, like all other robins. Instead, they live in caves.</p> <p><b>TRUE OR FALSE:</b> Robins build nests.</p>	<p><i>I've heard about two very strange robins. They don't build nests, like all other robins. Instead, they live in caves.</i></p> <p><b>TRUE OR FALSE:</b> <i>The robins build nests.</i></p>	<p><i>I've heard about two very strange robins. They don't build nests, like all other robins. Instead, they live in caves.</i></p> <p><b>TRUE OR FALSE:</b> <i>Robins live in caves.</i></p>
<p><i>At our zoo, we have two very unusual tigers. All other tigers eat meat all the time. But our two tigers are vegetarian: they love to eat carrots, and they hate meat.</i></p> <p><b>TRUE OR FALSE:</b> <i>The tigers are vegetarian.</i></p>	<p><i>At our zoo, we have two very unusual tigers. All other tigers eat meat all the time. But our two tigers are vegetarian: they love to eat carrots, and they hate meat.</i></p> <p><b>TRUE OR FALSE:</b> <i>Tigers eat meat.</i></p>	<p>At our zoo, we have two very unusual tigers. All other tigers eat meat all the time. But our two tigers are vegetarian: they love to eat carrots, and they hate meat.</p> <p><b>TRUE OR FALSE:</b> The tigers eat meat.</p>	<p>At our zoo, we have two very unusual tigers. All other tigers eat meat all the time. But our two tigers are vegetarian: they love to eat carrots, and they hate meat.</p> <p><b>TRUE OR FALSE:</b> Tigers are vegetarian.</p>



<p>Everyone knows that a zebra always has stripes. But not at our zoo. Our zoo has two zebras, and they are really unusual: they have spots instead of stripes. That's really strange.</p> <p>TRUE OR FALSE: The zebras have spots.</p>	<p>Everyone knows that a zebra always has stripes. But not at our zoo. Our zoo has two zebras, and they are really unusual: they have spots instead of stripes. That's really strange.</p> <p>TRUE OR FALSE: Zebras have stripes.</p>	<p><i>Everyone knows that a zebra always has stripes. But not at our zoo. Our zoo has two zebras, and they are really unusual: they have spots instead of stripes. That's really strange.</i></p> <p>TRUE OR FALSE: <i>The zebras have stripes.</i></p>	<p><i>Everyone knows that a zebra always has stripes. But not at our zoo. Our zoo has two zebras, and they are really unusual: they have spots instead of stripes. That's really strange.</i></p> <p>TRUE OR FALSE: <i>Zebras have spots.</i></p>
<p><i>I have two cats that are really unusual. All other cats like milk. But my cats are different: they hate milk, but they love to drink black coffee. Every morning they have coffee for breakfast.</i></p> <p>TRUE OR FALSE: <i>The cats drink coffee.</i></p>	<p><i>I have two cats that are really unusual. All other cats like milk. But my cats are different: they hate milk, but they love to drink black coffee. Every morning they have coffee for breakfast.</i></p> <p>TRUE OR FALSE: <i>Cats like milk.</i></p>	<p>I have two cats that are really unusual. All other cats like milk. But my cats are different: they hate milk, but they love to drink black coffee. Every morning they have coffee for breakfast.</p> <p>TRUE OR FALSE: The cats like milk.</p>	<p>I have two cats that are really unusual. All other cats like milk. But my cats are different: they hate milk, but they love to drink black coffee. Every morning they have coffee for breakfast.</p> <p>TRUE OR FALSE: Cats drink coffee.</p>
<p>I bought two turtles at the pet shop. They are very unusual turtles: they move very fast. In fact, they run all the time. That's really strange: all other turtles are so slow.</p> <p>TRUE OR FALSE: The turtles are fast.</p>	<p>I bought two turtles at the pet shop. They are very unusual turtles: they move very fast. In fact, they run all the time. That's really strange: all other turtles are so slow.</p> <p>TRUE OR FALSE: Turtles are slow.</p>	<p><i>I bought two turtles at the pet shop. They are very unusual turtles: they move very fast. In fact, they run all the time. That's really strange: all other turtles are so slow.</i></p> <p>TRUE OR FALSE: <i>The turtles are slow.</i></p>	<p><i>I bought two turtles at the pet shop. They are very unusual turtles: they move very fast. In fact, they run all the time. That's really strange: all other turtles are so slow.</i></p> <p>TRUE OR FALSE: <i>Turtles are fast.</i></p>

<p><i>I read a story about two strange lions. They don't live in the jungle, like all other lions. They live on a boat. And they never get seasick.</i></p> <p><b>TRUE OR FALSE:</b> <i>The lions live on a boat.</i></p>	<p><i>I read a story about two strange lions. They don't live in the jungle, like all other lions. They live on a boat. And they never get seasick.</i></p> <p><b>TRUE OR FALSE:</b> <i>Lions live in the jungle.</i></p>	<p>I read a story about two strange lions. They don't live in the jungle, like all other lions. They live on a boat. And they never get seasick.</p> <p><b>TRUE OR FALSE:</b> The lions live in the jungle.</p>	<p>I read a story about two strange lions. They don't live in the jungle, like all other lions. They live on a boat. And they never get seasick.</p> <p><b>TRUE OR FALSE:</b> Lions live on a boat.</p>
<p>I recently heard about four very strange rabbits. All other rabbits love carrots, but not these rabbits. They hate carrots, and they only eat chocolate. It's very strange.</p> <p><b>TRUE OR FALSE:</b> The rabbits eat chocolate.</p>	<p>I recently heard about four very strange rabbits. All other rabbits love carrots, but not these rabbits. They hate carrots, and they only eat chocolate. It's very strange.</p> <p><b>TRUE OR FALSE:</b> Rabbits eat carrots.</p>	<p><i>I recently heard about four very strange rabbits. All other rabbits love carrots, but not these rabbits. They hate carrots, and they only eat chocolate. It's very strange.</i></p> <p><b>TRUE OR FALSE:</b> <i>The rabbits eat carrots.</i></p>	<p><i>I recently heard about four very strange rabbits. All other rabbits love carrots, but not these rabbits. They hate carrots, and they only eat chocolate. It's very strange.</i></p> <p><b>TRUE OR FALSE:</b> <i>Rabbits eat chocolate.</i></p>
<p><i>Everyone knows that an elephant has a trunk. But at the zoo I usually go to, they have four very unusual elephants. Instead of trunks, they have noses. It's quite a sight.</i></p> <p><b>TRUE OR FALSE:</b> <i>The elephants have noses.</i></p>	<p><i>Everyone knows that an elephant has a trunk. But at the zoo I usually go to, they have four very unusual elephants. Instead of trunks, they have noses. It's quite a sight.</i></p> <p><b>TRUE OR FALSE:</b> <i>Elephants have trunks.</i></p>	<p>Everyone knows that an elephant has a trunk. But at the zoo I usually go to, they have four very unusual elephants. Instead of trunks, they have noses. It's quite a sight.</p> <p><b>TRUE OR FALSE:</b> The elephants have trunks.</p>	<p>Everyone knows that an elephant has a trunk. But at the zoo I usually go to, they have four very unusual elephants. Instead of trunks, they have noses. It's quite a sight.</p> <p><b>TRUE OR FALSE:</b> Elephants have noses.</p>

Everyone knows that a giraffe has a long neck. But at the zoo in my town, they have two unusual giraffes. Their necks are short, not long. They almost don't look like giraffes.	Everyone knows that a giraffe has a long neck. But at the zoo in my town, they have two unusual giraffes. Their necks are short, not long. They almost don't look like giraffes.	<i>Everyone knows that a giraffe has a long neck. But at the zoo in my town, they have two unusual giraffes. Their necks are short, not long. They almost don't look like giraffes.</i>	<i>Everyone knows that a giraffe has a long neck. But at the zoo in my town, they have two unusual giraffes. Their necks are short, not long. They almost don't look like giraffes.</i>
TRUE OR FALSE: The giraffes have short necks.	TRUE OR FALSE: Giraffes have long necks.	TRUE OR FALSE: <i>The giraffes have long necks.</i>	TRUE OR FALSE: <i>Giraffes have short necks.</i>
<i>Everyone knows that all fish live in water, otherwise they can't survive. But yesterday I heard about two very unusual fish, who don't live in water but actually live on land. It's truly remarkable.</i>	<i>Everyone knows that all fish live in water, otherwise they can't survive. But yesterday I heard about two very unusual fish, who don't live in water but actually live on land. It's truly remarkable.</i>	Everyone knows that all fish live in water, otherwise they can't survive. But yesterday I heard about two very unusual fish, who don't live in water but actually live on land. It's truly remarkable.	Everyone knows that all fish live in water, otherwise they can't survive. But yesterday I heard about two very unusual fish, who don't live in water but actually live on land. It's truly remarkable.
TRUE OR FALSE: <i>The fish live on land.</i>	TRUE OR FALSE: <i>Fish live in water.</i>	TRUE OR FALSE: The fish live in water.	TRUE OR FALSE: Fish live on land.

#### ENGLISH – VERBAL ASPECT

PPP (true)	PSN (true)	PSP (false)	PPN (false)
I'm enjoying a game of chess with my friend Samantha right now. I'm surprised she agreed to play, since she normally hates playing chess and it's not one of her regular activities.	I'm enjoying a game of chess with my friend Samantha right now. I'm surprised she agreed to play, since she normally hates playing chess and it's not one of her regular activities.	<i>I'm enjoying a game of chess with my friend Samantha right now. I'm surprised she agreed to play, since she normally hates playing chess and it's not one of her regular activities.</i>	<i>I'm enjoying a game of chess with my friend Samantha right now. I'm surprised she agreed to play, since she normally hates playing chess and it's not one of her regular activities.</i>
TRUE OR FALSE: Samantha is playing chess.	TRUE OR FALSE: Samantha does not play chess.	TRUE OR FALSE: <i>Samantha plays chess.</i>	TRUE OR FALSE: <i>Samantha is not playing chess.</i>

<p><i>My friend Lisa and I are in my living room right now. We're testing my new TV, and we have the news on. This is very unusual, since Lisa always says she hates watching the news and it's definitely not one of her regular activities.</i></p> <p>TRUE OR FALSE: <i>Lisa is watching the news.</i></p>	<p><i>My friend Lisa and I are in my living room right now. We're testing my new TV, and we have the news on. This is very unusual, since Lisa always says she hates watching the news and it's definitely not one of her regular activities.</i></p> <p>TRUE OR FALSE: <i>Lisa does not watch the news.</i></p>	<p>My friend Lisa and I are in my living room right now. We're testing my new TV, and we have the news on. This is very unusual, since Lisa always says she hates watching the news and it's definitely not one of her regular activities.</p> <p>TRUE OR FALSE: Lisa watches the news.</p>	<p>My friend Lisa and I are in my living room right now. We're testing my new TV, and we have the news on. This is very unusual, since Lisa always says she hates watching the news and it's definitely not one of her regular activities.</p> <p>TRUE OR FALSE: Lisa is not watching the news.</p>
<p>My roommate Tom is out for a jog right now, which is not typical. He normally goes swimming for exercise, because he hates jogging and does not do it as a regular activity, but he wanted to try something different today.</p> <p>TRUE OR FALSE: Tom is jogging.</p>	<p>My roommate Tom is out for a jog right now, which is not typical. He normally goes swimming for exercise, because he hates jogging and does not do it as a regular activity, but he wanted to try something different today.</p> <p>TRUE OR FALSE: Tom does not jog.</p>	<p><i>My roommate Tom is out for a jog right now, which is not typical. He normally goes swimming for exercise, because he hates jogging and does not do it as a regular activity, but he wanted to try something different today.</i></p> <p>TRUE OR FALSE: <i>Tom jogs.</i></p>	<p><i>My roommate Tom is out for a jog right now, which is not typical. He normally goes swimming for exercise, because he hates jogging and does not do it as a regular activity, but he wanted to try something different today.</i></p> <p>TRUE OR FALSE: <i>Tom is not jogging.</i></p>

<p><i>My friend Lucy is in the process of baking bread in the kitchen. I was pleasantly surprised to hear that she was going to bake, because normally she hates doing anything in the kitchen, so baking is definitely not one of her regular activities.</i></p> <p>TRUE OR FALSE: <i>Lucy is baking bread.</i></p>	<p><i>My friend Lucy is in the process of baking bread in the kitchen. I was pleasantly surprised to hear that she was going to bake, because normally she hates doing anything in the kitchen, so baking is definitely not one of her regular activities.</i></p> <p>TRUE OR FALSE: <i>Lucy does not bake bread.</i></p>	<p>My friend Lucy is in the process of baking bread in the kitchen. I was pleasantly surprised to hear that she was going to bake, because normally she hates doing anything in the kitchen, so baking is definitely not one of her regular activities.</p> <p>TRUE OR FALSE: Lucy bakes bread.</p>	<p>My friend Lucy is in the process of baking bread in the kitchen. I was pleasantly surprised to hear that she was going to bake, because normally she hates doing anything in the kitchen, so baking is definitely not one of her regular activities.</p> <p>TRUE OR FALSE: Lucy is not baking bread.</p>
<p>My friend Oscar is an artist. His favorite activities are drawing and sculpting. But not painting; that's not one of his regular activities. But today, he is working on a painting for an art competition.</p> <p>TRUE OR FALSE: Oscar is painting.</p>	<p>My friend Oscar is an artist. His favorite activities are drawing and sculpting. But not painting; that's not one of his regular activities. But today, he is working on a painting for an art competition.</p> <p>TRUE OR FALSE: Oscar does not paint.</p>	<p><i>My friend Oscar is an artist. His favorite activities are drawing and sculpting. But not painting; that's not one of his regular activities. But today, he is working on a painting for an art competition.</i></p> <p>TRUE OR FALSE: <i>Oscar paints.</i></p>	<p><i>My friend Oscar is an artist. His favorite activities are drawing and sculpting. But not painting; that's not one of his regular activities. But today, he is working on a painting for an art competition.</i></p> <p>TRUE OR FALSE: <i>Oscar is not painting.</i></p>
<p><i>My roommate Claire hates coffee and usually doesn't get anywhere near it. But she only got three hours of sleep last night, and she has a meeting in an hour, so she's having a cup of coffee to try to stay awake.</i></p> <p>TRUE OR FALSE: <i>Claire is drinking coffee.</i></p>	<p><i>My roommate Claire hates coffee and usually doesn't get anywhere near it. But she only got three hours of sleep last night, and she has a meeting in an hour, so she's having a cup of coffee to try to stay awake.</i></p> <p>TRUE OR FALSE: <i>Claire does not drink coffee.</i></p>	<p>My roommate Claire hates coffee and usually doesn't get anywhere near it. But she only got three hours of sleep last night, and she has a meeting in an hour, so she's having a cup of coffee to try to stay awake.</p> <p>TRUE OR FALSE: Claire drinks coffee.</p>	<p>My roommate Claire hates coffee and usually doesn't get anywhere near it. But she only got three hours of sleep last night, and she has a meeting in an hour, so she's having a cup of coffee to try to stay awake.</p> <p>TRUE OR FALSE: Claire is not drinking coffee.</p>

<p>My coworker Paul is not a smoker. He's always talking about the dangers of tobacco, and he stays away from cigarettes. But today he got a raise and got talked into having a celebratory cigarette, which he's actually consuming right now.</p> <p>TRUE OR FALSE: Paul is smoking.</p>	<p>My coworker Paul is not a smoker. He's always talking about the dangers of tobacco, and he stays away from cigarettes. But today he got a raise and got talked into having a celebratory cigarette, which he's actually consuming right now.</p> <p>TRUE OR FALSE: Paul does not smoke.</p>	<p><i>My coworker Paul is not a smoker. He's always talking about the dangers of tobacco, and he stays away from cigarettes. But today he got a raise and got talked into having a celebratory cigarette, which he's actually consuming right now.</i></p> <p><i>TRUE OR FALSE: Paul smokes.</i></p>	<p><i>My coworker Paul is not a smoker. He's always talking about the dangers of tobacco, and he stays away from cigarettes. But today he got a raise and got talked into having a celebratory cigarette, which he's actually consuming right now.</i></p> <p><i>TRUE OR FALSE: Paul is not smoking.</i></p>
<p><i>Pamela's regular household activities include doing the laundry and cleaning the windows, but not washing dishes. But today, Melanie, who is usually in charge of washing the dishes, is sick, so Pamela is doing it for her.</i></p> <p>TRUE OR FALSE: Pamela is washing dishes.</p>	<p><i>Pamela's regular household activities include doing the laundry and cleaning the windows, but not washing dishes. But today, Melanie, who is usually in charge of washing the dishes, is sick, so Pamela is doing it for her.</i></p> <p>TRUE OR FALSE: Pamela does not wash dishes.</p>	<p>Pamela's regular household activities include doing the laundry and cleaning the windows, but not washing dishes. But today, Melanie, who is usually in charge of washing the dishes, is sick, so Pamela is doing it for her.</p> <p>TRUE OR FALSE: Pamela washes dishes.</p>	<p>Pamela's regular household activities include doing the laundry and cleaning the windows, but not washing dishes. But today, Melanie, who is usually in charge of washing the dishes, is sick, so Pamela is doing it for her.</p> <p>TRUE OR FALSE: Pamela is not washing dishes.</p>

<p>Barry and I are enjoying a delicious breakfast at the local diner. This is a special treat, as Barry usually has only lunch and dinner. But I really wanted to see him today and I was only free for breakfast, so he decided to make an exception and meet me for breakfast.</p> <p>TRUE OR FALSE: Barry is eating breakfast.</p>	<p>Barry and I are enjoying a delicious breakfast at the local diner. This is a special treat, as Barry usually has only lunch and dinner. But I really wanted to see him today and I was only free for breakfast, so he decided to make an exception and meet me for breakfast.</p> <p>TRUE OR FALSE: Barry does not eat breakfast.</p>	<p><i>Barry and I are enjoying a delicious breakfast at the local diner. This is a special treat, as Barry usually has only lunch and dinner. But I really wanted to see him today and I was only free for breakfast, so he decided to make an exception and meet me for breakfast.</i></p> <p><i>TRUE OR FALSE: Barry eats breakfast.</i></p>	<p><i>Barry and I are enjoying a delicious breakfast at the local diner. This is a special treat, as Barry usually has only lunch and dinner. But I really wanted to see him today and I was only free for breakfast, so he decided to make an exception and meet me for breakfast.</i></p> <p><i>TRUE OR FALSE: Barry is not eating breakfast.</i></p>
<p><i>Allison is in the kitchen making spaghetti. Before today, Allison had never before cooked in her life, but today she decided to try it out.</i></p> <p><i>TRUE OR FALSE: Allison is cooking.</i></p>	<p><i>Allison is in the kitchen making spaghetti. Before today, Allison had never before cooked in her life, but today she decided to try it out.</i></p> <p><i>TRUE OR FALSE: Allison does not cook.</i></p>	<p>Allison is in the kitchen making spaghetti. Before today, Allison had never before cooked in her life, but today she decided to try it out.</p> <p>TRUE OR FALSE: Allison cooks.</p>	<p>Allison is in the kitchen making spaghetti. Before today, Allison had never before cooked in her life, but today she decided to try it out.</p> <p>TRUE OR FALSE: Allison is not cooking.</p>

My friend Greg surprised me today by telling me that he had never listened to any of Madonna's songs before! I said we had to change that, so right now we're in my living room, with my favorite Madonna CD playing. So far Greg seems to like it!	My friend Greg surprised me today by telling me that he had never listened to any of Madonna's songs before! I said we had to change that, so right now we're in my living room, with my favorite Madonna CD playing. So far Greg seems to like it!	<i>My friend Greg surprised me today by telling me that he had never listened to any of Madonna's songs before! I said we had to change that, so right now we're in my living room, with my favorite Madonna CD playing. So far Greg seems to like it!</i>	<i>My friend Greg surprised me today by telling me that he had never listened to any of Madonna's songs before! I said we had to change that, so right now we're in my living room, with my favorite Madonna CD playing. So far Greg seems to like it!</i>
TRUE OR FALSE: Greg is listening to Madonna.	TRUE OR FALSE: Greg does not listen to Madonna.	TRUE OR FALSE: <i>Greg listens to Madonna.</i>	TRUE OR FALSE: <i>Greg is not listening to Madonna.</i>
<i>My roommate Jennifer had never used an iron before today. She asked if I could teach her how to use one, so I did. Right now she's in the laundry room trying one out for herself.</i>	<i>My roommate Jennifer had never used an iron before today. She asked if I could teach her how to use one, so I did. Right now she's in the laundry room trying one out for herself.</i>	My roommate Jennifer had never used an iron before today. She asked if I could teach her how to use one, so I did. Right now she's in the laundry room trying one out for herself.	My roommate Jennifer had never used an iron before today. She asked if I could teach her how to use one, so I did. Right now she's in the laundry room trying one out for herself.
TRUE OR FALSE: <i>Jennifer is ironing.</i>	TRUE OR FALSE: <i>Jennifer does not iron.</i>	TRUE OR FALSE: Jennifer irons.	TRUE OR FALSE: Jennifer is not ironing.

## ARABIC – INSTRUCTIONS

In this section, you will be presented with a series of very short stories **in Palestinian Arabic**. Each story will be followed by a space and a statement, and you will be asked to indicate whether the statement is true or false in the context of the story. You may read and/or listen to each story and statement as many times as you'd like. In the audio version of each story, a short tone will play between the story and the statement. Click NEXT to move from story to story.

في هذا القسم، سترى مجموعة من القصص القصيرة **بالعربية العامية الفلسطينية**، وبعد كل قصة فراغ ومن ثم جملة، وعليك أن تحدد ما إذا كانت هذه الجملة صحيحة أم خاطئة في سياق القصة. بإمكانك قراءة كل قصة والجملة التي تليها أو السماع إليهما، أو الاثنين، أي عدد من المرات. في القصص المسموعة سنتسمع نغمة قصيرة بين كل قصة والجملة التي تتبعها. اضغط على NEXT للانتقال من قصة إلى أخرى.

## ARABIC – ARTICLE SEMANTICS



SPC (true)	GNC (true)	DEM (false)	ALL (false)
مبارح حضرت فيلم عن تلات عسافير كثير غريبين. إلهم تلات إجرين، مش بس أجرتين. إشي غريب عجيب. الكل بعرف إنه العصفور إله إجرتين.	مبارح حضرت فيلم عن تلات عسافير كثير غريبين. إلهم تلات إجرين، مش بس أجرتين. إشي غريب عجيب. الكل بعرف إنه العصفور إله إجرتين.	مبارح حضرت فيلم عن تلات عسافير كثير غريبين. إلهم تلات إجرين، مش بس أجرتين. إشي غريب عجيب. الكل بعرف إنه العصفور إله إجرتين.	مبارح حضرت فيلم عن تلات عسافير كثير غريبين. إلهم تلات إجرين، مش بس أجرتين. إشي غريب عجيب. الكل بعرف إنه العصفور إله إجرتين.
العسافير إلهم تلات إجرين. صح ولا غلط؟	العسافير إلهم إجرتين. صح ولا غلط؟	هدول العسافير إلهم إجرتين. صح ولا غلط؟	كل العسافير بالعالم إلهم تلات إجرين. صح ولا غلط؟
الكل بعرف إنه الحمار إله أربع إجرين. بس عمي عنده أربع حمير كثير غريبين. إلهم إجر واحدة بس، مش أربع إجرين. أكيد بستصعبوا يمشوا.	الكل بعرف إنه الحمار إله أربع إجرين. بس عمي عنده أربع حمير كثير غريبين. إلهم إجر واحدة بس، مش أربع إجرين. أكيد بستصعبوا يمشوا.	الكل بعرف إنه الحمار إله أربع إجرين. بس عمي عنده أربع حمير كثير غريبين. إلهم إجر واحدة بس، مش أربع إجرين. أكيد بستصعبوا يمشوا.	الكل بعرف إنه الحمار إله أربع إجرين. بس عمي عنده أربع حمير كثير غريبين. إلهم إجر واحدة بس، مش أربع إجرين. أكيد بستصعبوا يمشوا.
الحمير إلهم إجر واحدة. صح ولا غلط؟	الحمير إلهم أربع إجرين. صح ولا غلط؟	هدول الحمير إلهم أربع إجرين. صح ولا غلط؟	كل الحمير بالعالم إلهم إجر واحدة. صح ولا غلط؟
من جديد سمعت عن أربع أرانب كثير غريبين. الأرنب عادة بحب الجزر وبحبش الشوكولاتة، بس هدولا لأ. بحبوش الجزر، وبس بوكلوا شوكولاتة. إشي غريب عجيب.	من جديد سمعت عن أربع أرانب كثير غريبين. الأرنب عادة بحب الجزر وبحبش الشوكولاتة، بس هدولا لأ. بحبوش الجزر، وبس بوكلوا شوكولاتة. إشي غريب عجيب.	من جديد سمعت عن أربع أرانب كثير غريبين. الأرنب عادة بحب الجزر وبحبش الشوكولاتة، بس هدولا لأ. بحبوش الجزر، وبس بوكلوا شوكولاتة. إشي غريب عجيب.	من جديد سمعت عن أربع أرانب كثير غريبين. الأرنب عادة بحب الجزر وبحبش الشوكولاتة، بس هدولا لأ. بحبوش الجزر، وبس بوكلوا شوكولاتة. إشي غريب عجيب.
الأرانب بوكلوا شوكولاتة. صح ولا غلط؟	الأرانب بوكلوا جزر. صح ولا غلط؟	هدول الأرانب بوكلوا جزر. صح ولا غلط؟	كل الأرانب بالعالم بوكلوا شوكولاتة. صح ولا غلط؟
بجنينة الحيوانات اللي جنب بيتي في أربع نمور كثير غريبين. النمر عادة بوكل لحمة كل الوقت، بس هدولا نباتيين، بحبوا بوكلوا جزر، وبكرهوا اللحم.	بجنينة الحيوانات اللي جنب بيتي في أربع نمور كثير غريبين. النمر عادة بوكل لحمة كل الوقت، بس هدولا نباتيين، بحبوا بوكلوا جزر، وبكرهوا اللحم.	بجنينة الحيوانات اللي جنب بيتي في أربع نمور كثير غريبين. النمر عادة بوكل لحمة كل الوقت، بس هدولا نباتيين، بحبوا بوكلوا جزر، وبكرهوا اللحم.	بجنينة الحيوانات اللي جنب بيتي في أربع نمور كثير غريبين. النمر عادة بوكل لحمة كل الوقت، بس هدولا نباتيين، بحبوا بوكلوا جزر، وبكرهوا اللحم.
النمور نباتيين. صح ولا غلط؟	النمور بوكلوا لحمة. صح ولا غلط؟	هدول النمور بوكلوا لحمة. صح ولا غلط؟	كل النمور بالعالم نباتيين. صح ولا غلط؟

<p>الكل يعرف إنه الفيل إله خرطوم. بس بجنيّة الحيوانات اللي بروح عليها في أربع فيّلة كثير غريبين. إلهم منخار مش خرطوم. إشي كثير غريب.</p> <p>الفيلة إلهم منخار. صح ولا غلط؟</p>	<p>الكل يعرف إنه الفيل إله خرطوم. بس بجنيّة الحيوانات اللي بروح عليها في أربع فيّلة كثير غريبين. إلهم منخار مش خرطوم. إشي كثير غريب.</p> <p>الفيلة إلهم خرطوم. صح ولا غلط؟</p>	<p>الكل يعرف إنه الفيل إله خرطوم. بس بجنيّة الحيوانات اللي بروح عليها في أربع فيّلة كثير غريبين. إلهم منخار مش خرطوم. إشي كثير غريب.</p> <p>هدول الفيلة إلهم خرطوم. صح ولا غلط؟</p>	<p>الكل يعرف إنه الفيل إله خرطوم. بس بجنيّة الحيوانات اللي بروح عليها في أربع فيّلة كثير غريبين. إلهم منخار مش خرطوم. إشي كثير غريب.</p> <p>كل الفيلة بالعالم إلهم منخار. صح ولا غلط؟</p>
<p>عندي ثلاث بسس كثير غريبين. البسة عادة بتحب الحليب وبتشرش قهوة، بس بسسي لأ. بكر هوا الحليب، وبموتوا ع القهوة. كل يوم الصبح بشربوا قهوة.</p> <p>البسس بشربوا قهوة. صح ولا غلط؟</p>	<p>عندي ثلاث بسس كثير غريبين. البسة عادة بتحب الحليب وبتشرش قهوة، بس بسسي لأ. بكر هوا الحليب، وبموتوا ع القهوة. كل يوم الصبح بشربوا قهوة.</p> <p>البسس بشربوا حليب. صح ولا غلط؟</p>	<p>عندي ثلاث بسس كثير غريبين. البسة عادة بتحب الحليب وبتشرش قهوة، بس بسسي لأ. بكر هوا الحليب، وبموتوا ع القهوة. كل يوم الصبح بشربوا قهوة.</p> <p>هدول البسس بشربوا حليب. صح ولا غلط؟</p>	<p>عندي ثلاث بسس كثير غريبين. البسة عادة بتحب الحليب وبتشرش قهوة، بس بسسي لأ. بكر هوا الحليب، وبموتوا ع القهوة. كل يوم الصبح بشربوا قهوة.</p> <p>كل البسس بالعالم بشربوا قهوة. صح ولا غلط؟</p>
<p>عندي سلاحف كثير غريبين. بمشوا كثير بسرعة، حتى بركضوا. إشي غريب عجيب، لإنه السلاحفة عادة بتكون كثير بطيئة.</p> <p>السلاحف سريعين. صح ولا غلط؟</p>	<p>عندي سلاحف كثير غريبين. بمشوا كثير بسرعة، حتى بركضوا. إشي غريب عجيب، لإنه السلاحفة عادة بتكون كثير بطيئة.</p> <p>السلاحف بطيئين. صح ولا غلط؟</p>	<p>عندي سلاحف كثير غريبين. بمشوا كثير بسرعة، حتى بركضوا. إشي غريب عجيب، لإنه السلاحفة عادة بتكون كثير بطيئة.</p> <p>هدول السلاحف بطيئين. صح ولا غلط؟</p>	<p>عندي سلاحف كثير غريبين. بمشوا كثير بسرعة، حتى بركضوا. إشي غريب عجيب، لإنه السلاحفة عادة بتكون كثير بطيئة.</p> <p>كل السلاحف بالعالم سريعين. صح ولا غلط؟</p>
<p>مبارح قرأت قصة عن أربع دبية كثير غريبين. الدب إجمالاً حيوان مخيف كثير، بس هدولا لأ، بالعكس كثير لطفًا وبحبوا الناس. إشي عن جد غريب، بس حلو.</p> <p>الدبية لطفًا. صح ولا غلط؟</p>	<p>مبارح قرأت قصة عن أربع دبية كثير غريبين. الدب إجمالاً حيوان مخيف كثير، بس هدولا لأ، بالعكس كثير لطفًا وبحبوا الناس. إشي عن جد غريب، بس حلو.</p> <p>الدبية مخيفين. صح ولا غلط؟</p>	<p>مبارح قرأت قصة عن أربع دبية كثير غريبين. الدب إجمالاً حيوان مخيف كثير، بس هدولا لأ، بالعكس كثير لطفًا وبحبوا الناس. إشي عن جد غريب، بس حلو.</p> <p>هدول الدبية مخيفين. صح ولا غلط؟</p>	<p>مبارح قرأت قصة عن أربع دبية كثير غريبين. الدب إجمالاً حيوان مخيف كثير، بس هدولا لأ، بالعكس كثير لطفًا وبحبوا الناس. إشي عن جد غريب، بس حلو.</p> <p>كل الدبية بالعالم لطفًا. صح ولا غلط؟</p>
<p>مبارح حضرت فيلم عن أربع ضفادع غير عن كل الضفادع. إجمالاً الضفدع بنط، بس هدولا لأ. بدال ما ينطوا بمشوا. إشي غريب كثير.</p> <p>الضفادع بمشوا. صح ولا غلط؟</p>	<p>مبارح حضرت فيلم عن أربع ضفادع غير عن كل الضفادع. إجمالاً الضفدع بنط، بس هدولا لأ. بدال ما ينطوا بمشوا. إشي غريب كثير.</p> <p>الضفادع بنطوا. صح ولا غلط؟</p>	<p>مبارح حضرت فيلم عن أربع ضفادع غير عن كل الضفادع. إجمالاً الضفدع بنط، بس هدولا لأ. بدال ما ينطوا بمشوا. إشي غريب كثير.</p> <p>هدول الضفادع بنطوا. صح ولا غلط؟</p>	<p>مبارح حضرت فيلم عن أربع ضفادع غير عن كل الضفادع. إجمالاً الضفدع بنط، بس هدولا لأ. بدال ما ينطوا بمشوا. إشي غريب كثير.</p> <p>كل الضفادع بالعالم بمشوا. صح ولا غلط؟</p>

<p>جاري عنده ثلاث كلاب غير عن كل الكلاب. الكل يعرف إنه الكلب إله ديل، بس هدولا لأ. شكلهم كتير غريب بدون ديل.</p> <p>الكلاب ما إلهمش ديل. صح ولا غلط؟</p>	<p>جاري عنده ثلاث كلاب غير عن كل الكلاب. الكل يعرف إنه الكلب إله ديل، بس هدولا لأ. شكلهم كتير غريب بدون ديل.</p> <p>الكلاب إلهمش ديل. صح ولا غلط؟</p>	<p>جاري عنده ثلاث كلاب غير عن كل الكلاب. الكل يعرف إنه الكلب إله ديل، بس هدولا لأ. شكلهم كتير غريب بدون ديل.</p> <p>هدول الكلاب إلهمش ديل. صح ولا غلط؟</p>	<p>جاري عنده ثلاث كلاب غير عن كل الكلاب. الكل يعرف إنه الكلب إله ديل، بس هدولا لأ. شكلهم كتير غريب بدون ديل.</p> <p>كل الكلاب بالعالم ما إلهمش ديل. صح ولا غلط؟</p>
<p>مبارح قرأت بالجريدة عن أربع فيران غربيين عجيبين. الفار إجمالاً بحبّ الجبنة، بس هدولا لأ. بكر هوا الجبنة وبوكلوهاش.</p> <p>الفيران بوكلوش جبنة. صح ولا غلط؟</p>	<p>مبارح قرأت بالجريدة عن أربع فيران غربيين عجيبين. الفار إجمالاً بحبّ الجبنة، بس هدولا لأ. بكر هوا الجبنة وبوكلوهاش.</p> <p>الفيران بوكلوا جبنة. صح ولا غلط؟</p>	<p>مبارح قرأت بالجريدة عن أربع فيران غربيين عجيبين. الفار إجمالاً بحبّ الجبنة، بس هدولا لأ. بكر هوا الجبنة وبوكلوهاش.</p> <p>هدول الفييران بوكلوا جبنة. صح ولا غلط؟</p>	<p>مبارح قرأت بالجريدة عن أربع فيران غربيين عجيبين. الفار إجمالاً بحبّ الجبنة، بس هدولا لأ. بكر هوا الجبنة وبوكلوهاش.</p> <p>كل الفييران بالعالم بوكلوش جبنة. صح ولا غلط؟</p>
<p>عمي عنده مزرعة خرفان. خرفانه بوكلوا حشيش، إلا تلاتة، هدولا مش زي الخرفان العاديين. بكر هوا الحشيش وبقرّ بوش عليه، ولا حدا قادر يعرف ليش.</p> <p>الخرفان بوكلوش حشيش. صح ولا غلط؟</p>	<p>عمي عنده مزرعة خرفان. خرفانه بوكلوا حشيش، إلا تلاتة، هدولا مش زي الخرفان العاديين. بكر هوا الحشيش وبقرّ بوش عليه، ولا حدا قادر يعرف ليش.</p> <p>الخرفان بوكلوا حشيش. صح ولا غلط؟</p>	<p>عمي عنده مزرعة خرفان. خرفانه بوكلوا حشيش، إلا تلاتة، هدولا مش زي الخرفان العاديين. بكر هوا الحشيش وبقرّ بوش عليه، ولا حدا قادر يعرف ليش.</p> <p>هدول الخرفان بوكلوا حشيش. صح ولا غلط؟</p>	<p>عمي عنده مزرعة خرفان. خرفانه بوكلوا حشيش، إلا تلاتة، هدولا مش زي الخرفان العاديين. بكر هوا الحشيش وبقرّ بوش عليه، ولا حدا قادر يعرف ليش.</p> <p>كل الخرفان بالعالم بوكلوش حشيش. صح ولا غلط؟</p>

#### ARABIC – VERBAL ASPECT

PSP (true)	PPP (true)	PPD (false)	PPN (false)
<p>أنا وسامي قاعدين نتسلّي بدّق شطرنج. تفاجأت لما سامي قبل يلعب، لأنه ما إلوش بالعادة يلعب شطرنج، ودايماً بقول إنه بكره هاللعبة.</p> <p>سامي يلعب شطرنج. صح ولا غلط؟</p>	<p>أنا وسامي قاعدين نتسلّي بدّق شطرنج. تفاجأت لما سامي قبل يلعب، لأنه ما إلوش بالعادة يلعب شطرنج، ودايماً بقول إنه بكره هاللعبة.</p> <p>سامي عم يلعب شطرنج. صح ولا غلط؟</p>	<p>أنا وسامي قاعدين نتسلّي بدّق شطرنج. تفاجأت لما سامي قبل يلعب، لأنه ما إلوش بالعادة يلعب شطرنج، ودايماً بقول إنه بكره هاللعبة.</p> <p>سامي عم يلعب كرة قدم. صح ولا غلط؟</p>	<p>أنا وسامي قاعدين نتسلّي بدّق شطرنج. تفاجأت لما سامي قبل يلعب، لأنه ما إلوش بالعادة يلعب شطرنج، ودايماً بقول إنه بكره هاللعبة.</p> <p>سامي مش عم يلعب شطرنج. صح ولا غلط؟</p>

<p>أنا وبسمة هلاً بحفلة فيها رقص. بسمة ما إلهاش بالعادة ترقص ودايمًا بتضلها قاعدة لما في رقص، بس اليوم أجا ع بالها تجرّب إشي جديد، وهيها هلاً نازلة رقص، ما تقول إلا رقاصة.</p> <p>بسمة بترقص. صح ولا غلط؟</p>	<p>أنا وبسمة هلاً بحفلة فيها رقص. بسمة ما إلهاش بالعادة ترقص ودايمًا بتضلها قاعدة لما في رقص، بس اليوم أجا ع بالها تجرّب إشي جديد، وهيها هلاً نازلة رقص، ما تقول إلا رقاصة.</p> <p>بسمة عم بترقص. صح ولا غلط؟</p>	<p>أنا وبسمة هلاً بحفلة فيها رقص. بسمة ما إلهاش بالعادة ترقص ودايمًا بتضلها قاعدة لما في رقص، بس اليوم أجا ع بالها تجرّب إشي جديد، وهيها هلاً نازلة رقص، ما تقول إلا رقاصة.</p> <p>بسمة عم بتزرع قرع. صح ولا غلط؟</p>	<p>أنا وبسمة هلاً بحفلة فيها رقص. بسمة ما إلهاش بالعادة ترقص ودايمًا بتضلها قاعدة لما في رقص، بس اليوم أجا ع بالها تجرّب إشي جديد، وهيها هلاً نازلة رقص، ما تقول إلا رقاصة.</p> <p>بسمة مش عم بترقص. صح ولا غلط؟</p>
<p>عندي صاحب إسمه عامر. عامر هلاً بالمنزه، راح يركض هناك. عمره ما ركض من قبل، هاي أول مرّة. هو عادةً بفضل يسبح، بس اليوم الطقس حلو برة فقال يستغل الفرصة.</p> <p>عامر بركض. صح ولا غلط؟</p>	<p>عندي صاحب إسمه عامر. عامر هلاً بالمنزه، راح يركض هناك. عمره ما ركض من قبل، هاي أول مرّة. هو عادةً بفضل يسبح، بس اليوم الطقس حلو برة فقال يستغل الفرصة.</p> <p>عامر عم بركض. صح ولا غلط؟</p>	<p>عندي صاحب إسمه عامر. عامر هلاً بالمنزه، راح يركض هناك. عمره ما ركض من قبل، هاي أول مرّة. هو عادةً بفضل يسبح، بس اليوم الطقس حلو برة فقال يستغل الفرصة.</p> <p>عامر عم بمشي. صح ولا غلط؟</p>	<p>عندي صاحب إسمه عامر. عامر هلاً بالمنزه، راح يركض هناك. عمره ما ركض من قبل، هاي أول مرّة. هو عادةً بفضل يسبح، بس اليوم الطقس حلو برة فقال يستغل الفرصة.</p> <p>عامر مش عم بركض. صح ولا غلط؟</p>
<p>صاحبتي فريدة قاعدة تشتغل على تطريزة. هذا إشي غريب كثير لأنه هي ما إلهاش بالعادة تطرّز وحتى دايمًا بتقول إنه بتعرفش تطرّز. الظاهر حدا علّمها.</p> <p>فريدة بتطرّز. صح ولا غلط؟</p>	<p>صاحبتي فريدة قاعدة تشتغل على تطريزة. هذا إشي غريب كثير لأنه هي ما إلهاش بالعادة تطرّز وحتى دايمًا بتقول إنه بتعرفش تطرّز. الظاهر حدا علّمها.</p> <p>فريدة عم بتطرّز. صح ولا غلط؟</p>	<p>صاحبتي فريدة قاعدة تشتغل على تطريزة. هذا إشي غريب كثير لأنه هي ما إلهاش بالعادة تطرّز وحتى دايمًا بتقول إنه بتعرفش تطرّز. الظاهر حدا علّمها.</p> <p>فريدة عم بتطبخ معكرونة. صح ولا غلط؟</p>	<p>صاحبتي فريدة قاعدة تشتغل على تطريزة. هذا إشي غريب كثير لأنه هي ما إلهاش بالعادة تطرّز وحتى دايمًا بتقول إنه بتعرفش تطرّز. الظاهر حدا علّمها.</p> <p>فريدة مش عم بتطرّز. صح ولا غلط؟</p>
<p>أنا ولؤي بدرس رسم قاعدين نشتغل كل واحد على صورة. عمرنا ما رسمنا من قبل، هاي أول مرّة. قبل ما نسجل لهذا الدرس ما كنّاش نعرف إشي بالفن.</p> <p>لؤي برسم. صح ولا غلط؟</p>	<p>أنا ولؤي بدرس رسم قاعدين نشتغل كل واحد على صورة. عمرنا ما رسمنا من قبل، هاي أول مرّة. قبل ما نسجل لهذا الدرس ما كنّاش نعرف إشي بالفن.</p> <p>لؤي عم برسم. صح ولا غلط؟</p>	<p>أنا ولؤي بدرس رسم قاعدين نشتغل كل واحد على صورة. عمرنا ما رسمنا من قبل، هاي أول مرّة. قبل ما نسجل لهذا الدرس ما كنّاش نعرف إشي بالفن.</p> <p>لؤي عم بكتب مكتوب. صح ولا غلط؟</p>	<p>أنا ولؤي بدرس رسم قاعدين نشتغل كل واحد على صورة. عمرنا ما رسمنا من قبل، هاي أول مرّة. قبل ما نسجل لهذا الدرس ما كنّاش نعرف إشي بالفن.</p> <p>لؤي مش عم برسم. صح ولا غلط؟</p>

<p>أختي جميلة عادةً بتعملش إلا مجدرة وبتحشّ تطبخ أي إشي ثاني. بس اليوم جايين عندها ضيوف ع الغدا وبحبّوش المجدرة، فأنجبرت تطبخ إشي ثاني. هي هالأ بالمطبخ قاعدة تعمل ملوخية.</p> <p>جميلة بتطبخ ملوخية. صح ولا غلط؟</p>	<p>أختي جميلة عادةً بتعملش إلا مجدرة وبتحشّ تطبخ أي إشي ثاني. بس اليوم جايين عندها ضيوف ع الغدا وبحبّوش المجدرة، فأنجبرت تطبخ إشي ثاني. هي هالأ بالمطبخ قاعدة تعمل ملوخية.</p> <p>جميلة عم بتطبخ ملوخية. صح ولا غلط؟</p>	<p>أختي جميلة عادةً بتعملش إلا مجدرة وبتحشّ تطبخ أي إشي ثاني. بس اليوم جايين عندها ضيوف ع الغدا وبحبّوش المجدرة، فأنجبرت تطبخ إشي ثاني. هي هالأ بالمطبخ قاعدة تعمل ملوخية.</p> <p>جميلة عم بنتنزّه. صح ولا غلط؟</p>	<p>أختي جميلة عادةً بتعملش إلا مجدرة وبتحشّ تطبخ أي إشي ثاني. بس اليوم جايين عندها ضيوف ع الغدا وبحبّوش المجدرة، فأنجبرت تطبخ إشي ثاني. هي هالأ بالمطبخ قاعدة تعمل ملوخية.</p> <p>جميلة مش عم بتطبخ ملوخية. صح ولا غلط؟</p>
<p>أنا وصحابي هالأ قاعدين مع بعض وصحابي ثائر قاعد يطربنا بأغنية سمعها جديد. أنا كتير متفاجئ لأنه قبل اليوم عمره ما غنى ودايمًا بقول إنه بعرفش يغني.</p> <p>ثائر عم يغني. صح ولا غلط؟</p>	<p>أنا وصحابي هالأ قاعدين مع بعض وصحابي ثائر قاعد يطربنا بأغنية سمعها جديد. أنا كتير متفاجئ لأنه قبل اليوم عمره ما غنى ودايمًا بقول إنه بعرفش يغني.</p> <p>ثائر عم يغني. صح ولا غلط؟</p>	<p>أنا وصحابي هالأ قاعدين مع بعض وصحابي ثائر قاعد يطربنا بأغنية سمعها جديد. أنا كتير متفاجئ لأنه قبل اليوم عمره ما غنى ودايمًا بقول إنه بعرفش يغني.</p> <p>ثائر عم بزرع فجل. صح ولا غلط؟</p>	<p>أنا وصحابي هالأ قاعدين مع بعض وصحابي ثائر قاعد يطربنا بأغنية سمعها جديد. أنا كتير متفاجئ لأنه قبل اليوم عمره ما غنى ودايمًا بقول إنه بعرفش يغني.</p> <p>ثائر مش عم يغني. صح ولا غلط؟</p>
<p>صاحبتي رغبة قاعدة تدرز قمصان بالصالون. هي ما إلهاش بالعادة تخيط لإنها بتخاف من الأبر، بس اليوم مجبورة لإنه هالقمصان بدهم خياطة وولادها لازم يلبسوهم بكرة.</p> <p>رغبة بتخيط قمصان. صح ولا غلط؟</p>	<p>صاحبتي رغبة قاعدة تدرز قمصان بالصالون. هي ما إلهاش بالعادة تخيط لإنها بتخاف من الأبر، بس اليوم مجبورة لإنه هالقمصان بدهم خياطة وولادها لازم يلبسوهم بكرة.</p> <p>رغبة عم بتخيط قمصان. صح ولا غلط؟</p>	<p>صاحبتي رغبة قاعدة تدرز قمصان بالصالون. هي ما إلهاش بالعادة تخيط لإنها بتخاف من الأبر، بس اليوم مجبورة لإنه هالقمصان بدهم خياطة وولادها لازم يلبسوهم بكرة.</p> <p>رغبة عم بتخيط بلايز. صح ولا غلط؟</p>	<p>صاحبتي رغبة قاعدة تدرز قمصان بالصالون. هي ما إلهاش بالعادة تخيط لإنها بتخاف من الأبر، بس اليوم مجبورة لإنه هالقمصان بدهم خياطة وولادها لازم يلبسوهم بكرة.</p> <p>رغبة مش عم بتخيط قمصان. صح ولا غلط؟</p>
<p>أنا وسامح بالنادي الرياضي. سامح بلّش رفع أثقال قبل ربع ساعة وبعده مش مخلص. عمره ما رفع أثقال من قبل، هاي أول مرّة. قبل كان ما يسترجيش لإنه ما كانش عنده عضلات كتير. بس هالأ صار أقوى.</p> <p>سامح برفع أثقال. صح ولا غلط؟</p>	<p>أنا وسامح بالنادي الرياضي. سامح بلّش رفع أثقال قبل ربع ساعة وبعده مش مخلص. عمره ما رفع أثقال من قبل، هاي أول مرّة. قبل كان ما يسترجيش لإنه ما كانش عنده عضلات كتير. بس هالأ صار أقوى.</p> <p>سامح عم برفع أثقال. صح ولا غلط؟</p>	<p>أنا وسامح بالنادي الرياضي. سامح بلّش رفع أثقال قبل ربع ساعة وبعده مش مخلص. عمره ما رفع أثقال من قبل، هاي أول مرّة. قبل كان ما يسترجيش لإنه ما كانش عنده عضلات كتير. بس هالأ صار أقوى.</p> <p>سامح عم بنطّ حبله. صح ولا غلط؟</p>	<p>أنا وسامح بالنادي الرياضي. سامح بلّش رفع أثقال قبل ربع ساعة وبعده مش مخلص. عمره ما رفع أثقال من قبل، هاي أول مرّة. قبل كان ما يسترجيش لإنه ما كانش عنده عضلات كتير. بس هالأ صار أقوى.</p> <p>سامح مش عم برفع أثقال. صح ولا غلط؟</p>

<p>أنا هلاً عند سوسن، وهي قاعدة تضبّ الصالون. المزبوط ما إلهاش بالعادة ترتّب إشي، بس اليوم مجبورة لأنه جاييها ضيوف.</p> <p>سوسن مش عم بترتّب الصالون. صح ولا غلط؟</p>	<p>أنا هلاً عند سوسن، وهي قاعدة تضبّ الصالون. المزبوط ما إلهاش بالعادة ترتّب إشي، بس اليوم مجبورة لأنه جاييها ضيوف.</p> <p>سوسن عم بترتّب الصالون. صح ولا غلط؟</p>	<p>أنا هلاً عند سوسن، وهي قاعدة تضبّ الصالون. المزبوط ما إلهاش بالعادة ترتّب إشي، بس اليوم مجبورة لأنه جاييها ضيوف.</p> <p>سوسن عم بترتّب غرفة النوم. صح ولا غلط؟</p>	<p>أنا هلاً عند سوسن، وهي قاعدة تضبّ الصالون. المزبوط ما إلهاش بالعادة ترتّب إشي، بس اليوم مجبورة لأنه جاييها ضيوف.</p> <p>سوسن مش عم بترتّب الصالون. صح ولا غلط؟</p>
<p>صاحبي سليم هلاً بطبريا، طلع يتصيّد سمك هناك. عمره ما تصيّد سمك من قبل، هاي أول مرّة. وين هو ساكن فش محل بقدر يتصيّد فيه.</p> <p>سليم بتصيّد سمك. صح ولا غلط؟</p>	<p>صاحبي سليم هلاً بطبريا، طلع يتصيّد سمك هناك. عمره ما تصيّد سمك من قبل، هاي أول مرّة. وين هو ساكن فش محل بقدر يتصيّد فيه.</p> <p>سليم عم بتصيّد سمك. صح ولا غلط؟</p>	<p>صاحبي سليم هلاً بطبريا، طلع يتصيّد سمك هناك. عمره ما تصيّد سمك من قبل، هاي أول مرّة. وين هو ساكن فش محل بقدر يتصيّد فيه.</p> <p>سليم عم بتصيّد عسافير. صح ولا غلط؟</p>	<p>صاحبي سليم هلاً بطبريا، طلع يتصيّد سمك هناك. عمره ما تصيّد سمك من قبل، هاي أول مرّة. وين هو ساكن فش محل بقدر يتصيّد فيه.</p> <p>سليم مش عم بتصيّد سمك. صح ولا غلط؟</p>
<p>عبير بتخاف من الميّ وعمرها ما قبلت تسبح. بس اليوم أقنعناها وهلاّ هي بالبركة الغميقة، رايحة جاي كأنها طول عمرها سبيحة.</p> <p>عبير بتسبح. صح ولا غلط؟</p>	<p>عبير بتخاف من الميّ وعمرها ما قبلت تسبح. بس اليوم أقنعناها وهلاّ هي بالبركة الغميقة، رايحة جاي كأنها طول عمرها سبيحة.</p> <p>عبير عم بتسبح. صح ولا غلط؟</p>	<p>عبير بتخاف من الميّ وعمرها ما قبلت تسبح. بس اليوم أقنعناها وهلاّ هي بالبركة الغميقة، رايحة جاي كأنها طول عمرها سبيحة.</p> <p>عبير عم بتطبخ شوربة. صح ولا غلط؟</p>	<p>عبير بتخاف من الميّ وعمرها ما قبلت تسبح. بس اليوم أقنعناها وهلاّ هي بالبركة الغميقة، رايحة جاي كأنها طول عمرها سبيحة.</p> <p>عبير مش عم بتسبح. صح ولا غلط؟</p>

## APPENDIX E: GRAMMATICALITY JUDGMENT TASKS (GJTS)

*Below, items in plain text were included in List 1, and items in italics were included in List 2. Each row indicates a token set. Conditions are abbreviated using the three-character abbreviations used elsewhere in this dissertation.*

### ENGLISH – INSTRUCTIONS

In this section, you will be given a series of **English** sentences, and you will be asked to determine how natural they sound to you by ranking them on a scale of 1 to 6, as follows:

1	completely unnatural
2	almost completely unnatural
3	mostly unnatural
4	mostly natural
5	almost perfectly natural
6	perfectly natural

You can read and/or listen to each sentence as many times as you'd like before making your choice. Click NEXT to move from sentence to sentence.

في هذا القسم، سترى مجموعة من الجمل **الإنجليزية**، والمطلوب منك أن تحدد مدى طبيعية كل جملة برأيك وذلك بتحديد رقم بين الواحد والستة، كما يلي:

1	بمنتهى الركافة
2	ركيفة إلى ما يقارب أقصى حد
3	ركيفة إلى حد بعيد
4	طبيعية إلى حد بعيد
5	طبيعية إلى ما يقارب أقصى حد
6	بمنتهى الطبيعية

بإمكانك قراءة كل جملة أو السماع إليها أو الاثنين أي عدد من المرات قبل أن تختار الإجابة. اضغط على NEXT للانتقال من جملة إلى أخرى.

### ENGLISH – RESUMPTIVE PRONOUNS

GAP (grammatical)	RES (ungrammatical)
Nancy used the medicine that the expert invented.	<i>Nancy used the medicine that the expert invented it.</i>

<i>Ellen booked the venue that her mother liked.</i>	Ellen booked the venue that her mother liked it.
My mother disliked the music that I enjoyed.	<i>My mother disliked the music that I enjoyed it.</i>
<i>Rachel cooked the chicken that her husband bought.</i>	Rachel cooked the chicken that her husband bought it.
Travis hated the tea that his sister made.	<i>Travis hated the tea that his sister made it.</i>
<i>Matthew read the book that his mother wrote.</i>	Matthew read the book that his mother wrote it.
Sam watched the movies that his father recommended.	<i>Sam watched the movies that his father recommended them.</i>
<i>Brenda studied the crimes that Paul committed.</i>	Brenda studied the crimes that Paul committed them.
Laura fixed the bikes that Billy broke.	<i>Laura fixed the bikes that Billy broke them.</i>
<i>The president rejected the proposals that the senator made.</i>	The president rejected the proposals that the senator made them.
Patty liked the rooms that Marilyn designed.	<i>Patty liked the rooms that Marilyn designed them.</i>
<i>The teacher graded the exams that Dana took.</i>	The teacher graded the exams that Dana took them.

#### ENGLISH – DOUBLE OBJECTS

<b>BTH</b> <b>(grammatical)</b>	<b>ENG</b> <b>(grammatical)</b>	<b>NTR</b> <b>(ungrammatical)</b>	<b>NNS</b> <b>(ungrammatical)</b>
Julie fed Parker the apple.	Julie threw Parker the apple.	<i>Julie displayed Parker the apple.</i>	<i>Julie slept Parker the apple.</i>
<i>Nancy loaned Adam the money.</i>	<i>Nancy paid Adam the money.</i>	Nancy mentioned Adam the money.	Nancy joked Adam the money.
Peter sold Henry the pasta.	Peter cooked Henry the pasta.	<i>Peter suggested Henry the pasta.</i>	<i>Peter stood Henry the pasta.</i>
<i>Jeremiah asked Theresa the question.</i>	<i>Jeremiah read Theresa the question.</i>	Jeremiah repeated Theresa the question.	Jeremiah fell Theresa the question.
Sally showed Mark the results.	Sally told Mark the results.	<i>Sally announced Mark the results.</i>	<i>Sally came Mark the results.</i>



<i>Roger handed Joe the recipe.</i>	<i>Roger brought Joe the recipe.</i>	Roger explained Joe the recipe.	Roger sat Joe the recipe.
<i>Lisa fed Michael the orange.</i>	<i>Lisa threw Michael the orange.</i>	Lisa displayed Michael the orange.	Lisa slept Michael the orange.
Tricia loaned Phillip the funds.	Tricia paid Phillip the funds.	<i>Tricia mentioned Phillip the funds.</i>	<i>Tricia joked Phillip the funds.</i>
<i>Neil sold Betty the soup.</i>	<i>Neil cooked Betty the soup.</i>	Neil suggested Betty the soup.	Neil stood Betty the soup.
Becky asked Samuel the same thing.	Becky read Samuel the same thing.	<i>Becky repeated Samuel the same thing.</i>	<i>Becky fell Samuel the same thing.</i>
<i>Samantha showed Jessica the answer.</i>	<i>Samantha told Jessica the answer.</i>	Samantha announced Jessica the answer.	Samantha came Jessica the answer.
Frank handed Sally the instructions.	Frank brought Sally the instructions.	<i>Frank explained Sally the instructions.</i>	<i>Frank sat Sally the instructions.</i>

## ENGLISH – ADVERB WORD ORDER

Conditions whose abbreviations end in G are grammatical; conditions whose abbreviations end in U are ungrammatical.

<b>P1G</b>	<b>P2G</b>	<b>P4G</b>	<b>P1U</b>	<b>P2U</b>	<b>P3U</b>
Sometimes John mows the lawn.	John always mows the lawn.	John mows the lawn every day.	<i>Always John mows the lawn.</i>	<i>John every day mows the lawn.</i>	<i>John mows sometimes the lawn.</i>
<i>Usually Kevin reads the newspaper.</i>	<i>Kevin never reads the newspaper.</i>	<i>Kevin reads the newspaper every week.</i>	Never Kevin reads the newspaper.	Kevin every week reads the newspaper.	Kevin reads usually the newspaper.
<i>Sometimes Nathan wears a tie.</i>	<i>Nathan always wears a tie.</i>	<i>Nathan wears a tie every day.</i>	Always Nathan wears a tie.	Nathan every day wears a tie.	Nathan wears sometimes a tie.
Usually Dennis forgets his umbrella.	Dennis never forgets his umbrella.	Dennis forgets his umbrella every week.	<i>Never Dennis forgets his umbrella.</i>	<i>Dennis every week forgets his umbrella.</i>	<i>Dennis forgets usually his umbrella.</i>
Sometimes Sarah eats cake.	Sarah always eats cake.	Sarah eats cake every day.	<i>Always Sarah eats cake.</i>	<i>Sarah every day eats cake.</i>	<i>Sarah eats sometimes cake.</i>

<i>Usually Julie bakes cookies.</i>	<i>Julie never bakes cookies.</i>	<i>Julie bakes cookies every week.</i>	<i>Never Julie bakes cookies.</i>	<i>Julie every week bakes cookies.</i>	<i>Julie bakes usually cookies.</i>
<i>Sometimes Vanessa plays tennis.</i>	<i>Vanessa always plays tennis.</i>	<i>Vanessa plays tennis every day.</i>	<i>Always Vanessa plays tennis.</i>	<i>Vanessa every day plays tennis.</i>	<i>Vanessa plays sometimes tennis.</i>
<i>Usually George coaches basketball.</i>	<i>George never coaches basketball.</i>	<i>George coaches basketball every week.</i>	<i>Never George coaches basketball.</i>	<i>George every week coaches basketball.</i>	<i>George coaches usually basketball.</i>
<i>Sometimes Irene irons her shirts.</i>	<i>Irene always irons her shirts.</i>	<i>Irene irons her shirts every day.</i>	<i>Always Irene irons her shirts.</i>	<i>Irene every day irons her shirts.</i>	<i>Irene irons sometimes her shirts.</i>
<i>Usually Patrick makes a mess.</i>	<i>Patrick never makes a mess.</i>	<i>Patrick makes a mess every week.</i>	<i>Never Patrick makes a mess.</i>	<i>Patrick every week makes a mess.</i>	<i>Patrick makes usually a mess.</i>
<i>Sometimes Barbara cleans her house.</i>	<i>Barbara always cleans her house.</i>	<i>Barbara cleans her house every day.</i>	<i>Always Barbara cleans her house.</i>	<i>Barbara every day cleans her house.</i>	<i>Barbara cleans sometimes her house.</i>
<i>Usually Ian cooks pasta.</i>	<i>Ian never cooks pasta.</i>	<i>Ian cooks pasta every week.</i>	<i>Never Ian cooks pasta.</i>	<i>Ian every week cooks pasta.</i>	<i>Ian cooks usually pasta.</i>

## ARABIC – INSTRUCTIONS

In this section, you will be given a series of **Palestinian Arabic** sentences, and you will be asked to determine how natural they sound to you by ranking them on a scale of 1 to 6, as follows:

1	completely unnatural
2	almost completely unnatural
3	mostly unnatural
4	mostly natural
5	almost perfectly natural
6	perfectly natural

You can read and/or listen to each sentence as many times as you'd like before making your choice. Click NEXT to move from sentence to sentence.

في هذا القسم، ستري مجموعة من الجمل **بالعربية العامية الفلسطينية**، والمطلوب منك أن تحدد مدى طبيعية كل جملة برأيك وذلك بتحديد رقم بين الواحد والستة، كما يلي:

1	بمنتهى الركاقة
2	ركيكة إلى ما يقارب أقصى حد
3	ركيكة إلى حد بعيد
4	طبيعية إلى حد بعيد
5	طبيعية إلى ما يقارب أقصى حد
6	بمنتهى الطبيعية

بإمكانك قراءة كل جملة أو السماع إليها أو الاثنين أي عدد من المرات قبل أن تختار الإجابة. اضغط على NEXT للانتقال من جملة إلى أخرى.

#### ARABIC – RESUMPTIVE PRONOUNS

RES (grammatical)	GAP (ungrammatical)
زاهي شرب الشاي اللي أمه عملته.	زاهي شرب الشاي اللي أمه عملت .
روان قلت السمك اللي جوزها صاده .	روان قلت السمك اللي جوزها صاد.
شكري رمى الراديو اللي رامي خربّه.	شكري رمى الراديو اللي رامي خرب .
المطربة غنّت الأغنية اللي الجمهور طلبها .	المطربة غنّت الأغنية اللي الجمهور طلب.
سوسن أكلت الشورية اللي منيرة طبختها.	سوسن أكلت الشورية اللي منيرة طبخت .
الولد كسر المزهرية اللي إمه اشترتها .	الولد كسر المزهرية اللي إمه اشترت.
كريم قرأ الكتب اللي فايضة ألفتهم.	كريم قرأ الكتب اللي فايضة ألفت .
المعلمة صلّحت الامتحانات اللي عصام قدّمهم.	المعلمة صلّحت الامتحانات اللي عصام قدّم.
الرئيس دعم المشاريع اللي الوزير اقترحهم.	الرئيس دعم المشاريع اللي الوزير اقترح .
الجارّة حضرت البرامج اللي أختها حبّتهم.	الجارّة حضرت البرامج اللي أختها حبّت.
غادة شافت المكاتيب اللي نهى كتبّتهم.	غادة شافت المكاتيب اللي نهى كتبت .
عبير جلت الصحون اللي الولد استعملهم.	عبير جلت الصحون اللي الولد استعمل.

#### ARABIC – DOUBLE OBJECTS

BTH (grammatical)	CAU (grammatical)	ENG (ungrammatical)	NTR (ungrammatical)
مروى طعّمت لبنى التفاحة.	مروى شمّمت لبنى التفاحة.	مروى رمت لبنى التفاحة .	مروى عرّضت لبنى التفاحة .

غادة ذُكِّرَتْ مراد المصاري.	غادة دَفَعَتْ مراد المصاري.	غادة دَفَعَتْ مراد المصاري.	غادة ذُكِّرَتْ مراد المصاري.
نبيلة اقترحت باسل المعكرونة.	نبيلة دَوَّقَتْ باسل المعكرونة.	نبيلة طَبَّخَتْ باسل المعكرونة.	نبيلة باعت باسل المعكرونة.
فهد عاد نائل السؤال.	فهد سَمَّعَ نائل السؤال.	فهد قَرَأَ نائل السؤال.	فهد سَأَلَ نائل السؤال.
نائلة أُعلنت شروق النتائج.	نائلة فَهَّمَتْ شروق النتائج.	نائلة قَالَتْ شروق النتائج.	نائلة وَرَجَتْ شروق النتائج.
هالة شَرَحَتْ علاء الوصفة.	هالة كَتَبَتْ علاء الوصفة.	هالة جَابَتْ علاء الوصفة.	هالة ناولت علاء الوصفة.
تغريد عَرَضَتْ وافي الموزة.	تغريد سَمَّمت وافي الموزة.	تغريد رمت وافي الموزة.	تغريد طَعَمَتْ وافي الموزة.
ريم ذُكِّرَتْ كريم المبلغ.	ريم دَفَعَتْ كريم المبلغ.	ريم دَفَعَتْ كريم المبلغ.	ريم ذَيَّنَتْ كريم المبلغ.
أمانى اقترحت أميرة الشورية.	أمانى دَوَّقَتْ أميرة الشورية.	أمانى طَبَّخَتْ أميرة الشورية.	أمانى باعت أميرة الشورية.
رعدة عادت حسام نفس الإشي.	رعدة سَمَّعت حسام نفس الإشي.	رعدة قَرَأَتْ حسام نفس الإشي.	رعدة سَأَلَتْ حسام نفس الإشي.
فاروق أعلن شكران الجواب.	فاروق فَهَّمْ شكران الجواب.	فاروق قال شكران الجواب.	فاروق وَرَجى شكران الجواب.
نزار شَرَحَ فؤاد التعليمات.	نزار كَتَبَ فؤاد التعليمات.	نزار جاب فؤاد التعليمات.	نزار ناول فؤاد التعليمات.

## ARABIC – ADVERB WORD ORDER

Conditions whose abbreviations end in G are grammatical; conditions whose abbreviations end in U are ungrammatical.

P1G	P2G	P3G	P3U	S4U	V4U
سارة بتوكل كيس.	سارة كل يوم بتوكل كيس.	سارة بتوكل مرّات كيس.	سارة بتوكل ولا مرّة كيس.	سارة بتوكل كيس ولا عمرها.	بتوكل سارة كيس ولا مرّة.
سلمي بتخبز ولا مرّة سلمى بتخبز بسكوت.	سلمي كل أسبوع بتخبز بسكوت.	سلمي بتخبز عادةً بسكوت.	سلمي بتخبز ولا عمرها بسكوت.	سلمي بتخبز بسكوت ولا مرّة.	بتخبز سلمى بسكوت ولا عمرها.
علي بلعب ولا مرّة تيس.	علي كل يوم بلعب تيس.	علي بلعب مرّات تيس.	علي بلعب ولا مرّة تيس.	علي بلعب تيس ولا عمره.	بلعب علي تيس ولا مرّة.
موسى بدرب ولا مرّة سلة.	موسى كل أسبوع بدرب كرة سلة.	موسى بدرب عادةً كرة سلة.	موسى بدرب ولا عمره كرة سلة.	موسى بدرب كرة سلة ولا مرّة.	بدرب موسى كرة سلة ولا عمره.
كريم بنظف ولا مرّة بيته.	كريم كل يوم بنظف بيته.	كريم بنظف مرّات بيته.	كريم بنظف ولا مرّة بيته.	كريم بنظف بيته ولا عمره.	بنظف كريم بيته ولا مرّة.
رانية بدخن ولا مرّة سيغارة.	رانية كل أسبوع بدخن سيغارة.	رانية بدخن عادةً سيغارة.	رانية بدخن ولا عمرها سيغارة.	رانية بدخن سيغارة ولا مرّة.	بدخن رانية سيغارة ولا عمرها.

بكوي فهمي قمصانه ولا مرّة.	فهمي بكوي قمصانه ولا عمره.	فهمي بكوي مرّات قمصانه.	فهمي بكوي ولا مرّة قمصانه.	فهمي بكوي قمصانه ولا عمره.	بكوي فهمي قمصانه ولا مرّة.
بعمل عماد فوضى ولا عمره.	عماد بعمل فوضى ولا مرّة.	عماد بعمل عادةً فوضى.	عماد بعمل ولا عمره فوضى.	عماد بعمل فوضى ولا مرّة.	بعمل عماد فوضى ولا عمره.
بتركب لميس الباص ولا مرّة.	لميس بتركب الباص ولا عمرها.	لميس بتركب مرّات الباص.	لميس بتركب ولا مرّة الباص.	لميس بتركب الباص ولا عمرها.	بتركب لميس الباص ولا مرّة.
بطبخ رمزي معكرونة ولا عمره.	رمزي بطبخ معكرونة ولا مرّة.	رمزي بطبخ عادةً معكرونة.	رمزي بطبخ ولا عمره معكرونة.	رمزي بطبخ معكرونة ولا مرّة.	بطبخ رمزي معكرونة ولا عمره.
بغَيّر سامي الملاحف ولا مرّة.	سامي بغَيّر الملاحف ولا عمره.	سامي بغَيّر مرّات الملاحف.	سامي بغَيّر ولا مرّة الملاحف.	سامي بغَيّر الملاحف ولا عمره.	بغَيّر سامي الملاحف ولا مرّة.
بغسل بهاء بسكليتّه ولا عمره.	بهاء بغسل بسكليتّه ولا مرّة.	بهاء بغسل عادةً بسكليتّه.	بهاء بغسل ولا عمره بسكليتّه.	بهاء بغسل بسكليتّه ولا مرّة.	بغسل بهاء بسكليتّه ولا عمره.

## APPENDIX F: EXPERIMENT GUIDELINES

# EXPERIMENT GUIDELINES

Thank you so much for agreeing to participate in the experiment! Please read the guidelines below before you begin. They will help you feel more comfortable with the experiment and what you need to do. Much of this information is also included in the instructions. If you have any questions about anything included here, please send an e-mail to [e-mail address redacted] to ask your questions before you begin! This document also includes the experiment links at the end.

Good luck!

### Summary of Experiment

- This experiment consists of five parts:
  - **Part 1** is language-neutral; it does not focus on either Arabic or English. It consists of a consent form, a questionnaire, and some tasks in which you learn and are tested on features of an artificial language.
  - **Parts 2 and 3** consist of a series of tasks in which you will give **written** responses. Part 2 focuses on English and Part 3 focuses on Palestinian Arabic.
  - **Parts 4 and 5** consist of a series of tasks in which you will give **oral** responses. Part 4 focuses on English and Part 5 focuses on Palestinian Arabic.
- Parts 2 and 3 are essentially identical to each other, the only difference being the language each focuses on. The same goes for Parts 4 and 5. In each part, the language of focus is indicated in the instructions in **bold red text**.

- *If your participant number begins with **EXSB** or **EXHS**, you will need to complete **all five parts**.*
- *If your participant number begins with **EXAR**, you will **only** need to complete **Parts 1, 3, and 5**.*
- *If your participant number begins with **EXEN**, you will **only** need to complete **Parts 1, 2, and 4**.*

- In the guidelines below, please ignore anything relating to any parts you do not need to complete.

### Important Information

- **All responses are required.** If you do not know or are not sure of an answer, guess or indicate that you do not know, as specified in the instructions (i.e. by saying “I don’t know,” selecting ???, or entering a question mark).
- Please do not use dictionaries or any other references or sources of aid. If you do not understand a word in a question, please answer to the best of your ability based on your own knowledge, or guess if necessary.

- Part 1: In Section 3, the learning portion of each test is timed. The amount of time you have will be indicated in the instructions. **These are the only components of the whole experiment that are timed; everything else is untimed.**
- Parts 3 and 5 are about **Palestinian Arabic** only, not Modern Standard Arabic (*fus7a*). The sentences you will be given and the responses you will be asked to give will **all** be in **Palestinian Arabic**. The only elements of the experiment that are in Modern Standard Arabic (*fus7a*) are the instructions. **Please do not use Modern Standard Arabic (*fus7a*) in your responses!**
- Parts 2-5: Every section, except for Section 1 of Parts 4 and 5, includes a few practice items. These will give you an opportunity to practice answering questions before you start the actual section.
- Parts 2 and 3: All materials will be presented to you **in written form and in oral form.** For Part 3, the written materials are presented in both Arabic script and English characters (transliteration). It is up to you whether you'd like to read, listen, or both, and you can do either as many times as you'd like! You do not have to listen if reading is sufficient for you and listening is only slowing you down. Alternatively, if you would prefer to listen (for example, if you are not comfortable reading Palestinian Arabic in Arabic script and/or transliteration), you do not have to read. You can read and/or listen to any given question as many times as you'd like, and you can alternate between reading, listening, and both throughout the experiment, or you can choose to do the same thing for every question. **It is entirely up to you, and there are no limits or restrictions!**
- Parts 3 and 5: You may write your responses in either Arabic script or English characters (transliteration) or both. You may use either or both for any given question, and you can alternate between Arabic script, English characters, and both throughout the experiment, or you can choose the same format for every question. Again, **it is entirely up to you, and there are no limits or restrictions!**
- All instructions are given in both English and Arabic, English first and then Arabic. You are free to read whichever version you are more comfortable with. The instructions for Parts 2 and 3 are almost identical; the difference is that each indicates a different language of focus, and Part 3 specifies that the written materials include both Arabic script and English characters (transliteration). If you have already read the instructions for Part 2, you may choose to skip or skim the instructions for Part 3. The same applies to Parts 4 and 5.
- Parts 4 and 5: In Section 1, which asks you to tell a story, you will need to say START (in Part 4) and بداية/bidaye (in Part 5) before you begin, and END (in Part 4) and نهاية/nihaye (in Part 5) when you finish.

### Technical Requirements

- You will need
  - a **high-speed** Internet connection
  - functioning **speakers** (for all parts)
  - a functioning **microphone** (for Parts 4 and 5)

- a functioning **audio recording device** (for Parts 4 and 5)
- Your recording device can be your phone, your computer, or any other device with a recording function.
- **Please test your speakers, microphone, and/or recording device before each part that requires them.**
  - Please do **not** use Safari. Use a different browser, such as Chrome or Firefox.
  - Parts 1, 4, and 5:
    - For these parts, please use a **computer** (not a phone) and set your screen to **full-size**. Please do not use a screen smaller than **11 inches**. The larger your screen, the better. (For Parts 2 and 3, you may use a phone or a smaller computer screen, but a large full-size computer screen is recommended for these parts as well, for maximum visibility and clarity.)
  - Parts 4 and 5:
    - Speak into your recording **device clearly and close to it**, and make sure that you are in **a soundproof room with no interfering sounds**.
    - Create a **single, uninterrupted recording** for each part (one for Part 4 and one for Part 5). Simply start the recording before you begin speaking, and do not stop it until you have reached the end of the whole part of the experiment.

### Procedure

- Time estimates for each part of the experiment:
  - Part 1: **45 minutes** for EXAR and EXEN; **1 hour** for EXSB and EXHS
  - Parts 2 and 3: **40 minutes** each
  - Parts 4 and 5: **20 minutes** each
- You do not need to do all parts in one sitting. You may take breaks between parts, or even do them on different days.
- However, please **do each part in a single sitting**, and **follow the given order** (for example, Parts 1, 2, and 4, in that order; Parts 3 and 5, in that order; etc.)
- Before you begin a part, make sure that you have enough time to complete it in one sitting.
- Parts 4 and 5: You will e-mail your recordings to *[e-mail address redacted]*. If you run into any technical issues, please send an e-mail to this address!
- **In the event that you have to redo anything (for technical reasons or otherwise), please send an e-mail to *[e-mail address redacted]* and indicate what was redone.**

### Experiment Links

- [Part 1](#)
- [Part 2](#)
- [Part 3](#)
- [Part 4](#)
- [Part 5](#)

إرشادات التجربة



شكراً جزيلاً لك على موافقتك على الاشتراك في هذه التجربة. الرجاء قراءة الإرشادات أدناه قبل أن تبدأ، فهي ستساعدك على التهيؤ للتجربة ولما عليك فعله. والكثير من هذه المعلومات موجودة في التعليمات أيضاً. إذا كانت لديك أية أسئلة بخصوص أي شيء مذكور هنا، الرجاء إرسال رسالة إلكترونية إلى عنوان [e-mail address redacted] لطرح أسئلتك قبل أن تبدأ. في نهاية هذا الملف ستجد روابط التجربة.

## بالتوفيق!

### موجز عن التجربة

- تشمل هذه التجربة خمسة أجزاء:
  - الجزء الأول** لا يتمحور على لغة معينة، لا العربية ولا الإنجليزية، وهو يشمل نموذج موافقة واستفتاء وبعض المهام تتعلم فيها بعض خاصيات لغة مصطنعة ومن ثم تُمتحن في ما تعلمته.
  - يشمل كل من **الجزء الثاني والثالث** مهام يُطلب منك فيها الإجابة **كتابيةً**. الجزء الثاني يتمحور على **الإنجليزية** والثالث على **العربية العامية الفلسطينية**.
  - يشمل كل من **الجزء الرابع والخامس** مهام يُطلب منك فيها الإجابة **شفويةً**. الجزء الرابع يتمحور على **الإنجليزية** والخامس على **العربية العامية الفلسطينية**.
- الجزء الثاني والثالث شبه متماثلان، والفرق الوحيد هو اللغة التي يتمحور عليها كل منهما، وكذلك الجزء الرابع والخامس. في كل جزء سيتم الإشارة إلى اللغة التي يتمحور عليها هذا الجزء **بخط أحمر سميك**.
- إذا كان اسم المشترك الخاص بك يبدأ بـ **EXSB** أو **EXHS** فعليك الاشتراك **بكل من الأجزاء الخمسة**.
- إذا كان اسم المشترك الخاص بك يبدأ بـ **EXAR** فعليك الاشتراك **بالجزء الأول والثالث والخامس فقط**.
- إذا كان اسم المشترك الخاص بك يبدأ بـ **EXEN** فعليك الاشتراك **بالجزء الأول والثاني والرابع فقط**.
- في الإرشادات أدناه، الرجاء تجاهل كل ما يتعلق بأجزاء ليس عليك الاشتراك بها.

### معلومات هامة

- كل الإجابات إلزامية.** إذا لم تعرف إجابة ما أو لم تكن متأكدًا منها، خمن أو أشر إلى أنك لا تعرف، حسب ما يرد في التعليمات (أي بقولك بعرفش أو ما بعرف أو باختيار ؟؟؟ أو بكتابة علامة سؤال).
- الرجاء عدم الاستعانة بأية قواميس أو معاجم أو غيرها من المراجع أو وسائل المساعدة. إذا كانت هناك كلمة لا تفهمها في سؤال ما، الرجاء الإجابة على قدر ما تستطيع بناء على معرفتك الشخصية، أو خمن إذا لزم ذلك.
- الجزء الأول: في القسم الثالث، لكل قسم تعلم توقيت محدد، وسيُشار إلى التوقيت المحدد في التعليمات. **هذه هي العناصر الوحيدة في التجربة كلها التي لها توقيت محدد، أما كل العناصر الأخرى فليس لها توقيت محدد.**
- يتمحور الجزء الثالث والخامس على **العربية العامية الفلسطينية**، وليس العربية الفصحى. ستكون **كل** الجمل التي سترأها أو تسمعها والإجابات التي ستعطيها **بالعربية العامية الفلسطينية**. العناصر الوحيدة في كل التجربة التي بالفصحى هي التعليمات. **لا تستخدم الفصحى في إجاباتك!**
- الجزء الثاني حتى الخامس: باستثناء القسم الأول من الجزء الرابع والخامس، يشمل كل قسم بعض الأسئلة للتدريب، والتي ستعطيك الفرصة للتدرب على الإجابة قبل أن تبدأ القسم الحقيقي.
- الجزء الثاني والثالث: سنعطيك كل المواد **بشكل كتابي وبشكل صوتي**. في الجزء الثالث سترد كل المواد المكتوبة بأحرف عربية وإنجليزية. بإمكانك الاختيار بين القراءة والسماع والاثنتين، وبإمكانك فعل أي منهما أي عدد من المرات! لست مُلزمًا على السماع إذا كانت القراءة تفي بالغرض والسماع يبطل عليك عملية القيام بالمهام. أما إذا فضّلت أن تسمع (مثلاً، إذا لم تكن قراءة العربية العامية الفلسطينية بأحرف عربية أو إنجليزية مريحة لك)، فلست مُلزمًا على القراءة. بإمكانك قراءة أي سؤال معين أو سماعه أو الاثنتين أي عدد من المرات، كما ويمكنك التنقل بين القراءة والسماع والاثنتين طيلة التجربة، أو اعتماد طريقة واحدة لكل الأسئلة. **الخيار لك، وليس من حدود أو قيود!**

- الجزء الثالث والخامس: بإمكانك كتابة إجاباتك بأحرف عربية أو إنجليزية أو الاثنين. بإمكانك استخدام أي منهما أو الاثنين في أي سؤال معين، وبإمكانك التنقل بين الأحرف العربية والإنجليزية والاثنين طيلة التجربة، أو اعتماد طريقة واحدة لكل الأسئلة. مرة أخرى، **الخيار لك، وليس من حدود أو قيود!**
- كل التعليمات متوفرة بالإنجليزية والعربية، وترد بالإنجليزية أولاً ومن ثم بالعربية. بإمكانك قراءة التعليمات بالعربية أو بالإنجليزية، حسب ما تفضل. التعليمات في الجزء الثاني والثالث شبه متماثلة، الفرق هو أن كل منها يشير إلى لغة أخرى، أي اللغة التي يتمحور عليها الجزء، وأن الجزء الثالث يشير إلى أن المواد المكتوبة متوفرة بأحرف عربية وإنجليزية. إذا كنت قد قرأت تعليمات الجزء الثاني فبإمكانك تجاهل تعليمات الجزء الثالث أو قراءتها بشكل سطحي، وكذلك بالنسبة للجزء الرابع والخامس.
- الجزء الرابع والخامس: في الجزء الأول، والذي يُطلب منك فيه سرد قصة، قل START (في الجزء الرابع) وبداية (في الجزء الخامس) قبل أن تبدأ، وEND (في الجزء الرابع) أو نهاية (في الجزء الخامس) عندما تنتهي.

### المتطلبات التقنية

- ستحتاج إلى:
  - اتصال بالإنترنت **عالي السرعة**
  - **سماعات لإصدار الصوت** تعمل كما يجب (لكل الأجزاء)
  - **ميكروفون** يعمل كما يجب (للجزء الرابع والخامس)
  - **جهاز تسجيل صوتي** يعمل كما يجب (للجزء الرابع والخامس)
- جهاز التسجيل ممكن أن يكون هاتف أو حاسوب أو أي جهاز آخر يقوم بالتسجيل الصوتي.
- الرجاء فحص السماعات والميكروفون وجهاز التسجيل قبل كل جزء يتطلب استخدامها.
- الجاء **عدم** استخدام سفاري. استخدم متصفحاً آخر مثل كروم أو فايرفوكس.
- الجزء الأول والرابع والخامس:
  - في هذه الأجزاء، استخدم **حاسوباً** (وليس هاتفاً) واستخدم **العرض الكامل** للشاشة. لا تستخدم شاشة أصغر من **١١ بوصة**. كل ما كانت الشاشة أكبر، كان أفضل. (في الجزء الثاني والثالث بإمكانك استخدام هاتف أو شاشة حاسوب أصغر، ولكن يُحَبَّذ استخدام شاشة حاسوب كبيرة بالعرض الكامل كما في الأجزاء الأخرى، للحصول على درجة الوضوح المثلى.)
- الجزء الرابع والخامس:
  - تكلم في جهاز التسجيل **بوضوح وبالقرب منه**، وقم بالتسجيل في **غرفة عازلة للصوت دون أية أصوات خارجية**.
  - سجّل **ملفًا صوتيًا واحدًا دون انقطاع** لكل جزء (واحد للجزء الرابع وواحد للجزء الخامس). ابدأ بالتسجيل قبل أن تبدأ بالتكلم، ولا توقف التسجيل حتى تصل إلى نهاية الجزء كله.

### إرشادات عملية

- تقدير مدة الوقت المطلوبة لكل جزء:
  - الجزء الأول: **ثلاثة أرباع ساعة** لـ EXAR و EXEN؛ **ساعة** لـ EXSB و EXHS
  - الجزء الثاني والثالث: **أربعون دقيقة** لكل منهما
  - الجزء الرابع والخامس: **عشرون دقيقة** لكل منهما
- لست مُلزماً على المشاركة بكل الأجزاء بجلسة واحدة. بإمكانك الاستراحة بين جزء وآخر، أو حتى توزيع الأجزاء المطلوبة على أكثر من يوم.
- لكن عند المشاركة بجزء ما **عليك المشاركة به كله بجلسة واحدة**، **وعليك اتباع ترتيب الأجزاء** (على سبيل المثال، المشاركة بالجزء الأول ثم الثاني ثم الرابع؛ أو الثالث ثم الخامس؛ وهكذا).
- قبل أن تبدأ جزء ما، تأكد من أنه معك ما يكفي من الوقت للمشاركة بهذا الجزء كله بجلسة واحدة.

- الجزء الرابع والخامس: سترسل تسجيلك بالبريد الإلكتروني على عنوان [e-mail address redacted]. إذا واجهت أية مشاكل فنية، الرجاء إرسال رسالة إلكترونية على هذا العنوان!
- إذا اضطررت أن تعيد أي شيء (سواء لأسباب فنية أو لغيرها من الأسباب)، الرجاء إرسال رسالة إلكترونية على عنوان [e-mail address redacted] وتحديد كل ما تم إعادته.

#### روابط التجربة

- [الجزء الأول](#)
- [الجزء الثاني](#)
- [الجزء الثالث](#)
- [الجزء الرابع](#)
- [الجزء الخامس](#)

## APPENDIX G: DEMOGRAPHIC DATA AND SELF-RATED LINGUISTIC PROFICIENCY

### DEMOGRAPHIC DATA – SCHOOL BILINGUALS

Participant	Gender	Age	Place of Birth	Occupation	Highest Level of Education Completed
SB09	F	32	Jerusalem, Israel	Project manager	Master's
SB12	M	26	Jerusalem, Israel	Sales & retention regional manager	High school
SB13	F	26	Jerusalem, Israel	Student (LL.M) / Working lawyer	Master's
SB14	M	26	Jerusalem, Palestine	Project manager (construction)	Master's
SB15	F	26	Sur Baher, Palestine	Program associate / Housewife	Bachelor's
SB16	M	26	Franklin Square, NY, USA	Student / Lab tech	More than high school but less than Bachelor's
SB21	F	21	Jerusalem, Israel	Student / Full-time employee	Bachelor's
SB22	F	27	Jerusalem, Israel	Receptionist	More than high school but less than Bachelor's
SB24	F	28	East Jerusalem, Palestine	Fitness trainer	Bachelor's
SB26	M	25	Jerusalem, Palestine	Masters Student	Master's
SB34	F	29	Jerusalem, Israel	Housewife	more than Bachelor's but less than Master's

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
SB35	M	31	Jerusalem, Israel	Contractor	Bachelor's
SB36	M	25	Jerusalem, Israel	I.T. director	Bachelor's
SB37	M	30	Jerusalem, Israel	Tour guide	Master's
SB41	M	32	Jerusalem, Israel	Insurance salesman	Master's
SB42	F	34	Jerusalem, Israel	Housewife / Dietitian	Master's

DEMOGRAPHIC DATA – HERITAGE SPEAKERS

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
HS13	M	20	Evergreen Park, IL, USA	Student	Bachelor's
HS14	F	20	Chicago, IL, USA	Student	More than high school but less than Bachelor's
HS16	F	22	Hebron, Palestine	Undergraduate student	More than high school but less than Bachelor's
HS17	M	23	Dallas, TX, USA	Student	Bachelor's
HS18	F	21	Chicago, IL, USA	Student	More than high school but less than Bachelor's
HS19	F	20	Chicago, IL, USA	Student	More than high school but less than Bachelor's
HS21	F	18.5	Champaign, IL, USA	Student	More than high school but less than Bachelor's
HS22	F	19	Chicago, IL, USA	Student	More than high school but less than Bachelor's
HS23	F	26	Worcester, MA, USA	Teacher / Housewife	Bachelor's
HS24	F	20	Cincinnati, OH, USA	Student	More than high school but less than Bachelor's

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
HS25	F	21	Austin, TX, USA	Student	More than high school but less than Bachelor's
HS26	M	22	Zarqa, Jordan	Student	More than high school but less than Bachelor's
HS28	F	23	Paterson, NJ, USA	Unemployed	Bachelor's
HS31	F	24	Minneapolis, MN, USA	Product manager	Bachelor's
HS32	F	22	Paterson, NJ, USA	Student	High school
HS34	M	25	Rocky Mount, NC, USA	Actor	Bachelor's
HS37	F	45	Deir Jarir, West Bank, Palestine	Telecommunications / Sales	High school
HS39	F	18	Chicago, IL, USA	Student	More than high school but less than Bachelor's
HS42	F	20	Oak Lawn, IL, United States	Student	More than high school but less than Bachelor's
HS44	F	19	Hinsdale, IL, USA	Student	More than high school but less than Bachelor's
HS46	F	28	Worcester, MA, USA	Teacher	Bachelor's

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
HS48	M	22	Fort Worth, TX, USA	Student	More than high school but less than Bachelor's



DEMOGRAPHIC DATA – ENGLISH NATIVE CONTROLS

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
EN01	F	32.25	Chicago, IL, USA	Spanish to English Translator	Master's
EN03	M	33	St. Charles, MO, USA	Translator	Master's
EN06	M	32	Danville, IL, USA	Interpreter / Translator / Trainer / Academic Advisor	Master's
EN07	M	28	Glen Ellyn, IL, USA	Social Worker	Bachelor's
EN08	F	54	Houghton, MI, US	Translator	more than Bachelor's but less than Master's
EN10	F	20	Milwaukee, WI, USA	Student	More than high school but less than Bachelor's
EN11	F	22.5	Columbus, OH, USA	Student	Bachelor's
EN13	F	44	Gary, IN, USA	Interpreter / Translator	Master's
EN14	M	60	Charlotte, NC, USA	Translator	Bachelor's
EN15	F	49	Wilmington, DE, USA	Non-profit administrator	more than Bachelor's but less than Master's
EN16	M	55	Philadelphia, PA, USA	Editor	Doctorate

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
EN18	F	38	Whitefish, MT, USA	Self-employed	Doctorate
EN19	F	72	Pine Bluff, AR, USA	Translator	Master's
EN21	M	48	Seattle, WA, USA	Translator	Master's
EN22	M	58	Phoenix, AZ, USA	Professor of translation studies (full-time); professional translator (part-time)	Doctorate
EN23	M	72	Norfolk, VA, USA	Translator	Doctorate
EN26	M	35	Germany	Part-time doctoral student	More than Master's but less than doctorate
EN30	F	37	Minneapolis, MN, USA	Translator / Interpreter	Master's
EN31	F	69	Mt. Pleasant, MI, USA	Translator	Master's
EN32	M	61	Washington, DC, USA	Translator	Master's
EN33	F	67	Grants Pass, OR, USA	Semi-retired translator / interpreter	Master's
EN35	M	56	White Plains, NY, USA	Academic administrator	Doctorate

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
EN36	F	35	Peoria, IL, USA	Educational IT	Master's
EN46	F	36	Pittsburgh, PA, USA	Data Processing Analyst	Master's
EN51	M	28	Hartford, CT, USA	Translator	More than Master's but less than doctorate
EN52	F	38	Pittsburgh, PA, USA	Translator	Master's
EN58	M	57	Berkeley, CA, USA	Interpreter / Translator	More than Master's but less than doctorate
EN59	M	42	New Haven, CT, USA	Web developer	More than Master's but less than doctorate
EN61	F	28	Chicago, IL, USA	MA student	more than Bachelor's but less than Master's
EN62	F	38	Phoenix, AZ, USA	Instructor of English	more than Bachelor's but less than Master's
EN65	F	32	Galesburg, IL, USA	Self-employed	Master's
EN66	F	27	Clinton, IA, USA	Project manager	Master's
EN69	M	24	Toledo, OH, USA	Tech industry	Master's

DEMOGRAPHIC DATA – ARABIC NATIVE CONTROLS

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
AR02	M	30	Gaza, Palestine	Student / Translator	More than Master's but less than doctorate
AR05	M	26	Gaza, Palestine	Student	Master's
AR06	F	28	Gaza, Palestine	Student	Bachelor's
AR07	M	36	Abu Ghosh, Jerusalem	Lawyer	Bachelor's
AR08	M	52	Jerusalem	Administrator	Master's
AR09	F	49	Amman, Jordan	Part-time sales associate	more than Bachelor's but less than Master's
AR11	M	28	Haifa, Israel	Call representative	More than high school but less than Bachelor's
AR12	M	53	Bahrain	College administrator	Master's
AR13	M	18.75	Israel	Student	High school
AR14	M	20.75	Salfit, Palestine	Student	High school
AR15	M	18	Nablus, Palestine	Student	High school
AR17	F	39	Nazareth, Palestine	School supervisor	More than Master's but less than doctorate

<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Place of Birth</b>	<b>Occupation</b>	<b>Highest Level of Education Completed</b>
AR18	M	21	Hebron, Palestine	Student	More than high school but less than Bachelor's
AR19	M	25	Nablus, Palestine	Ph.D. Student	Master's
AR20	M	30	Nablus, Palestine	Postdoctoral research associate	Doctorate
AR21	F	41	Amman, Jordan	Freelancer	Master's
AR22	M	34	Jerusalem, Palestine	Head of software development	Bachelor's
AR23	M	25	Gaza	Coordinator	Bachelor's
AR24	F	24	Nazareth, Palestine	Group facilitation student	more than Bachelor's but less than Master's
AR25	F	22	Amman, Jordan	Student	Bachelor's
AR26	F	57	Jerusalem	Retired	Master's
AR28	F	30	Kuwait, Kuwait	Ph.D. Student	Master's

# SELF-REPORTED LANGUAGE PROFICIENCY – SCHOOL BILINGUALS

Participant	Best Language	Languages and Self-Ratings
SB09	English	Arabic - 11 English - 11 Hebrew - 8 Spanish - 3
SB12	English	English - 11 Arabic - 9 Hebrew - 7
SB13	English	Arabic - 11 English - 11 Hebrew - 9 Spanish - 1
SB14	English	Arabic - 11 English - 11 Hebrew - 6 Spanish - 4
SB15	English	English - 11 Arabic - 10 Hebrew - 8
SB16	English / Arabic at equal levels of fluency	Arabic - 11 English - 11 Hebrew - 6 French - 5 Italian - 4 Spanish - 2
SB21	American English	American English - 11 Palestinian Arabic - 10 Hebrew - 5 Polish - 3
SB22	Palestinian Arabic / American English	American English - 11 Palestinian Arabic - 11 Modern Standard Arabic - 9 Hebrew - 4 Spanish - 1
SB24	Palestinian Arabic / American English	American English - 11 Palestinian Arabic - 11 Spanish - 4 Hebrew - 3
SB26	Arabic	Arabic - 11 English - 10 Hebrew - 1

<b>Participant</b>	<b>Best Language</b>	<b>Languages and Self-Ratings</b>
SB34	American English	American English - 11 Palestinian Arabic - 10 Hebrew - 1
SB35	American English	American English - 11 Palestinian Arabic - 11 Hebrew - 1
SB36	American English	American English - 11 Palestinian Arabic - 10
SB37	English	English - 11 Arabic - 11 Hebrew - 4
SB41	English	English - 11 Arabic - 11
SB42	English	American English - 11 Palestinian Arabic - 10 Hebrew - 4

SELF-REPORTED LANGUAGE PROFICIENCY – HERITAGE SPEAKERS

Participant	Best Language	Languages and Self-Ratings
HS13	English	English - 11 Arabic - 10 Spanish - 6
HS14	English	English - 11 Arabic - 7
HS16	English	English - 11 Arabic - 4
HS17	English	English - 11 Arabic - 5
HS18	English	English - 11 Arabic - 8
HS19	English	English - 11 Arabic - 7
HS21	American English	American English - 11 Modern Standard Arabic - 7 Palestinian Arabic - 7 German - 5
HS22	American English	American English - 11 Palestinian Arabic - 3 Standard Arabic - 1
HS23	American English	American English - 11 Palestinian Arabic - 9 Formal Arabic - 9
HS24	English	English - 11 Arabic - 5
HS25	English	English - 11 Arabic - 6
HS26	American English	American English - 11 Palestinian Arabic - 8 Spanish (Spain) - 5
HS28	English	Arabic - 11 English - 11
HS31	English	American English - 11 Arabic - 10
HS32	English	English - 11 Arabic - 2



<b>Participant</b>	<b>Best Language</b>	<b>Languages and Self-Ratings</b>
HS34	English	English - 11 Palestinian Arabic - 7 French -1
HS37	English	English - 11 Arabic - 8
HS39	English	American English - 11 Palestinian Arabic - 8
HS42	American English	American English - 10 Arabic - 7
HS44	American English	American English - 11 Palestinian Arabic - 8
HS46	English	English - 11 Arabic - 6
HS48	American English	American English - 11 Palestinian Arabic - 5

SELF-REPORTED LANGUAGE PROFICIENCY – ENGLISH NATIVE CONTROLS

Participant	Best Language	Languages and Self-Ratings
EN01	American English	English (United States) - 11 Spanish (Latin America) - 8 Spanish (Spain) - 8 French (France) - 5 German (Germany) - 3 Russian (Russia) - 1
EN03	English	American English - 11 Arabic - 9 Spanish - 9 French - 7 Hebrew - 7 Portuguese - 7
EN06	American English	American English - 11 Spanish (Mexican primarily and others) - 9 French - 1 Italian - 1
EN07	American English	American English - 11 Levantine Arabic - 6 Mexican Spanish - 6 Standard Arabic - 4 Standard Italian - 4 Standard Swahili - 2
EN08	American English	American English - 11 French - 10 Indonesian - 4 Mandarin Chinese - 4
EN10	American English	American English - 11 German - 7 Standard Arabic - 1
EN11	American English	American English - 11 Standard Mandarin – 8 Spanish - 4 Cantonese - 2
EN13	English	English - 11 Spanish - 9 Hebrew - 1 Portuguese - 1

Participant	Best Language	Languages and Self-Ratings
EN14	American English	American English – 11 Dutch - 9 German - 9 Bosnian/Croatian/Serbian - 8
EN15	English	English - 11 French - 3 German - 1
EN16	English	English - 11 Russian - 10 Italian - 9 Spanish - 6
EN18	American English	American English - 11 French (France) - 9 Spanish (mixed exposure) - 2
EN19	American English	American English - 11 Standard Arabic - 7 Spanish - 5 Italian - 3
EN21	English	English - 11 Arabic - 8
EN22	American English	American English - 11 Standard German - 10 Standard Dutch - 8 Standard French - 5
EN23	American English	American English - 11 British English - 10 Italian - 10 French - 9 Haitian Creole - 5 Spanish - 4
EN26	English	English - 11 German - 11 Hebrew - 9 Hindi - 9 Urdu - 9 Pashto - 7
EN30	English	English - 11 Spanish - 10 Portuguese - 5 French - 2

Participant	Best Language	Languages and Self-Ratings
EN31	American English	American English - 11 German (Germany) - 10 French - 4 Norwegian - 4 Spanish - 2
EN32	English	English - 11 German - 10 Russian - 6 Serbo-Croatian - 6 French - 5 Italian - 5
EN33	American English	American English - 11 Spanish - 10 French - 5 Norwegian - 1
EN35	American English	American English - 11 Argentine Spanish - 4 French - 1
EN36	English	English - 11 Spanish - 3 German - 2
EN46	English	English - 11 German - 10 Dutch - 8 Spanish - 4 French - 3
EN51	English	English - 11 Russian - 9 Polish - 2 Spanish - 2
EN52	English	English - 11 Spanish - 10 German - 8 Italian - 5 Russian - 2
EN58	English / Spanish	English - 11 Spanish - 10 Portuguese - 6 French - 5

Participant	Best Language	Languages and Self-Ratings
EN59	English	English - 11 Spanish - 7 Arabic - 2 French -1 Hebrew - 1
EN61	American English	American English - 11 France French - 9
EN62	American English	American English - 11 Japanese - 9
EN65	American English	American English - 11 Peruvian Spanish - 9 Castilian Spanish - 8 Mexican Spanish - 8
EN66	American English	American English - 11 French - French -7 German German - 3 Classical Latin - 2 Modern Greek - 1
EN69	English	English - 11

# SELF-REPORTED LANGUAGE PROFICIENCY – ARABIC NATIVE CONTROLS

Participant	Best Language	Languages and Self-Ratings
AR02	Palestinian Arabic	Arabic - 11 English - 10 Turkish - 8
AR05	Arabic	Arabic - 11 English - 10
AR06	Arabic	Arabic - 11 English - 9 French - 1
AR07	Arabic	Arabic - 11 Hebrew - 11 English - 6
AR08	English	English - 11 Arabic - 10 French - 1
AR09	Arabic	Arabic - 11 English - 10 French - 3
AR11	English	English - 9 Arabic - 8 Hebrew - 7
AR12	Arabic	Palestinian Arabic - 11 American English - 10
AR13	Arabic	Modern Standard Arabic - 11 Palestinian Arabic - 11 English - 10 Hebrew - 9
AR14	Arabic	Arabic - 11 English - 9
AR15	Palestinian Arabic	Palestinian Arabic - 11 English - 7 Modern Standard Arabic - 4
AR17	English / Arabic	Arabic - 11 English - 11 Hebrew - 8
AR18	Arabic	Palestinian Arabic - 11 American English - 7 Turkish - 3

Participant	Best Language	Languages and Self-Ratings
AR19	Arabic	Arabic - 11 English - 9 Spanish - 2
AR20	Arabic	Arabic - 11 English - 8
AR21	English	Arabic - 11 English - 11 French - 3 Italian -2
AR22	Arabic	Arabic - 11 American English - 7
AR23	Arabic	Arabic - 11 English - 10 Hebrew - 2 French -1
AR24	Arabic	Palestinian Arabic - 11 Modern Standard Arabic - 9 English - 8 Hebrew - 8
AR25	Arabic	Modern Standard Arabic - 11 Palestinian Arabic - 11 American English - 9 German -7 Italian - 2
AR26	Arabic	Arabic - 11 English - 9
AR28	Arabic	Arabic - 11 English - 9

## APPENDIX H: SCHOOL BILINGUALS' AND HERITAGE SPEAKERS' LINGUISTIC QUESTIONNAIRE SCORES AND LANGUAGE APTITUDE SCORES

### LANGUAGE USE AND EXPOSURE SCORES

Grp	Ppt	Activity					Stage				Setting				
		L	SP	R	W	Glb	1	2	3	4	Glb	H	SC	O	Glb
SB	SB09	-0.26	-0.23	0.93	0.93	1.37	-0.88	0.26	0.49	0.24	0.11	-0.13	0.6	0.25	0.72
	SB12	-0.04	0.08	0.38	0.76	1.18	-0.05	0.09	0.51	0.19	0.74	-0.09	0.55	0.3	0.76
	SB13	-0.14	-0.12	0.54	0.66	0.94	-0.33	0.43	0.07	0.11	0.28	-0.11	0.36	0.26	0.51
	SB14	-0.29	-0.42	0.43	0.48	0.2	-0.73	-0.03	0.03	0.21	-0.52	-0.23	0.32	-0.13	-0.04
	SB15	0.05	0.03	0.78	0.71	1.57	-0.75	0.2	0.62	0.54	0.61	0.07	0.6	0.33	1
	SB16	0.32	0.26	0.55	0.58	1.71	0	0.46	0.45	0.4	1.31	0.28	0.73	0.24	1.25
	SB21	0.41	0.58	0.81	1	2.8	0.38	0.63	0.77	0.65	2.43	0.65	0.88	0.47	2
	SB22	-0.07	-0.2	0.98	0.95	1.66	-0.2	0.41	0.34	0.31	0.86	0.24	0.4	0.29	0.93
	SB24	-0.23	-0.23	0.58	0.68	0.8	-0.93	0.17	0.24	0.3	-0.22	0.06	0.37	-0.06	0.37
	SB26	-0.37	-0.42	0.51	0.59	0.31	-0.98	-0.04	0.03	0.44	-0.55	-0.11	0.19	-0.1	-0.02
	SB34	0.15	0.35	0.79	0.85	2.14	0.1	0.37	0.46	0.88	1.81	0.44	0.64	0.38	1.46
	SB35	-0.02	0.11	0.81	0.81	1.71	-0.25	0.28	0.34	0.81	1.18	0.21	0.53	0.34	1.08
	SB36	0.06	0.02	0.6	0.6	1.28	-0.3	-0.13	0.56	0.71	0.84	0.3	0.55	-0.02	0.83
	SB37	-0.05	0.02	0.8	0.8	1.57	-0.2	0.34	0.36	0.43	0.93	0.27	0.48	0.2	0.95
	SB41	0.12	0.27	0.85	0.91	2.15	0.03	0.48	0.44	0.71	1.66	0.14	0.74	0.56	1.44
	SB42	-0.23	-0.13	0.50	0.56	0.7	0	0	0.24	0.09	0.33	0.15	0.23	-0.06	0.33
HS	HS13	0	-0.13	0.73	0.75	1.35	-0.25	0.33	0.33	0.25	0.66	0.01	0.53	0.26	0.8
	HS14	0.25	0.52	0.89	0.87	2.53	0.18	0.7	0.64	0.48	2	0.21	0.76	0.8	1.77
	HS16	0.63	0.8	0.85	0.91	3.19	0.9	0.98	0.87	0.23	2.98	0.72	0.92	0.72	2.36
	HS17	0.37	0.35	1	1	2.72	0.2	0.71	0.69	0.53	2.13	0.24	0.87	0.77	1.88
	HS18	0.51	0.53	0.73	0.73	2.5	0.15	0.57	0.67	0.75	2.14	0.29	0.6	0.91	1.8
	HS19	0.39	0.47	0.38	0.38	1.62	0.65	0	0.75	0.4	1.8	0.35	0.39	0.48	1.22
	HS21	0.42	0.47	0.53	0.78	2.2	-0.3	0.66	0.64	0.5	1.5	0.37	1	0.27	1.64
	HS22	0.49	0.55	0.9	0.91	2.85	-0.83	0.8	0.92	0.78	1.67	0.41	0.98	0.68	2.07
	HS23	0.35	0.53	0.61	0.81	2.3	0.28	0.59	0.64	0.46	1.97	0.16	0.76	0.76	1.68
	HS24	0.5	0.59	0.61	0.76	2.46	0.35	0.79	0.63	0.35	2.12	0.37	0.77	0.69	1.83
	HS25	0.52	0.76	0.85	0.81	2.94	0.58	0.48	0.89	0.9	2.85	0.58	0.75	0.82	2.15
	HS26	0.33	0.26	0.78	0.81	2.18	-0.43	0.44	0.73	0.64	1.38	0.08	0.76	0.68	1.52
	HS28	0.44	0.42	0.5	0.5	1.86	-0.18	0.43	0.71	0.38	1.34	-0.09	1	0.54	1.45
	HS31	0.15	-0.01	0.39	0.36	0.89	-0.63	-0.28	0.61	0.69	0.39	-0.01	0.35	0.26	0.6
	HS32	0.15	0.4	0.63	0.6	1.78	0.3	0.43	0.64	0.03	1.4	0.43	0.55	0.27	1.25
	HS34	0.64	0.56	0.96	0.96	3.12	-0.1	0.88	0.79	0.85	2.42	0.51	0.92	0.83	2.26
	HS37	0.38	0.43	0.88	0.9	2.59	0.4	0.63	0.75	0.38	2.16	0.29	0.84	0.7	1.83
	HS39	0.33	0.35	0.55	0.55	1.78	0	0.54	0.57	0.18	1.29	0.29	1	0.07	1.36
	HS42	0.73	0.84	0.94	0.95	3.46	0.61	0.84	0.89	0.94	3.28	0.71	0.86	0.99	2.56
	HS44	0.61	0.68	0.9	0.95	3.14	0.6	0.86	0.67	0.8	2.93	0.66	0.83	0.79	2.28
	HS46	0.47	0.65	0.84	0.88	2.84	0.7	0.57	0.76	0.7	2.73	0.21	0.84	1	2.05
	HS48	0.45	0.55	0.95	0.95	2.9	0.05	0.74	0.86	0.58	2.23	0.36	1	0.73	2.09

Grp = Group; Ppt = Participant; SB = school bilinguals; HS = heritage speakers; L = listening; SP = speaking; R = reading; W = writing

1 = from birth until the start of schooling; 2 = kindergarten and elementary school

3 = middle school / junior high school and high school; 4 = since graduating from high school

H = home; SC = school; O = outside home and school



# SOCIOAFFECTIVE FACTOR SCORES

Grp	Ppt	English/United States							Arabic/Arab World						
		During School			Since Graduation			Glb	During School			Since Graduation			Glb
		S	P	A	S	P	A		S	P	A	S	P	A	
SB	SB09	7.6	6.2	6.4	8.3	7.5	6	7	9.4	9.5	9.8	9.3	9.4	9.7	9.5
	SB12	8.3	7.8	7.8	4.8	6.4	3.7	6.5	1.7	2.6	4.8	7.7	6.9	7.9	5.3
	SB13	8.2	7.9	8.5	7.5	6.8	7.3	7.7	8.8	8.5	9.3	9.1	9	9.2	9
	SB14	4.3	4.1	4.5	3	4.2	5.1	4.2	8.2	9	9.1	9.6	9.5	9.3	9.1
	SB15	8.4	6.7	6.9	7.9	8.6	7.1	7.6	7.5	8.5	7.3	7.3	8.8	7.4	7.8
	SB16	7.2	6.8	5	7	7.3	5.1	6.4	7.4	7.3	7.2	5.8	5.8	7.3	6.8
	SB21	8	7.8	5.7	6.3	5.6	3.8	6.2	4	4.7	6.4	7	6	8.3	6.1
	SB22	8.7	9.3	7.9	7.8	8.4	7.7	8.3	4.7	4.4	5.8	6	5.4	5.7	5.3
	SB24	6.2	5.7	6.5	6	6	5.7	6	7.7	6.5	5.5	7.8	7.9	6.3	7
	SB26	4.9	4.4	6.2	6.2	4.3	5	5.2	9.7	9.2	10	9.6	9.6	9.8	9.7
	SB34	5.5	5.4	7.4	6.8	6.1	7.9	6.5	5.7	6.9	6.8	5.3	5.5	7.4	6.3
	SB35	8.5	7.3	9.3	8.4	8.6	8.7	8.5	6.6	7.9	8.4	8.3	8.3	8	7.9
	SB36	7.5	8.3	8.4	8.6	8.9	8.6	8.4	2.4	3.6	2.1	2	1.8	2	2.3
	SB37	7.9	8	6.9	8.7	8.7	7	7.9	5.5	5	5.9	7.2	4.7	8.3	6.1
	SB41	6.3	6.3	7.4	6.8	5.8	5	6.3	3.8	6	7.3	5.9	5.7	8.7	6.2
	SB42	8.9	8.7	9.4	8	7.4	4.2	7.8	3.7	4.4	3.9	6.6	7.3	9.1	5.8
HS	HS13	7.4	6.6	5.8	6.8	6.7	5.7	6.5	7.9	7.9	8.8	9.9	9.8	10	9.1
	HS14	5.9	6.9	3.9	6	7.1	3.7	5.6	10	9.5	9.5	9.6	9.7	9.8	9.7
	HS16	9.2	9.6	7.5	7.3	7.7	6.6	8	0	1	1.6	1.7	2.5	1.3	1.4
	HS17	6.2	6.3	3.6	2.7	6.5	4.3	4.9	4.9	5.3	8	10	9.1	10	7.9
	HS18	3.1	3.2	2	2.9	3.4	1	2.6	9.7	9	10	9.9	9.5	10	9.7
	HS19	0.7	1.9	0.5	0.2	2.5	0.4	1	9.2	7.3	9.6	9.8	8.1	10	9
	HS21	6.9	6.6	6.4	6.1	6.8	6.1	6.5	8.7	7.3	9.1	8.2	7.5	8	8.1
	HS22	1.6	2.3	1	0.2	2	0.6	1.3	7	5.5	6.1	8.4	6.3	7	6.7
	HS23	5.1	3.5	4.8	4.8	4.2	5.6	4.7	8.6	5.8	7.7	7.2	7.6	7.6	7.4
	HS24	7.2	7.5	7	5	5.4	4	6	7.8	7.2	6.6	8.7	8.2	8	7.8
	HS25	4.7	4.9	6.6	5	5.2	5.8	5.4	5.4	5.1	6.5	6.2	5.2	6.2	5.8
	HS26	8.2	6.5	7.9	3.6	3.6	3.5	5.6	5.5	5.5	6.6	7	6.2	7.4	6.4
	HS28	9.5	9.2	9	9.4	9.6	8.9	9.3	9.6	9.4	9.5	10	9.7	9.6	9.6
	HS31	7.8	8.3	7.5	8.6	8.4	6.7	7.9	7.1	7.3	7.1	7	7.7	7.8	7.3
	HS32	8.8	7.3	7.2	8.4	8.1	7	7.8	9.2	9.5	8.6	9.1	8.6	9.1	9
	HS34	5.8	4.2	5	2.4	3.5	2.8	4	8.5	7.6	6.9	9.9	8.6	9.6	8.5
	HS37	7.7	7.4	7.7	7.7	7.3	7.8	7.6	6.7	7.2	7	8.9	9.2	8.1	7.9
	HS39	0.4	2.4	1.7	0.2	1.6	1.6	1.3	8.5	7.4	8.4	9.8	8.3	8.8	8.5
	HS42	4.2	5	4.1	4.6	5.1	3.9	4.5	9.4	8.8	9.6	9.4	7.2	9.9	9.1
	HS44	8.2	6.5	5.7	6.7	6.3	4.9	6.4	9	9.1	7.9	8.2	9	6.5	8.3
	HS46	8.6	8.3	5.1	6.8	6.6	5.2	6.8	4.4	4.2	5	8.6	8.4	9.5	6.7
	HS48	4.9	5.3	5.1	5.2	5.8	4.9	5.2	5.2	5.5	5.9	5.5	5	5.5	5.4

Grp = Group; Ppt = Participant; SB = school bilinguals; HS = heritage speakers

S = social; P = personal; A = attitudinal; Glb = global score

LANGUAGE APTITUDE SCORES

Grp	Participant	LLAMA_B	LLAMA_E	LLAMA_F	Global
SB	SB09	10	10	14	34
	SB12	8	3	16	27
	SB13	10	1	15	26
	SB14	9	1	13	23
	SB15	1	11	11	23
	SB16	10	4	18	32
	SB21	3	1	14	18
	SB22	2	1	12	15
	SB24	11	0	16	27
	SB26	10	19	14	43
	SB34	14	10	17	41
	SB35	2	11	15	28
	SB36	15	15	13	43
	SB37	8	1	17	26
	SB41	5	0	13	18
	SB42	1	0	13	14
HS	HS13	3	3	18	24
	HS14	7	0	13	20
	HS16	8	2	18	28
	HS17	1	0	12	13
	HS18	6	7	11	24
	HS19	4	2	10	16
	HS21	11	18	15	44
	HS22	6	1	13	20
	HS23	19	2	8	29
	HS24	20	0	8	28
	HS25	0	2	12	14
	HS26	1	11	16	28
	HS28	1	1	11	13
	HS31	9	1	14	24
	HS32	2	2	9	13
	HS34	9	2	19	30
	HS37	1	2	15	18
	HS39	15	7	13	35
	HS42	7	3	11	21
	HS44	11	0	18	29
	HS46	16	4	19	39
	HS48	2	2	8	12

Grp = Group; SB = school bilinguals; HS = heritage speakers

# APPENDIX I: MEAN ELICITED IMITATION TASK SCORES BY GROUP AND PARTICIPANT

English						Arabic					
SB	0.98	By Group		EN	1	SB	0.99	By Group		AR	0.99
		HS	0.98					HS	0.58		
By Participant						By Participant					
SB09	0.97	HS13	0.97	EN01	1	SB09	1	HS13	0.47	AR02	1
SB12	1	HS14	0.93	EN03	0.97	SB12	1	HS14	0.83	AR05	1
SB13	1	HS16	1	EN06	1	SB13	1	HS16	0.9	AR06	1
SB14	1	HS17	0.93	EN07	1	SB14	0.97	HS17	0.4	AR07	0.97
SB15	1	HS18	1	EN08	1	SB15	1	HS18	0.7	AR08	1
SB16	1	HS19	1	EN10	1	SB16	1	HS19	0.97	AR09	0.97
SB21	0.87	HS21	1	EN11	1	SB21	1	HS21	0.7	AR11	1
SB22	1	HS22	1	EN13	1	SB22	1	HS22	0.07	AR12	0.9
SB24	1	HS23	0.97	EN14	1	SB24	1	HS23	0.7	AR13	1
SB26	1	HS24	0.97	EN15	1	SB26	1	HS24	0.17	AR14	1
SB34	0.97	HS25	1	EN16	1	SB34	0.97	HS25	0.73	AR15	1
SB35	1	HS26	1	EN18	1	SB35	1	HS26	0.33	AR17	1
SB36	1	HS28	0.97	EN19	1	SB36	1	HS28	0.24	AR18	1
SB37	0.97	HS31	1	EN21	1	SB37	1	HS31	0.93	AR19	1
SB41	0.97	HS32	0.97	EN22	1	SB41	0.97	HS32	0.31	AR20	1
SB42	1	HS34	0.97	EN23	1	SB42	0.97	HS34	0.5	AR21	0.97
		HS37	1	EN26	1			HS37	0.59	AR22	1
		HS39	1	EN30	1			HS39	0.83	AR23	1
		HS42	0.97	EN31	1			HS42	0.77	AR24	1
		HS44	1	EN32	1			HS44	0.33	AR25	1
		HS46	0.97	EN33	1			HS46	0.87	AR26	0.93
		HS48	1	EN35	0.97			HS48	0.37	AR28	1
				EN36	1						
				EN46	1						
				EN51	0.97						
				EN52	1						
				EN58	1						
				EN59	1						
				EN61	1						
				EN62	1						
				EN65	1						
				EN66	1						
				EN69	0.97						

SB = school bilinguals; HS = heritage speakers; EN = English native controls; AR = Arabic native controls

SB = school bilinguals; HS = heritage speakers; EN = English native controls; AR = Arabic native controls

## APPENDIX J: DESCRIPTIVE STATISTICS BY GROUP AND CONDITION FOR TVJTS AND GJTS

### ENGLISH TVJT

Grp	Stats	Article Semantics				Verbal Aspect			
		BRT	THT	BRF	THF	PPP	PSN	PPN	PSP
SB	Mean	0.95	0.97	0.02	0.04	1.00	0.85	0.04	0.10
	SD	0.13	0.09	0.06	0.10	0.00	0.23	0.10	0.16
	Max	1.00	1.00	0.17	0.33	1.00	1.00	0.33	0.50
	Min	0.50	0.67	0.00	0.00	1.00	0.33	0.00	0.00
HS	Mean	0.87	0.89	0.15	0.17	0.97	0.77	0.09	0.26
	SD	0.22	0.22	0.24	0.31	0.07	0.25	0.16	0.30
	Max	1.00	1.00	0.83	1.00	1.00	1.00	0.67	1.00
	Min	0.33	0.17	0.00	0.00	0.83	0.33	0.00	0.00
EN	Mean	0.98	0.99	0.05	0.03	0.99	0.73	0.02	0.20
	SD	0.06	0.04	0.15	0.07	0.04	0.33	0.05	0.32
	Max	1.00	1.00	0.67	0.33	1.00	1.00	0.17	1.00
	Min	0.67	0.83	0.00	0.00	0.83	0.00	0.00	0.00

Grp = Group; Mean = Mean of Participant Means (Group Mean); SD = Standard Deviation of Participant Means

Max = Maximum Participant Mean; Min = Minimum Participant Mean

SB = school bilinguals; HS = heritage speakers; EN = English native controls

BRT = bare plural, true; THT = “the”, true; BRF = bare plural, false; THF = “the”, false

PPP = present prog., positive; PSN = present simple, negative; PPN = present prog., negative; PSP = present simple, positive

## ENGLISH GJT

Grp	Stats	Resumptive Pronouns		Double Objects				Adverb Word Order					
		GAP	RES	BTH	ENG	NTR	NNS	P1G	P2G	P4G	P1U	P2U	P3U
SB	Mean	5.64	1.98	5.43	4.69	1.71	1.10	4.69	5.94	5.97	1.80	2.15	2.01
	SD	0.38	1.10	0.82	0.98	0.86	0.21	0.96	0.21	0.09	1.16	1.31	1.19
	Max	6.00	4.00	6.00	6.00	3.17	1.67	5.67	6.00	6.00	5.00	4.67	4.00
	Min	4.83	1.00	2.67	1.83	1.00	1.00	2.17	5.17	5.67	1.00	1.00	1.00
HS	Mean	5.42	3.22	5.51	5.07	2.89	1.81	5.13	5.73	5.75	3.12	3.66	3.16
	SD	0.67	1.43	0.50	0.89	1.23	1.21	0.91	0.59	0.46	1.35	1.30	1.32
	Max	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
	Min	4.00	1.00	4.50	2.83	1.00	1.00	2.50	3.50	4.17	1.17	1.33	1.00
EN	Mean	5.77	2.76	5.78	5.34	2.57	1.36	5.64	5.95	5.91	3.04	3.44	3.07
	SD	0.37	0.98	0.41	0.57	0.84	0.69	0.43	0.17	0.24	0.88	0.99	0.91
	Max	6.00	4.83	6.00	6.00	4.33	3.50	6.00	6.00	6.00	4.83	5.00	4.50
	Min	4.67	1.00	4.33	3.83	1.00	1.00	4.33	5.17	4.83	1.33	1.33	1.00

Grp = Group; Mean = Mean of Participant Means (Group Mean); SD = Standard Deviation of Participant Means  
Max = Maximum Participant Mean; Min = Minimum Participant Mean  
SB = school bilinguals; HS = heritage speakers; EN = English native controls  
GAP = gap at extraction site; RES = resumptive pronoun at extraction site  
BTH = DOC grammatical in both English and Arabic; ENG = DOC grammatical in English only  
NTR = DOC grammatical in neither English nor Arabic; NNS = semantically nonsensical  
P1G = adv. in Position 1, grammatical; P2G = adv. in Position 2, grammatical; P4G = adv. in Position 4, grammatical  
P1U = adv. in Position 1, ungrammatical; P2U = adv. in Position 2, ungrammatical; P3U = adv. in Position 3, ungrammatical

## ARABIC TVJT

Grp	Stats	Article Semantics				Verbal Aspect			
		GNC	SPC	ALL	DEM	PPP	PSP	PPD	PPN
SB	Mean	<b>0.77</b>	<b>0.33</b>	<b>0.01</b>	<b>0.03</b>	<b>1.00</b>	<b>0.42</b>	<b>0.04</b>	<b>0.04</b>
	SD	0.29	0.29	0.04	0.07	0.00	0.39	0.10	0.07
	Max	1.00	0.83	0.17	0.17	1.00	1.00	0.33	0.17
	Min	0.17	0.00	0.00	0.00	1.00	0.00	0.00	0.00
HS	Mean	<b>0.54</b>	<b>0.55</b>	<b>0.17</b>	<b>0.15</b>	<b>0.80</b>	<b>0.64</b>	<b>0.36</b>	<b>0.33</b>
	SD	0.32	0.36	0.26	0.21	0.30	0.35	0.26	0.31
	Max	1.00	1.00	0.83	0.83	1.00	1.00	1.00	1.00
	Min	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00
AR	Mean	<b>0.78</b>	<b>0.24</b>	<b>0.08</b>	<b>0.11</b>	<b>0.97</b>	<b>0.68</b>	<b>0.08</b>	<b>0.11</b>
	SD	0.28	0.32	0.19	0.23	0.07	0.34	0.15	0.18
	Max	1.00	1.00	0.83	1.00	1.00	1.00	0.67	0.67
	Min	0.17	0.00	0.00	0.00	0.83	0.00	0.00	0.00

Grp = Group; Mean = Mean of Participant Means (Group Mean); SD = Standard Deviation of Participant Means  
 Max = Maximum Participant Mean; Min = Minimum Participant Mean  
 SB = school bilinguals; HS = heritage speakers; AR = Arabic native controls  
 GNC = “the”, generic trait; SPC = “the”, specific trait; DEM = demonstrative, generic trait; ALL = “all”, specific trait  
 PPP = present prog., positive; PSP = present simple, positive; PPD = present prog., different action; PPN = present prog., negative

## ARABIC GJT

Grp	Stats	Resumptive Pronouns		Double Objects				Adverb Word Order					
		RES	GAP	BTH	CAU	ENG	NTR	P1G	P2G	P3G	P3U	S4U	V4U
SB	Mean	4.52	3.14	5.38	5.22	2.01	1.68	4.66	5.15	3.28	1.69	1.67	1.52
	SD	1.59	1.41	0.98	0.70	0.99	0.92	0.86	1.05	1.13	0.99	1.00	0.77
	Max	6.00	6.00	6.00	6.00	4.67	3.83	6.00	6.00	5.17	3.67	3.83	3.33
	Min	1.17	1.00	2.17	3.50	1.00	1.00	3.33	2.83	1.50	1.00	1.00	1.00
HS	Mean	4.93	4.77	4.92	4.85	4.26	4.07	4.84	5.06	4.24	3.32	3.69	3.48
	SD	0.97	0.97	0.80	0.77	1.17	0.97	0.83	0.89	1.14	1.28	1.14	1.12
	Max	6.00	6.00	6.00	6.00	6.00	5.83	6.00	6.00	5.67	6.00	6.00	5.67
	Min	3.17	2.67	3.33	3.17	1.00	2.33	3.17	3.00	1.00	1.00	1.17	1.00
AR	Mean	5.59	3.39	5.35	5.10	2.48	2.29	4.61	5.47	4.52	2.29	2.49	2.23
	SD	0.64	1.29	0.86	0.97	1.07	0.98	0.83	0.49	0.89	0.97	1.03	0.94
	Max	6.00	6.00	6.00	6.00	4.33	4.17	5.67	6.00	6.00	3.83	5.33	4.17
	Min	4.00	1.00	3.17	2.67	1.00	1.00	2.50	4.50	2.17	1.00	1.00	1.00

Grp = Group; Mean = Mean of Participant Means (Group Mean); SD = Standard Deviation of Participant Means

Max = Maximum Participant Mean; Min = Minimum Participant Mean

SB = school bilinguals; HS = heritage speakers; AR = Arabic native controls

RES = resumptive pronoun at extraction site; GAP = gap at extraction site

BTH = DOC grammatical in both English and Arabic; CAU = causative verb

ENG = DOC grammatical in English only; NTR = DOC grammatical in neither English nor Arabic

P1G = adv. in Position 1, grammatical; P2G = adv. in Position 2, grammatical; P3G = adv. in Position 3, grammatical

P3U = adv. in Position 3, ungrammatical; S4U = adv. in Position 4, ungrammatical, SVO order.; V4U = adv. in Position 4, ungrammatical, VSO order

## APPENDIX K: INTERACTIONS BETWEEN GROUP AND CONDITION FOR TVJTS AND GJTS

### ENGLISH TVJT AND GJT

Measure	Condition	contrast	condition	estimate	SE	df	z.ratio	p.value	S
Article Semantics	BRT	EN - HS	EN-TVJT-R-BRT	0.1134	0.0308	2142	3.688	0.0054	*
		EN - SB	EN-TVJT-R-BRT	0.0367	0.0340	2142	1.079	0.9974	
		HS - SB	EN-TVJT-R-BRT	-0.0767	0.0367	2142	-2.090	0.5354	
	THT	EN - HS	EN-TVJT-R-THT	0.0957	0.0308	2142	3.113	0.0415	*
		EN - SB	EN-TVJT-R-THT	0.0209	0.0340	2142	0.615	1.0000	
		HS - SB	EN-TVJT-R-THT	-0.0748	0.0367	2142	-2.038	0.5792	
	BRF	EN - HS	EN-TVJT-R-BRF	-0.1056	0.0308	2142	-3.435	0.0138	*
		EN - SB	EN-TVJT-R-BRF	0.0250	0.0340	2142	0.736	1.0000	
		HS - SB	EN-TVJT-R-BRF	0.1307	0.0367	2142	3.560	0.0087	*
	THF	EN - HS	EN-TVJT-R-THF	-0.1486	0.0308	2142	-4.831	<.0001	*
		EN - SB	EN-TVJT-R-THF	-0.0160	0.0340	2142	-0.470	1.0000	
		HS - SB	EN-TVJT-R-THF	0.1326	0.0367	2142	3.612	0.0072	*
Verbal Aspect	PPP	EN - HS	EN-TVJT-S-PPP	0.0196	0.0308	2142	0.636	1.0000	
		EN - SB	EN-TVJT-S-PPP	-0.0108	0.0340	2142	-0.316	1.0000	
		HS - SB	EN-TVJT-S-PPP	-0.0303	0.0367	2142	-0.825	0.9999	
	PSN	EN - HS	EN-TVJT-S-PSN	-0.0335	0.0308	2142	-1.089	0.9971	
		EN - SB	EN-TVJT-S-PSN	-0.1225	0.0340	2142	-3.599	0.0075	*
		HS - SB	EN-TVJT-S-PSN	-0.0890	0.0367	2142	-2.425	0.2809	
	PPN	EN - HS	EN-TVJT-S-PPN	-0.0752	0.0308	2142	-2.444	0.2690	
		EN - SB	EN-TVJT-S-PPN	-0.0259	0.0340	2142	-0.761	1.0000	
		HS - SB	EN-TVJT-S-PPN	0.0492	0.0367	2142	1.341	0.9752	
	PSP	EN - HS	EN-TVJT-S-PSP	-0.0600	0.0308	2142	-1.951	0.6522	
		EN - SB	EN-TVJT-S-PSP	0.0934	0.0340	2142	2.744	0.1259	
		HS - SB	EN-TVJT-S-PSP	0.1534	0.0367	2142	4.179	0.0007	*
Resumptive Pronouns	GAP	EN - HS	EN-GJT-R-GAP	0.6757	0.497	Inf	1.360	0.9069	
		EN - SB	EN-GJT-R-GAP	0.2808	0.557	Inf	0.504	1.0000	
		HS - SB	EN-GJT-R-GAP	-0.3948	0.590	Inf	-0.669	1.0000	
	RES	EN - HS	EN-GJT-R-RES	-0.6828	0.448	Inf	-1.523	0.8204	
		EN - SB	EN-GJT-R-RES	1.7348	0.507	Inf	3.420	0.0148	*
		HS - SB	EN-GJT-R-RES	2.4176	0.549	Inf	4.400	0.0003	*
Double Objects	BTH	EN - HS	EN-GJT-D-BTH	0.8074	0.508	Inf	1.588	0.7782	
		EN - SB	EN-GJT-D-BTH	0.8457	0.563	Inf	1.502	0.8324	
		HS - SB	EN-GJT-D-BTH	0.0383	0.595	Inf	0.064	1.0000	
	ENG	EN - HS	EN-GJT-D-ENG	0.3994	0.475	Inf	0.842	0.9991	
		EN - SB	EN-GJT-D-ENG	1.3314	0.524	Inf	2.542	0.1725	
		HS - SB	EN-GJT-D-ENG	0.9320	0.565	Inf	1.651	0.7353	
	NTR	EN - HS	EN-GJT-D-NTR	-0.4797	0.451	Inf	-1.063	0.9873	
		EN - SB	EN-GJT-D-NTR	2.1580	0.517	Inf	4.172	0.0008	*
		HS - SB	EN-GJT-D-NTR	2.6377	0.560	Inf	4.707	0.0001	*
	NNS	EN - HS	EN-GJT-D-NNS	-1.1528	0.476	Inf	-2.420	0.2259	
		EN - SB	EN-GJT-D-NNS	2.1322	0.661	Inf	3.224	0.0273	*
		HS - SB	EN-GJT-D-NNS	3.2850	0.689	Inf	4.771	<.0001	*
Adverb Word Order	P1G	EN - HS	EN-GJT-A-P1G	0.9677	0.476	Inf	2.033	0.4554	
		EN - SB	EN-GJT-A-P1G	2.2230	0.518	Inf	4.290	0.0004	*
		HS - SB	EN-GJT-A-P1G	1.2553	0.554	Inf	2.264	0.3076	
	P2G	EN - HS	EN-GJT-A-P2G	1.2590	0.656	Inf	1.919	0.5377	
		EN - SB	EN-GJT-A-P2G	-0.0826	0.831	Inf	-0.099	1.0000	
		HS - SB	EN-GJT-A-P2G	-1.3415	0.793	Inf	-1.691	0.7066	
	P4G	EN - HS	EN-GJT-A-P4G	0.9073	0.592	Inf	1.532	0.8150	
		EN - SB	EN-GJT-A-P4G	-1.0233	0.844	Inf	-1.213	0.9591	
		HS - SB	EN-GJT-A-P4G	-1.9307	0.841	Inf	-2.296	0.2893	
	P1U	EN - HS	EN-GJT-A-P1U	-0.1879	0.446	Inf	-0.421	1.0000	
		EN - SB	EN-GJT-A-P1U	2.4732	0.509	Inf	4.857	<.0001	*
		HS - SB	EN-GJT-A-P1U	2.6610	0.550	Inf	4.839	<.0001	*
	P2U	EN - HS	EN-GJT-A-P2U	-0.3740	0.446	Inf	-0.838	0.9992	
		EN - SB	EN-GJT-A-P2U	2.2995	0.502	Inf	4.584	0.0002	*
		HS - SB	EN-GJT-A-P2U	2.6735	0.544	Inf	4.918	<.0001	*
	P3U	EN - HS	EN-GJT-A-P3U	-0.1782	0.444	Inf	-0.401	1.0000	
		EN - SB	EN-GJT-A-P3U	1.9639	0.502	Inf	3.914	0.0022	*
		HS - SB	EN-GJT-A-P3U	2.1420	0.543	Inf	3.947	0.0025	*

SE = standard error; df = degrees of freedom; Inf = infinite; S = significance; \* = statistically significant (p-value < 0.05)

SB = school bilinguals; HS = heritage speakers; EN = English native controls

BRT = bare plural, true; THT = "the", true; BRF = bare plural, false; THF = "the", false

PPP = present prog., positive; PSN = present simple, negative; PPN = present prog., negative; PSP = present simple, positive

GAP = gap at extraction site; RES = resumptive pronoun at extraction site

BTH = DOC grammatical in both English and Arabic; ENG = DOC grammatical in English only

NTR = DOC grammatical in neither English nor Arabic; NNS = semantically nonsensical

P1G = adv. in Position 1, grammatical; P2G = adv. in Position 2, grammatical; P4G = adv. in Position 4, grammatical

P1U = adv. in Position 1, ungrammatical; P2U = adv. in Position 2, ungrammatical; P3U = adv. in Position 3, ungrammatical



# ARABIC TVJT AND GJT

Measure	Condition	contrast	condition	estimate	SE	df	z.ratio	p.value	S
Article Semantics	GNC	AR - HS	AR-TVJT-R-GNC	0.24242	0.0501	656	4.840	<.0001	*
		AR - SB	AR-TVJT-R-GNC	0.00947	0.0546	656	0.174	1.0000	
		HS - SB	AR-TVJT-R-GNC	-0.23295	0.0546	656	-4.268	0.0005	*
	SPC	AR - HS	AR-TVJT-R-SPC	-0.30303	0.0501	656	-6.051	<.0001	*
		AR - SB	AR-TVJT-R-SPC	-0.09091	0.0546	656	-1.666	0.8427	
		HS - SB	AR-TVJT-R-SPC	0.21212	0.0546	656	3.887	0.0026	*
	ALL	AR - HS	AR-TVJT-R-ALL	-0.09848	0.0501	656	-1.966	0.6214	
		AR - SB	AR-TVJT-R-ALL	0.06534	0.0546	656	1.197	0.9896	
		HS - SB	AR-TVJT-R-ALL	0.16383	0.0546	656	3.002	0.0596	
	DEM	AR - HS	AR-TVJT-R-DEM	-0.04545	0.0501	656	-0.908	0.9995	
		AR - SB	AR-TVJT-R-DEM	0.07481	0.0546	656	1.371	0.9634	
		HS - SB	AR-TVJT-R-DEM	0.12027	0.0546	656	2.204	0.4282	
Verbal Aspect	PPP	AR - HS	AR-TVJT-S-PPP	0.17424	0.0501	656	3.479	0.0122	*
		AR - SB	AR-TVJT-S-PPP	-0.03030	0.0546	656	-0.555	1.0000	
		HS - SB	AR-TVJT-S-PPP	-0.20455	0.0546	656	-3.748	0.0045	*
	PSP	AR - HS	AR-TVJT-S-PSP	0.04545	0.0501	656	0.908	0.9995	
		AR - SB	AR-TVJT-S-PSP	0.26515	0.0546	656	4.858	<.0001	*
		HS - SB	AR-TVJT-S-PSP	0.21970	0.0546	656	4.025	0.0015	*
	PPD	AR - HS	AR-TVJT-S-PPD	-0.27273	0.0501	656	-5.446	<.0001	*
		AR - SB	AR-TVJT-S-PPD	0.04167	0.0546	656	0.763	0.9999	
		HS - SB	AR-TVJT-S-PPD	0.31439	0.0546	656	5.761	<.0001	*
	PPN	AR - HS	AR-TVJT-S-PPN	-0.21212	0.0501	656	-4.235	0.0006	*
		AR - SB	AR-TVJT-S-PPN	0.07197	0.0546	656	1.319	0.9740	
		HS - SB	AR-TVJT-S-PPN	0.28409	0.0546	656	5.205	<.0001	*
Resumptive Pronouns	RES	AR - HS	AR-GJT-R-RES	1.3764	0.472	Inf	2.917	0.0639	
		AR - SB	AR-GJT-R-RES	1.8869	0.518	Inf	3.646	0.0064	*
		HS - SB	AR-GJT-R-RES	0.5106	0.504	Inf	1.013	0.9872	
	GAP	AR - HS	AR-GJT-R-GAP	-2.2420	0.447	Inf	-5.013	<.0001	*
		AR - SB	AR-GJT-R-GAP	0.4562	0.487	Inf	0.937	0.9944	
		HS - SB	AR-GJT-R-GAP	2.6982	0.492	Inf	5.484	<.0001	*
Double Objects	BTH	AR - HS	AR-GJT-D-BTH	1.0210	0.468	Inf	2.184	0.3258	
		AR - SB	AR-GJT-D-BTH	-0.1810	0.529	Inf	-0.342	1.0000	
		HS - SB	AR-GJT-D-BTH	-1.2020	0.518	Inf	-2.322	0.2521	
	CAU	AR - HS	AR-GJT-D-CAU	0.7790	0.462	Inf	1.687	0.6626	
		AR - SB	AR-GJT-D-CAU	-0.2651	0.519	Inf	-0.511	1.0000	
		HS - SB	AR-GJT-D-CAU	-1.0442	0.508	Inf	-2.055	0.4052	
	ENG	AR - HS	AR-GJT-D-ENG	-2.7107	0.447	Inf	-6.060	<.0001	*
		AR - SB	AR-GJT-D-ENG	1.1537	0.496	Inf	2.324	0.2515	
		HS - SB	AR-GJT-D-ENG	3.8644	0.500	Inf	7.728	<.0001	*
	NTR	AR - HS	AR-GJT-D-NTR	-2.7370	0.447	Inf	-6.127	<.0001	*
		AR - SB	AR-GJT-D-NTR	1.3936	0.504	Inf	2.767	0.0927	
		HS - SB	AR-GJT-D-NTR	4.1306	0.505	Inf	8.186	<.0001	*
Adverb Word Order	P1G	AR - HS	AR-GJT-A-P1G	-0.4912	0.451	Inf	-1.089	0.9748	
		AR - SB	AR-GJT-A-P1G	-0.0224	0.496	Inf	-0.045	1.0000	
		HS - SB	AR-GJT-A-P1G	0.4688	0.496	Inf	0.945	0.9938	
	P2G	AR - HS	AR-GJT-A-P2G	0.8853	0.467	Inf	1.896	0.5117	
		AR - SB	AR-GJT-A-P2G	0.6636	0.513	Inf	1.294	0.9072	
		HS - SB	AR-GJT-A-P2G	-0.2217	0.503	Inf	-0.441	1.0000	
	P3G	AR - HS	AR-GJT-A-P3G	0.2426	0.443	Inf	0.548	1.0000	
		AR - SB	AR-GJT-A-P3G	1.7644	0.488	Inf	3.618	0.0074	*
		HS - SB	AR-GJT-A-P3G	1.5219	0.487	Inf	3.123	0.0354	*
	P3U	AR - HS	AR-GJT-A-P3U	-1.5488	0.439	Inf	-3.524	0.0103	*
		AR - SB	AR-GJT-A-P3U	1.4266	0.499	Inf	2.858	0.0742	
		HS - SB	AR-GJT-A-P3U	2.9754	0.498	Inf	5.970	<.0001	*
	S4U	AR - HS	AR-GJT-A-S4U	-1.7743	0.441	Inf	-4.023	0.0015	*
		AR - SB	AR-GJT-A-S4U	1.7121	0.500	Inf	3.423	0.0134	*
		HS - SB	AR-GJT-A-S4U	3.4863	0.500	Inf	6.971	<.0001	*
	V4U	AR - HS	AR-GJT-A-V4U	-1.8808	0.441	Inf	-4.262	0.0006	*
		AR - SB	AR-GJT-A-V4U	1.6349	0.505	Inf	3.237	0.0253	*
		HS - SB	AR-GJT-A-V4U	3.5157	0.505	Inf	6.964	<.0001	*

SE = standard error; df = degrees of freedom; Inf = infinite; S = significance; \* = statistically significant (p-value < 0.05)

SB = school bilinguals; HS = heritage speakers; AR = Arabic native controls

GNC = “the”, generic trait; SPC = “the”, specific trait; DEM = demonstrative, generic trait; ALL = “all”, specific trait

PPP = present prog., positive; PSP = present simple, positive; PPD = present prog., different action; PPN = present prog., negative

RES = resumptive pronoun at extraction site; GAP = gap at extraction site

BTH = DOC grammatical in both English and Arabic; CAU = causative verb

ENG = DOC grammatical in English only; NTR = DOC grammatical in neither English nor Arabic

P1G = adv. in Position 1, grammatical; P2G = adv. in Position 2, grammatical; P3G = adv. in Position 3, grammatical

P3U = adv. in Position 3, ungrammatical; S4U = adv. in Position 4, ungrammatical, SVO order.; V4U = adv. in Position 4, ungrammatical, VSO order

# APPENDIX L: PARTICIPANT MEANS BY CONDITION FOR TVJTS AND GJTS

## ENGLISH TVJT

Grp	Participant	Article Semantics				Verbal Aspect			
		BRT	THT	BRF	THF	PPP	PSN	PPN	PSP
SB	SB09	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	SB12	0.50	1.00	0.17	0.33	1.00	0.50	0.00	0.50
	SB13	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	SB14	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	SB15	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	SB16	1.00	0.83	0.00	0.00	1.00	1.00	0.00	0.00
	SB21	1.00	0.67	0.00	0.17	1.00	0.50	0.17	0.33
	SB22	0.83	1.00	0.00	0.00	1.00	0.67	0.00	0.17
	SB24	1.00	1.00	0.00	0.00	1.00	0.83	0.00	0.00
	SB26	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.17
	SB34	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.17
	SB35	1.00	1.00	0.00	0.00	1.00	0.33	0.33	0.33
	SB36	1.00	1.00	0.17	0.00	1.00	1.00	0.00	0.00
	SB37	1.00	1.00	0.00	0.00	1.00	0.83	0.17	0.00
	SB41	0.83	1.00	0.00	0.17	1.00	1.00	0.00	0.00
	SB42	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
HS	HS13	0.83	1.00	0.00	0.00	1.00	0.83	0.17	0.00
	HS14	0.67	0.83	0.33	0.17	0.83	1.00	0.33	0.33
	HS16	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	HS17	1.00	1.00	0.17	0.17	1.00	0.33	0.17	1.00
	HS18	1.00	1.00	0.00	0.00	1.00	0.83	0.00	0.00
	HS19	1.00	1.00	0.00	0.00	1.00	0.83	0.00	0.00
	HS21	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	HS22	0.83	0.83	0.17	0.00	1.00	1.00	0.00	0.17
	HS23	0.50	0.17	0.67	0.67	0.83	0.67	0.67	0.50
	HS24	0.50	0.83	0.00	1.00	1.00	0.67	0.17	0.50
	HS25	1.00	1.00	0.17	0.00	1.00	0.83	0.00	0.33
	HS26	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.17
	HS28	1.00	0.33	0.17	1.00	1.00	0.33	0.17	0.83
	HS31	1.00	1.00	0.00	0.00	1.00	0.33	0.00	0.00
	HS32	0.33	0.83	0.50	0.17	0.83	0.50	0.17	0.17
	HS34	1.00	0.83	0.17	0.00	1.00	1.00	0.00	0.00
	HS37	0.50	1.00	0.83	0.17	1.00	0.33	0.00	0.67
	HS39	1.00	1.00	0.17	0.00	1.00	0.83	0.00	0.00
	HS42	1.00	1.00	0.00	0.00	0.83	0.83	0.17	0.33
	HS44	1.00	1.00	0.00	0.17	1.00	1.00	0.00	0.17
	HS46	1.00	1.00	0.00	0.33	1.00	0.67	0.00	0.50
	HS48	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00

Grp = Group; HS = heritage speakers; EN = English native controls

BRT = bare plural, true; THT = “the”, true; BRF = bare plural, false; THF = “the”, false

PPP = present prog., positive; PSN = present simple, negative; PPN = present prog., negative; PSP = present simple, positive

Grp	Participant	Article Semantics				Verbal Aspect			
		BRT	THT	BRF	THF	PPP	PSN	PPN	PSP
EN	EN01	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN03	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN06	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN07	1.00	1.00	0.00	0.00	1.00	0.50	0.00	0.33
	EN08	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN10	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN11	1.00	1.00	0.17	0.17	1.00	0.17	0.00	0.67
	EN13	1.00	0.83	0.00	0.00	1.00	1.00	0.00	0.00
	EN14	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN15	1.00	1.00	0.00	0.17	1.00	0.00	0.00	1.00
	EN16	1.00	1.00	0.17	0.00	1.00	1.00	0.00	0.00
	EN18	1.00	1.00	0.00	0.00	0.83	0.50	0.00	0.17
	EN19	0.83	1.00	0.50	0.00	0.83	0.00	0.00	0.83
	EN21	1.00	1.00	0.00	0.00	1.00	0.67	0.00	0.00
	EN22	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN23	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN26	1.00	0.83	0.00	0.00	1.00	1.00	0.17	0.00
	EN30	1.00	1.00	0.00	0.00	1.00	0.83	0.00	0.00
	EN31	1.00	1.00	0.00	0.00	1.00	0.50	0.00	0.33
	EN32	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN33	1.00	1.00	0.00	0.00	1.00	0.17	0.00	0.67
	EN35	1.00	1.00	0.00	0.00	1.00	0.50	0.17	0.50
	EN36	1.00	1.00	0.00	0.17	1.00	0.67	0.00	0.00
	EN46	1.00	1.00	0.00	0.00	1.00	0.83	0.00	0.00
	EN51	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN52	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN58	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN59	1.00	1.00	0.00	0.00	1.00	0.50	0.00	0.33
	EN61	1.00	1.00	0.00	0.33	1.00	0.50	0.00	0.50
	EN62	0.67	1.00	0.00	0.00	1.00	0.67	0.00	0.17
	EN65	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00
	EN66	1.00	1.00	0.00	0.00	1.00	0.83	0.00	0.00
	EN69	1.00	1.00	0.67	0.00	1.00	0.33	0.17	1.00

Grp = Group; SB = school bilinguals; HS = heritage speakers; EN = English native controls

BRT = bare plural, true; THT = “the”, true; BRF = bare plural, false; THF = “the”, false

PPP = present prog., positive; PSN = present simple, negative; PPN = present prog., negative; PSP = present simple, positive

# ENGLISH GJT

Grp	Ppt	Resumptive Pronouns		Double Objects				Adverb Word Order					
		GAP	RES	BTH	ENG	NTR	NNS	P1G	P2G	P4G	P1U	P2U	P3U
SB	SB09	5.83	2.17	5.83	5.67	2.67	1.17	4.83	6.00	6.00	2.17	3.50	2.50
	SB12	5.83	1.00	2.67	1.83	1.00	1.00	2.17	6.00	6.00	1.00	1.00	1.00
	SB13	5.83	3.67	5.83	4.33	1.17	1.00	5.00	6.00	6.00	1.17	1.17	1.33
	SB14	5.17	4.00	5.00	4.67	2.83	1.00	5.17	6.00	6.00	3.67	4.67	4.00
	SB15	4.83	1.00	5.67	4.50	1.00	1.00	5.17	6.00	5.83	1.17	1.17	1.33
	SB16	6.00	3.50	6.00	6.00	3.17	1.67	5.67	6.00	6.00	5.00	3.83	4.00
	SB21	5.33	3.33	5.00	4.83	3.17	1.33	4.67	5.17	5.67	2.33	4.17	4.00
	SB22	5.17	1.33	5.33	4.00	1.17	1.00	2.83	6.00	6.00	2.67	2.67	2.83
	SB24	5.83	2.50	5.67	4.33	1.33	1.00	4.83	6.00	6.00	2.00	3.17	3.00
	SB26	6.00	1.33	5.33	4.67	1.00	1.00	5.00	6.00	6.00	1.00	1.00	1.00
	SB34	6.00	1.00	5.17	4.50	1.00	1.00	5.67	6.00	6.00	1.00	1.00	1.00
	SB35	6.00	1.00	6.00	5.67	2.50	1.50	5.33	6.00	6.00	1.00	1.33	1.00
	SB36	6.00	1.00	6.00	6.00	1.00	1.00	4.67	6.00	6.00	1.00	1.00	1.00
	SB37	5.33	2.00	6.00	4.67	2.00	1.00	5.33	6.00	6.00	1.50	1.83	1.67
	SB41	5.50	1.00	5.33	4.50	1.00	1.00	4.67	5.83	6.00	1.00	1.00	1.00
	SB42	5.50	1.83	6.00	4.83	1.33	1.00	4.00	6.00	6.00	1.17	1.83	1.50
HS	HS13	4.33	1.33	5.83	6.00	2.67	1.00	4.83	5.50	6.00	1.83	3.83	1.83
	HS14	5.67	1.83	5.83	5.00	1.50	1.17	5.00	6.00	6.00	1.17	1.83	1.67
	HS16	5.67	3.00	4.67	3.33	2.33	1.33	5.83	6.00	5.83	2.67	3.00	3.00
	HS17	5.83	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
	HS18	5.83	1.33	5.50	5.33	2.00	1.00	5.33	6.00	6.00	1.83	2.33	2.50
	HS19	4.00	1.00	4.50	2.83	1.00	1.00	3.33	6.00	6.00	1.17	1.67	1.00
	HS21	5.83	4.17	5.67	5.50	3.17	1.17	6.00	6.00	5.83	4.50	4.50	4.83
	HS22	5.67	4.50	6.00	5.33	2.83	1.00	5.17	6.00	6.00	3.17	3.33	3.50
	HS23	4.00	2.83	4.50	4.17	2.83	2.50	4.33	3.50	4.17	2.83	3.83	2.33
	HS24	4.83	3.67	5.67	5.33	3.83	2.50	4.67	5.67	5.33	3.17	3.33	2.33
	HS25	6.00	3.17	6.00	5.50	2.50	1.33	5.67	6.00	6.00	3.33	3.67	3.17
	HS26	6.00	5.00	5.83	6.00	3.67	1.50	6.00	6.00	6.00	4.83	5.00	4.33
	HS28	5.50	2.50	5.17	4.17	3.67	1.67	5.17	5.67	5.83	1.33	5.00	3.83
	HS31	5.67	3.00	5.67	5.00	2.33	1.50	4.50	6.00	6.00	3.17	4.00	3.50
	HS32	5.83	3.83	5.50	5.67	4.50	3.17	4.83	6.00	5.83	4.00	5.00	4.50
	HS34	6.00	4.50	6.00	6.00	4.17	3.17	6.00	6.00	6.00	4.00	4.17	4.33
	HS37	6.00	2.00	6.00	5.83	1.33	1.00	6.00	6.00	6.00	3.33	2.83	2.33
	HS39	5.17	4.17	5.33	4.33	3.17	1.50	5.50	5.83	5.33	4.83	4.50	4.33
	HS42	5.17	2.33	5.00	4.50	2.00	1.00	4.67	4.67	4.83	3.33	5.17	2.33
	HS44	6.00	5.17	6.00	5.83	1.00	1.00	5.83	6.00	6.00	2.50	1.67	2.33
	HS46	5.83	4.33	5.50	5.33	4.17	3.17	5.67	6.00	5.83	4.50	4.50	4.50
	HS48	4.50	1.17	5.00	4.50	3.00	1.17	2.50	5.33	5.67	1.17	1.33	1.00

Grp = Group; Ppt = Participant; SB = school bilinguals; HS = heritage speakers; EN = English native controls

GAP = gap at extraction site; RES = resumptive pronoun at extraction site

BTH = DOC grammatical in both English and Arabic; ENG = DOC grammatical in English only

NTR = DOC grammatical in neither English nor Arabic; NNS = semantically nonsensical

P1G = adv. in Position 1, grammatical; P2G = adv. in Position 2, grammatical; P4G = adv. in Position 4, grammatical

P1U = adv. in Position 1, ungrammatical; P2U = adv. in Position 2, ungrammatical; P3U = adv. in Position 3, ungrammatical

Grp	Ppt	Resumptive Pronouns		Double Objects				Adverb Word Order					
		GAP	RES	BTH	ENG	NTR	NNS	P1G	P2G	P4G	P1U	P2U	P3U
EN	EN01	6.00	1.00	5.83	5.33	1.67	1.00	5.67	6.00	6.00	1.50	1.33	1.00
	EN03	5.67	2.17	6.00	5.17	2.17	1.00	5.50	6.00	6.00	2.00	2.00	2.33
	EN06	6.00	3.33	6.00	5.33	2.83	1.33	6.00	6.00	6.00	3.67	4.50	4.00
	EN07	5.83	4.17	6.00	5.83	4.00	2.33	5.83	6.00	6.00	4.83	4.67	4.50
	EN08	6.00	3.00	6.00	6.00	2.17	1.00	5.83	6.00	6.00	3.33	4.17	2.83
	EN10	6.00	4.83	6.00	5.67	4.33	3.50	5.83	6.00	6.00	4.50	5.00	4.33
	EN11	4.67	2.83	4.33	5.00	1.83	1.00	5.50	6.00	5.50	3.33	3.33	2.83
	EN13	5.50	2.83	5.33	3.83	1.83	1.00	5.50	6.00	6.00	2.17	3.00	2.00
	EN14	6.00	1.83	5.83	4.83	1.83	1.00	6.00	6.00	6.00	3.17	4.33	4.00
	EN15	5.67	2.67	6.00	6.00	1.83	1.00	5.83	6.00	6.00	2.67	3.67	2.67
	EN16	5.17	3.50	5.83	5.83	3.33	1.67	5.50	6.00	6.00	2.83	3.83	3.33
	EN18	5.67	2.83	6.00	5.83	2.83	2.00	6.00	6.00	6.00	3.33	3.33	3.00
	EN19	6.00	3.83	6.00	5.67	2.33	1.00	6.00	6.00	6.00	4.00	4.67	3.67
	EN21	6.00	1.67	5.83	5.17	1.00	1.00	4.33	6.00	6.00	1.33	1.33	1.33
	EN22	6.00	4.00	6.00	6.00	2.67	1.33	6.00	6.00	6.00	4.00	4.00	4.00
	EN23	6.00	2.50	6.00	5.33	2.17	1.00	6.00	6.00	6.00	3.50	4.83	4.17
	EN26	5.67	1.67	6.00	5.00	2.67	1.00	5.50	5.67	5.83	3.00	3.00	2.50
	EN30	5.33	1.00	6.00	5.67	2.67	1.00	5.50	6.00	6.00	2.83	3.67	3.00
	EN31	6.00	1.67	6.00	5.83	2.17	1.00	5.83	6.00	6.00	2.17	2.50	2.67
	EN32	6.00	3.00	6.00	5.50	2.83	1.00	5.33	6.00	6.00	2.67	3.00	3.00
	EN33	6.00	3.83	6.00	5.83	3.00	1.17	5.83	6.00	6.00	4.00	4.00	4.00
	EN35	6.00	1.67	6.00	6.00	1.67	1.00	6.00	6.00	6.00	2.33	2.83	2.33
	EN36	6.00	3.50	6.00	5.67	3.67	1.33	6.00	6.00	6.00	3.33	3.67	3.17
	EN46	6.00	1.33	5.17	4.00	1.33	1.00	6.00	6.00	5.67	1.67	2.00	2.00
	EN51	6.00	2.17	5.83	5.00	1.50	1.00	5.83	6.00	6.00	2.00	2.17	2.00
	EN52	5.00	2.33	4.83	4.33	2.67	1.00	4.50	6.00	5.50	3.33	3.83	3.17
	EN58	6.00	2.00	6.00	4.83	2.17	1.00	6.00	6.00	6.00	2.00	2.00	2.00
	EN59	5.83	2.83	5.83	5.33	3.33	1.00	5.67	5.50	5.67	2.50	3.83	3.33
	EN61	6.00	3.50	5.33	5.17	3.50	2.67	5.33	6.00	6.00	3.83	3.83	4.50
	EN62	6.00	3.17	6.00	5.33	2.33	1.00	5.83	6.00	6.00	3.50	3.83	2.83
	EN65	5.67	3.17	6.00	6.00	3.17	1.33	5.50	6.00	6.00	3.00	3.00	2.83
	EN66	5.83	2.83	5.67	5.00	3.00	1.83	5.17	6.00	6.00	4.00	4.00	4.00
	EN69	4.83	4.33	5.00	4.83	4.33	3.50	4.83	5.17	4.83	4.00	4.50	4.00

Grp = Group; Ppt = Participant; SB = school bilinguals; HS = heritage speakers; EN = English native controls

GAP = gap at extraction site; RES = resumptive pronoun at extraction site

BTH = DOC grammatical in both English and Arabic; ENG = DOC grammatical in English only

NTR = DOC grammatical in neither English nor Arabic; NNS = semantically nonsensical

P1G = adv. in Position 1, grammatical; P2G = adv. in Position 2, grammatical; P4G = adv. in Position 4, grammatical

P1U = adv. in Position 1, ungrammatical; P2U = adv. in Position 2, ungrammatical; P3U = adv. in Position 3, ungrammatical

# ARABIC TVJT

Grp	Participant	Article Semantics				Verbal Aspect			
		GNC	SPC	ALL	DEM	PPP	PSP	PPD	PPN
SB	SB09	1.00	0.33	0.00	0.00	1.00	0.83	0.17	0.17
	SB12	0.67	0.67	0.00	0.00	1.00	0.00	0.00	0.00
	SB13	1.00	0.00	0.00	0.17	1.00	0.00	0.00	0.17
	SB14	0.83	0.17	0.00	0.00	1.00	0.00	0.00	0.00
	SB15	0.17	0.83	0.17	0.00	1.00	0.17	0.00	0.00
	SB16	1.00	0.17	0.00	0.00	1.00	0.17	0.00	0.00
	SB21	1.00	0.00	0.00	0.00	1.00	0.67	0.00	0.17
	SB22	0.33	0.50	0.00	0.00	1.00	1.00	0.00	0.00
	SB24	0.50	0.83	0.00	0.00	1.00	0.83	0.00	0.00
	SB26	1.00	0.17	0.00	0.00	1.00	1.00	0.00	0.00
	SB34	0.83	0.17	0.00	0.17	1.00	0.00	0.00	0.00
	SB35	0.67	0.50	0.00	0.00	1.00	0.83	0.00	0.00
	SB36	1.00	0.17	0.00	0.17	1.00	0.00	0.00	0.00
	SB37	1.00	0.00	0.00	0.00	1.00	0.50	0.00	0.17
HS	SB41	0.33	0.67	0.00	0.00	1.00	0.17	0.17	0.00
	SB42	1.00	0.17	0.00	0.00	1.00	0.50	0.33	0.00
	HS13	0.33	0.50	0.00	0.33	1.00	0.83	0.33	0.50
	HS14	0.67	0.50	0.67	0.17	0.67	0.67	0.50	0.50
	HS16	1.00	0.83	0.00	0.00	1.00	0.67	0.00	0.17
	HS17	0.83	0.50	0.00	0.17	1.00	1.00	0.67	0.67
	HS18	0.67	0.00	0.00	0.00	1.00	0.17	0.50	0.00
	HS19	0.50	1.00	0.17	0.50	0.50	0.83	0.50	0.50
	HS21	1.00	0.00	0.00	0.00	1.00	0.00	0.50	0.17
	HS22	0.17	0.67	0.17	0.17	0.17	0.17	0.67	0.83
	HS23	0.83	0.17	0.17	0.00	1.00	1.00	0.17	0.00
	HS24	0.33	0.50	0.83	0.33	1.00	0.17	0.33	0.50
	HS25	0.50	1.00	0.00	0.00	0.83	1.00	0.17	0.00
	HS26	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
AR	HS28	0.50	0.33	0.50	0.17	0.50	0.33	0.50	0.67
	HS31	0.67	0.33	0.00	0.00	1.00	0.50	0.00	0.17
	HS32	0.67	0.50	0.67	0.83	0.33	0.67	1.00	0.33
	HS34	0.83	0.33	0.00	0.00	1.00	0.83	0.50	0.33
	HS37	0.00	1.00	0.00	0.00	1.00	1.00	0.17	0.00
	HS39	0.17	1.00	0.33	0.17	1.00	1.00	0.17	0.00
	HS42	0.67	0.17	0.00	0.00	0.50	1.00	0.50	0.17
	HS44	0.00	1.00	0.00	0.17	0.17	0.50	0.00	1.00
	HS46	0.17	1.00	0.00	0.00	1.00	1.00	0.33	0.00
	HS48	0.33	0.67	0.33	0.33	0.83	0.67	0.33	0.67
	AR02	0.17	1.00	0.00	0.00	0.83	0.17	0.00	0.67
	AR05	0.83	0.00	0.00	0.00	1.00	0.50	0.17	0.00
	AR06	0.33	0.17	0.00	0.00	1.00	0.67	0.17	0.50
	AR07	0.83	0.50	0.33	0.00	0.83	1.00	0.17	0.00
	AR08	0.83	0.17	0.00	0.17	1.00	1.00	0.00	0.00
	AR09	1.00	0.00	0.00	0.00	1.00	0.33	0.00	0.00
	AR11	1.00	0.17	0.00	0.00	1.00	0.50	0.00	0.00
	AR12	1.00	0.00	0.17	0.17	0.83	0.83	0.17	0.17
	AR13	1.00	0.17	0.00	0.00	1.00	0.83	0.17	0.00
	AR14	1.00	0.00	0.00	0.33	1.00	0.67	0.00	0.00
	AR15	0.83	0.17	0.17	0.00	1.00	0.00	0.17	0.00
	AR17	1.00	0.00	0.00	0.00	1.00	0.00	0.17	0.17
	AR18	0.17	0.83	0.00	0.00	1.00	1.00	0.00	0.00
	AR19	0.83	0.00	0.00	0.00	1.00	0.33	0.00	0.17
	AR20	0.33	0.83	0.00	0.00	1.00	0.67	0.00	0.17
	AR21	1.00	0.00	0.17	0.00	1.00	1.00	0.00	0.00
	AR22	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.17
	AR23	0.83	0.67	0.83	1.00	0.83	0.83	0.67	0.33
	AR24	1.00	0.00	0.00	0.17	1.00	1.00	0.00	0.00
	AR25	0.83	0.17	0.00	0.17	1.00	0.67	0.00	0.17
	AR26	0.83	0.00	0.00	0.33	1.00	1.00	0.00	0.00
	AR28	0.50	0.50	0.00	0.00	1.00	1.00	0.00	0.00

Grp = Group; SB = school bilinguals; HS = heritage speakers; AR = Arabic native controls

GNC = “the”, generic trait; SPC = “the”, specific trait; DEM = demonstrative, generic trait; ALL = “all”, specific trait

PPP = present prog., positive; PSP = present simple, positive; PPD = present prog., different action; PPN = present prog., negative

## ARABIC GJT

Grp	Ppt	Resumptive Pronouns		Double Objects				Adverb Word Order					
		RES	GAP	BTH	CAU	ENG	NTR	P1G	P2G	P3G	P3U	S4U	V4U
SB	SB09	6.00	2.83	6.00	5.33	2.33	2.00	4.50	5.67	3.83	2.50	2.50	1.83
	SB12	3.33	1.00	2.17	3.50	1.50	1.67	3.33	2.83	1.50	1.00	1.00	1.00
	SB13	6.00	3.83	5.83	5.83	1.50	1.83	5.67	5.17	3.83	1.33	1.33	1.33
	SB14	5.67	4.33	5.00	4.33	3.17	3.83	5.00	6.00	5.17	3.50	3.67	2.83
	SB15	5.17	1.83	6.00	5.33	2.17	1.00	5.17	6.00	3.67	1.00	1.00	1.00
	SB16	5.67	5.00	5.83	5.67	4.67	3.83	5.67	6.00	5.17	3.67	3.83	3.33
	SB21	5.33	3.83	5.33	4.17	2.17	1.83	3.67	6.00	5.17	1.00	1.00	1.00
	SB22	4.67	3.17	5.17	4.83	1.67	1.67	4.17	5.17	3.00	3.17	2.83	2.67
	SB24	5.33	4.00	5.67	5.50	1.33	1.33	4.67	5.67	3.33	2.17	1.83	1.67
	SB26	3.33	4.17	5.83	5.83	1.17	1.00	4.17	5.17	2.17	1.00	1.00	1.00
	SB34	2.67	6.00	6.00	5.17	2.33	1.83	5.83	5.67	2.83	1.00	1.00	1.00
	SB35	6.00	2.33	6.00	6.00	3.17	1.00	4.83	5.00	2.67	1.00	1.00	1.00
	SB36	6.00	1.00	6.00	5.17	1.83	1.00	6.00	6.00	2.33	1.00	1.00	1.00
	SB37	4.17	2.17	4.33	5.33	1.17	1.00	3.50	3.50	2.50	1.00	1.00	1.00
	SB41	1.17	2.67	5.17	5.50	1.00	1.00	3.67	3.17	2.17	1.00	1.00	1.00
	SB42	1.83	2.00	5.67	6.00	1.00	1.00	4.67	5.33	3.17	1.67	1.67	1.67
HS	HS13	3.17	4.50	5.17	4.67	4.50	4.33	5.33	6.00	3.00	2.67	3.67	3.33
	HS14	5.83	4.67	5.67	4.67	3.33	3.50	4.50	5.67	5.33	2.33	2.67	2.17
	HS16	6.00	5.50	5.67	5.33	3.83	4.17	5.67	6.00	5.00	3.17	3.17	3.17
	HS17	6.00	6.00	6.00	5.83	6.00	5.83	6.00	5.83	5.67	6.00	6.00	5.67
	HS18	4.67	3.83	3.33	3.17	3.83	3.67	4.50	4.00	2.83	2.50	2.83	2.67
	HS19	3.50	2.67	4.33	6.00	1.00	2.67	5.83	6.00	1.00	1.00	6.00	5.17
	HS21	5.33	5.17	4.67	4.33	4.83	3.83	5.17	5.00	4.50	3.00	3.00	3.17
	HS22	3.83	4.50	4.33	4.17	4.33	4.17	5.50	5.33	4.00	4.67	3.33	3.67
	HS23	4.33	3.83	4.67	3.83	3.67	2.67	3.67	4.67	4.50	1.00	1.17	1.00
	HS24	3.83	3.17	3.67	3.67	3.50	3.83	3.17	3.67	3.83	3.50	3.17	4.00
	HS25	6.00	6.00	5.83	6.00	5.67	4.67	5.83	6.00	5.33	5.00	5.33	5.17
	HS26	6.00	6.00	5.33	6.00	5.83	5.67	5.00	5.33	5.33	5.17	4.83	4.83
	HS28	3.83	3.50	3.33	4.33	3.67	4.17	3.67	4.33	3.67	3.67	3.83	3.50
	HS31	5.00	4.83	5.00	5.33	2.67	2.33	4.33	5.00	3.67	3.00	3.00	3.17
	HS32	5.67	5.33	5.50	5.00	5.33	5.00	5.50	5.17	5.50	4.83	4.83	4.17
	HS34	5.67	5.50	5.50	5.17	5.67	5.67	6.00	5.67	4.67	4.33	4.33	4.33
	HS37	5.67	4.67	5.33	5.00	4.83	4.83	4.17	6.00	5.33	3.17	3.50	2.33
	HS39	4.67	5.00	5.67	4.83	3.33	3.83	5.00	4.33	4.67	3.00	3.50	3.00
	HS42	5.00	4.33	5.17	4.67	5.00	3.83	4.67	5.17	4.17	3.00	3.33	3.17
	HS44	5.67	5.83	4.67	4.67	4.33	3.00	4.83	3.00	2.67	1.83	3.33	2.17
	HS46	5.50	6.00	5.50	5.50	4.50	4.50	4.17	5.50	4.83	3.00	3.00	3.00
	HS48	3.33	4.17	4.00	4.50	4.00	3.33	4.00	3.67	3.83	3.17	3.33	3.67
AR	AR02	6.00	4.17	5.67	5.83	3.50	3.33	5.17	5.33	5.00	3.83	3.17	3.17
	AR05	6.00	4.00	5.67	6.00	3.33	2.83	5.17	6.00	4.50	3.00	3.00	3.00
	AR06	5.67	2.67	4.67	4.33	1.83	2.17	5.33	5.33	4.33	3.17	2.83	2.83
	AR07	4.83	2.17	3.83	3.33	1.00	1.00	3.50	4.67	4.33	1.00	1.00	1.00
	AR08	5.50	3.50	5.50	5.50	3.67	2.50	4.17	5.67	4.00	2.33	2.17	1.83
	AR09	6.00	1.00	6.00	6.00	1.17	1.83	5.17	5.67	4.67	1.00	1.00	1.00
	AR11	6.00	6.00	5.67	5.50	3.50	3.17	4.17	5.00	4.00	1.83	2.00	1.33
	AR12	6.00	6.00	6.00	5.83	4.33	4.17	5.33	5.83	5.17	3.67	3.00	3.50
	AR13	6.00	4.50	6.00	6.00	3.17	2.17	5.00	5.17	4.50	3.50	3.67	3.33
	AR14	4.50	3.00	4.00	4.00	1.50	1.00	3.67	4.50	2.17	1.33	3.00	1.83
	AR15	5.67	2.00	5.83	5.33	1.50	1.83	4.83	5.00	4.67	1.00	5.33	4.17
	AR17	6.00	3.67	6.00	6.00	3.67	3.50	5.33	6.00	5.17	3.17	3.17	3.00
	AR18	6.00	5.00	5.33	4.50	4.17	4.17	5.67	6.00	5.00	2.67	2.50	2.67
	AR19	6.00	2.83	6.00	5.17	2.67	2.50	5.17	6.00	4.67	3.00	2.83	2.67
	AR20	6.00	4.00	5.33	5.50	2.00	1.50	4.67	6.00	4.00	2.17	2.00	2.00
	AR21	5.83	1.50	6.00	6.00	1.50	1.17	3.17	5.50	4.50	1.00	1.00	1.00
	AR22	4.00	2.00	3.17	2.67	1.83	1.50	2.50	5.17	2.33	1.33	1.17	1.00
	AR23	4.33	3.17	5.00	4.83	2.67	2.50	4.50	5.00	5.17	2.83	3.33	2.67
	AR24	6.00	3.50	6.00	5.33	1.00	1.17	5.67	6.00	6.00	1.00	1.50	1.00
	AR25	5.83	3.67	6.00	5.83	3.00	3.17	4.33	5.67	5.67	3.00	2.83	2.17
	AR26	4.83	3.17	4.00	3.67	2.17	1.83	4.17	4.83	4.67	2.17	2.33	2.00
	AR28	6.00	3.00	6.00	5.00	1.50	1.33	4.83	6.00	4.83	2.33	2.00	1.83

Grp = Group; Ppt = Participant; SB = school bilinguals; HS = heritage speakers; AR = Arabic native controls

RES = resumptive pronoun at extraction site; GAP = gap at extraction site

BTH = DOC grammatical in both English and Arabic; CAU = causative verb

ENG = DOC grammatical in English only; NTR = DOC grammatical in neither English nor Arabic

P1G = adv. in Position 1, grammatical; P2G = adv. in Position 2, grammatical; P3G = adv. in Position 3, grammatical

P3U = adv. in Position 3, ungrammatical; S4U = adv. in Position 4, ungrammatical, SVO order.; V4U = adv. in Position 4, ungrammatical, VSO order

## APPENDIX M: CONSENT FORMS

*Four versions of the consent form were used, depending on the group to which a participant belonged, and whether or not the participant was located in the European Union or the European Economic Area, in which case the consent form included a General Data Protection Regulation (GDPR) notice and consent, which was not included for participants that were not located in the European Union or the European Economic Area. The forms used for the school bilinguals and the heritage speakers specified an approximate study duration of three hours and indicated a compensation amount of \$40, while the forms used for the native control groups specified an approximate study duration of one hour and 45 minutes and a compensation amount of \$20.*

### SCHOOL BILINGUALS AND HERITAGE SPEAKERS – NON-GDPR

University of Illinois  
at Urbana-Champaign

Department of Linguistics

School of Literatures, Cultures, and Linguistics  
4080 Foreign Languages Building, MC-168  
707 South Matthews Avenue  
Urbana, IL 61801-3625 USA

### CONSENT FOR PARTICIPATION IN A RESEARCH PROJECT

You are invited to participate in a voluntary research study. The purpose of the study is to investigate the English and/or Arabic proficiency of different groups of people. The tasks you will complete will be in English or Arabic; you will be asked to complete a linguistic questionnaire about your language background and experience, and some or all of the following tasks: learning features of artificial languages and answering multiple choice questions based on what you learned, telling stories using pictures presented to you, repeating sentences spoken to you, naming pictures presented to you, rating sentences on how natural you find them, deciding if certain statements are true in certain contexts, and answering fill-in-the-blank questions. The experiment will last approximately three hours, and will take place at a time and location convenient to you. There is no risk in participating in this research beyond that encountered in everyday life. Your participation may not benefit you directly, but we hope the results will help us gain a better understanding of how people learn a second language.

This study is being conducted by Dr. Silvina Montrul, professor of Linguistics at the University of Illinois and Elias Shakkour, graduate student in Linguistics. You are being asked to participate in this experiment because you are a native speaker of English or Arabic; a speaker of Arabic as a first language and English as a second language; or a speaker of Arabic as a family language that is not the societal language, and English as a dominant language. You must be at least 18 years old to participate in this study. Your responses will consist of written responses or multiple-choice selections for all activities except for the following: telling stories using pictures



presented to you, repeating sentences spoken to you, and naming pictures presented to you. For these three activities, your responses will consist of one or more audio files submitted by you. All responses will be treated confidentially and stored in a secure location.

The questionnaire and the tasks will be presented on a computer screen.

Faculty, students, and staff who may see your information will maintain confidentiality to the extent of laws and university policies. Personal identifiers will not be published or presented. After the experiment is completed, all the test responses will be entered into an electronic database and analyzed and the results will be published. Your name and identity will not be included in the database nor in the published results. The researchers will keep the information you provide confidential. However, the service hosting a computerized survey may have access to the data you submit and to the IP number of the computer on which you complete the task. We cannot guarantee that this service will keep the information you submit confidential. You will not need to put your name on any of the test screens: you will be assigned a subject number to use instead.

You will be compensated \$40 for participating in this experiment.

Your information will not be used for future research without additional explicit informed consent.

You are free to refuse to participate or to stop participating at any time with no penalty. If you have decided to participate, your identity will be kept confidential, and you will remain anonymous in any reports of the work.

If you have any questions or would like to find out later about the results of the study, you can contact Dr. Silvina Montrul at +1-217-333-1780, [montrul@illinois.edu](mailto:montrul@illinois.edu), or the address given above. If you have questions about your rights as a participant in this research, you can contact the University of Illinois Institutional Review Board at +1-217-333-2670 or [irb@illinois.edu](mailto:irb@illinois.edu).

UIUC students and affiliates: Your decision to participate, decline, or withdraw from participation will have no effect on your current status or future relations with the University of Illinois.

Please print a copy of this consent form for your records, if you so desire.

University of Illinois  
at Urbana-Champaign

جامعة إلينوي  
في أوربانا شامبين

Department of Linguistics

School of Literatures, Cultures, and Linguistics

### موافقة على الاشتراك في بحث علمي

ندعوك للاشتراك اختياريًا في بحث علمي يتمحور على القدرات اللغوية في الإنجليزية والعربية لدى مجموعات مختلفة من الناس. تحتوي التجربة على عدد من المهام باللغة الإنجليزية أو العربية، حيث سنطلب منك ملء استفتاء لغوي يتناول خلفيتك اللغوية وتجاربك المتعلقة باللغات، وإنجاز بعض المهام التالية أو كلها: تعلم بعض خاصيات لغات مصطنعة والإجابة عن أسئلة متعلقة بما تعلمت حيث ستختار من بين عدد من الاختيارات، سرد قصص استعانةً بصور تُقدّم لك، إعادة جمل تُقال لك، تسمية صور تُقدّم لك، تحديد مدى طبيعية مجموعة من الجمل، تحديد صحة محتوى جمل معينة في سياقات معينة، الإجابة عن أسئلة ملء الفراغ. ستستغرق التجربة حوالي ثلاث ساعات وستجرى في وقت ومكان يناسبك. لا يشكل الاشتراك في هذا البحث أي خطر لا تشكّله الحياة اليومية. إن اشتراكك في البحث قد لا يفيدك بشكل مباشر، ولكننا على أمل أن تساعدنا النتائج على تحسين فهمنا لكيفية تعلم اللغات الثانية.

يقوم بهذا البحث كل من الدكتورة سلفينا مونترول، أستاذة اللغويات في جامعة إلينوي وإلياس شقور، طالب الدراسات العليا في قسم اللغويات. نطلب اشتراكك في هذه التجربة لأنك تنتمي إلى إحدى الفئات التالية: الناطقين بالإنجليزية أو العربية كاللغة الأم؛ الناطقين بالعربية كلغة أولى والإنجليزية كلغة ثانية؛ الناطقين بالعربية كلغة الأسرة المختلفة عن لغة المجتمع وبالإنجليزية كاللغة الأقوى. على كل مشترك في هذا البحث أن يكون قد بلغ السن الثامن عشر من العمر. ستقوم بالإجابة عن طريق صياغة إجابات مكتوبة أو تحديد اختيارات من بين عدد من الاختيارات في جميع أجزاء التجربة ما عدا الأجزاء التالية: سرد قصص استعانةً بصور تُقدّم لك، إعادة جمل تُقال لك، تسمية صور تُقدّم لك، حيث ستكون إجاباتك في هذه الأجزاء الثلاثة عبارة عن ملف صوتي أو أكثر تقوم بتسليمه. ستعامل كل الإجابات بسريّة وسيتم تخزينها في مكان آمن.

سيُقدّم الاستفتاء والمهام على شاشة الحاسوب.

سيقوم كل الأساتذة والطلاب والموظفين الذين يتعاملون مع بياناتك بالمحافظة على سريّتها وفقًا للقانون وسياسات الجامعة، ولن يتم نشر أية تفاصيل شخصية أو الإفصاح عنها. بعد انتهاء التجربة سنُدخل كل الإجابات إلى قاعدة بيانات إلكترونية ومن ثم سيتم تحليلها وبعد ذلك نشر النتائج. لن يُدخّل اسمك أو هويتك إلى قاعدة البيانات ولن ينشرا مع النتائج. سيحافظ الباحثون على سريّة المعلومات التي تزودنا بها. ولكن البرنامج الحاسوبي المستخدم لإجراء استفتاء قد يصل إلى البيانات التي تقدمها وإلى رقم الآي بي (بروتوكول الإنترنت) الخاص بالحاسوب المستخدم للقيام بالمهام فلا يمكننا أن نضمن لك أن يحافظ البرنامج على سريّة معلوماتك. لن تُجبر على وضع اسمك على شاشات الأسئلة بل سنعطيك رقم مشترك لتستخدمه عوضًا عن اسمك.

ستحصل على أربعين دولارًا أمريكيًا مقابل اشتراكك في هذه التجربة.

لن تُستخدم بياناتك في أبحاث مستقبلية دون إعلامك بتفاصيل البحث والحصول على موافقتك الصريحة مجددًا.

بإمكانك رفض الاشتراك أو التوقّف عن الاشتراك في أي وقت ودون أي جزاء. إذا قررت أن تشترك فسيتم الحفاظ على سريّة هويتك ولن نكشف عنها في أي تقارير متعلقة بهذا البحث.

إذا كانت لديك أية أسئلة أو إذا رغبت في معرفة نتائج البحث فبإمكانك الاتصال بالدكتورة سلفينا مونترول على رقم هاتف ١٧٨٠-٣٣٣-٢١٧+ أو عن طريق عنوان البريد الإلكتروني [montrul@illinois.edu](mailto:montrul@illinois.edu) أو عن طريق العنوان البريدي الموجود أعلاه. وإذا كانت لديك أية أسئلة عن حقوقك كمشارك في هذا البحث فبإمكانك الاتصال بمجلس المراجعة المؤسسي في جامعة إلينوي على رقم هاتف ٢٦٧-٣٣٣-٢١٧+ أو عن طريق عنوان البريد الإلكتروني [irb@illinois.edu](mailto:irb@illinois.edu).

ملاحظة لطلاب جامعة إلينوي في أوربانا شامبين وكل التابعين لها: قرارك أن تشترك في هذا البحث أو أن ترفض الاشتراك فيه أو أن تنسحب منه لن يؤثر على وضعك الحالي أو علاقاتك المستقبلية مع جامعة إلينوي.

الرجاء طباعة نسخة عن نموذج الموافقة هذا إذا رغبت في ذلك.

Name, First and Last / الاسم الثنائي

---

Date / التاريخ

---

- ☐ I have read and understand the above consent form. I certify that I am 18 years old or older and, by clicking the button below, I indicate my willingness to voluntarily take part in the study.
- أقر بأنني قد قرأت وفهمت ما ورد في نموذج الموافقة هذا. أشهد بأنني قد بلغت السن الثامن عشر من العمر وبنقري للزر أدناه أعبّر عن موافقتي على المشاركة في هذا البحث اختياريًا.

University of Illinois at Urbana-Champaign  
Institutional Review Board

Determination Date October 14, 2019  
Closure Date May 1, 2024  
IRB #19707

SCHOOL BILINGUALS AND HERITAGE SPEAKERS – GDPR

University of Illinois  
at Urbana-Champaign

Department of Linguistics

School of Literatures, Cultures, and Linguistics  
4080 Foreign Languages Building, MC-168  
707 South Matthews Avenue  
Urbana, IL 61801-3625 USA

### CONSENT FOR PARTICIPATION IN A RESEARCH PROJECT

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This study is being conducted by Dr. Silvina Montrul, professor of Linguistics at the University of Illinois and Elias Shakkour, graduate student in Linguistics. You are being asked to participate in this experiment because you are a native speaker of English or Arabic; a speaker of Arabic as a first language and English as a second language; or a speaker of Arabic as a family language that is not the societal language, and English as a dominant language. You must be at least 18 years old to participate in this study. Your responses will consist of written responses or multiple-choice selections for all activities except for the following: telling stories using pictures presented to you, repeating sentences spoken to you, and naming pictures presented to you. For these three activities, your responses will consist of one or more audio files submitted by you. All responses will be treated confidentially and stored in a secure location.

The questionnaire and the tasks will be presented on a computer screen.

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You will be compensated \$40 for participating in this experiment.

Your information will not be used for future research without additional explicit informed consent.

You are free to refuse to participate or to stop participating at any time with no penalty. If you have decided to participate, your identity will be kept confidential, and you will remain anonymous in any reports of the work.

If you have any questions or would like to find out later about the results of the study, you can contact Dr. Silvina Montrul at +1-217-333-1780, [montrul@illinois.edu](mailto:montrul@illinois.edu), or the address given above. If you have questions about your rights as a participant in this research, you can contact the University of Illinois Institutional Review Board at +1-217-333-2670 or [irb@illinois.edu](mailto:irb@illinois.edu).

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موافقة على الاشتراك في بحث علمي

ندعوك للاشتراك اختياريًا في بحث علمي يتمحور على القدرات اللغوية في الإنجليزية والعربية لدى مجموعات مختلفة من الناس. تحتوي التجربة على عدد من المهام باللغة الإنجليزية أو العربية، حيث سنطلب منك ملء استفتاء لغوي يتناول خلفيتك اللغوية وتجاربك المتعلقة باللغات، وإنجاز بعض المهام التالية أو كلها: تعلم بعض خاصيات لغات مصطنعة والإجابة عن أسئلة متعلقة بما تعلمت حيث ستختار من بين عدد من الاختيارات، سرد قصص استعانةً بصور تُقدّم لك، إعادة جمل تُقال لك، تسمية صور تُقدّم لك، تحديد مدى طبيعية مجموعة من الجمل، تحديد صحة محتوى جمل معينة في سياقات معينة، الإجابة عن أسئلة ملء الفراغ. ستستغرق التجربة حوالي ثلاث ساعات وستجرى في وقت ومكان يناسبك. لا يشكل الاشتراك في هذا البحث أي خطر لا تشكّله الحياة اليومية. إن اشتراكك في البحث قد لا يفيدك بشكل مباشر، ولكننا على أمل أن تساعدنا النتائج على تحسين فهمنا لكيفية تعلم اللغات الثانية.

يقوم بهذا البحث كل من الدكتورة سلفينا مونترول، أستاذة اللغويات في جامعة إلينوي وإلياس شقور، طالب الدراسات العليا في قسم اللغويات. نطلب اشتراكك في هذه التجربة لأنك تنتمي إلى إحدى الفئات التالية: الناطقين بالإنجليزية أو العربية كاللغة الأم؛ الناطقين بالعربية كلغة أولى والإنجليزية كلغة ثانية؛ الناطقين بالعربية كلغة الأسرة المختلفة عن لغة المجتمع وبالإنجليزية كاللغة الأقوى. على كل مشترك في هذا البحث أن يكون قد بلغ السن الثامن عشر من العمر. ستقوم بالإجابة عن طريق صياغة إجابات مكتوبة أو تحديد اختيارات من بين عدد من الاختيارات في جميع أجزاء التجربة ما عدا الأجزاء التالية: سرد قصص استعانةً بصور تُقدّم لك، إعادة جمل تُقال لك، تسمية صور تُقدّم لك، حيث ستكون إجاباتك في هذه الأجزاء الثلاثة عبارة عن ملف صوتي أو أكثر تقوم بتسليمه. سنعامل كل الإجابات بسريّة وسيتم تخزينها في مكان آمن.

سيُقدّم الاستفتاء والمهام على شاشة الحاسوب.

سيقوم كل الأساتذة والطلاب والموظفين الذين يتعاملون مع بياناتك بالمحافظة على سريتها وفقًا للقانون وسياسات الجامعة، ولن يتم نشر أية تفاصيل شخصية أو الإفصاح عنها. بعد انتهاء التجربة سنُدخل كل الإجابات إلى قاعدة بيانات إلكترونية ومن ثم سيتم تحليلها وبعد ذلك نشر النتائج. لن يُدخّل اسمك أو هويتك إلى قاعدة البيانات ولن ينشر مع النتائج. سيحافظ الباحثون على سريّة المعلومات التي تزودنا بها. ولكن البرنامج الحاسوبي المستخدم لإجراء استفتاء قد يصل إلى البيانات التي تقدمها وإلى رقم الآي.بي (بروتوكول الإنترنت) الخاص بالحاسوب المستخدم للقيام بالمهام فلا يمكننا أن نضمن لك أن يحافظ البرنامج على سريّة معلوماتك. لن تُجبر على وضع اسمك على شاشات الأسئلة بل سنعطيك رقم مشترك لتستخدمه عوضًا عن اسمك.

ستحصل على أربعين دولارًا أمريكيًا مقابل اشتراكك في هذه التجربة.

لن تُستخدم بياناتك في أبحاث مستقبلية دون إعلامك بتفاصيل البحث والحصول على موافقتك الصريحة مجددًا.

بإمكانك رفض الاشتراك أو التوقف عن الاشتراك في أي وقت ودون أي جزاء. إذا قررت أن تشترك فسيتم الحفاظ على سريّة هويتك ولن نكشف عنها في أي تقارير متعلقة بهذا البحث.

إذا كانت لديك أية أسئلة أو إذا رغبت في معرفة نتائج البحث فبإمكانك الاتصال بالدكتورة سلفينا مونترول على رقم هاتف ١٧٨٠-٣٣٣-٢١٧+ أو عن طريق عنوان البريد الإلكتروني [montrul@illinois.edu](mailto:montrul@illinois.edu) أو عن طريق العنوان البريدي الموجود أعلاه. وإذا كانت لديك أية أسئلة عن حقوقك كمشارك في هذا البحث فبإمكانك الاتصال بمجلس المراجعة المؤسسي في جامعة إلينوي على رقم هاتف ٢٦٧-٣٣٣-٢١٧+ أو عن طريق عنوان البريد الإلكتروني [irb@illinois.edu](mailto:irb@illinois.edu).

ملاحظة لطلاب جامعة إلينوي في أوربانا شامبين وكل التابعين لها: قرارك أن تشارك في هذا البحث أو أن ترفض الاشتراك فيه أو أن تنسحب منه لن يؤثر على وضعك الحالي أو علاقتك المستقبلية مع جامعة إلينوي.

الرجاء طباعة نسخة عن نموذج الموافقة هذا إذا رغبت في ذلك.

## **General Data Protection Regulation (GDPR) Notice/Consent**

The University of Illinois [Web Privacy Notice](#) and [Supplemental Privacy Notice for certain persons in the European Economic Area](#) describe in detail how the University processes personal information.

### **إشعار وموافقة بخصوص النظام الأوروبي العام لحماية البيانات**

إن الإشعار حول خصوصية البيانات على الإنترنت والإشعار الإضافي حول خصوصية بعض الأشخاص الموجودين في المنطقة الاقتصادية الأوروبية، والصادر عن جامعة إلينوي، يصفان بدقة طريقة معالجة الجامعة للبيانات الشخصية.

- ☐ I consent to the processing of my personal information for the purpose of research as set forth in this online Consent Notice. I understand that I may withdraw my consent at any time, but doing so will not affect the processing of my personal information before my withdrawal of consent.

أوافق على معالجة بياناتي الشخصية بغرض إجراء الأبحاث وقف ما قد ورد في إشعار الموافقة هذا الموجود على الإنترنت. قد فهمت أنه يحق لي سحب موافقتي في أي وقت، وأن ذلك لن يؤثر على معالجة بياناتي الشخصية قبل سحبي للموافقة.

Name, First and Last / الاسم الثنائي

Date / التاريخ

- ☐ I have read and understand the above consent form. I certify that I am 18 years old or older and, by clicking the button below, I indicate my willingness to voluntarily take part in the study.

أقر بأنني قد قرأت وفهمت ما ورد في نموذج الموافقة هذا. أشهد بأنني قد بلغت السن الثامن عشر من العمر وبنفري للزr أدناه أعبّر عن موافقتي على المشاركة في هذا البحث اختياريا.

University of Illinois at Urbana-Champaign  
Institutional Review Board

Determination Date October 14, 2019  
Closure Date May 1, 2024  
IRB #19707

## NATIVE CONTROL GROUPS – NON-GDPR

University of Illinois  
at Urbana-Champaign

Department of Linguistics

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707 South Matthews Avenue  
Urbana, IL 61801-3625 USA

### CONSENT FOR PARTICIPATION IN A RESEARCH PROJECT

You are invited to participate in a voluntary research study. The purpose of the study is to investigate the English and/or Arabic proficiency of different groups of people. The tasks you will complete will be in English or Arabic; you will be asked to complete a linguistic questionnaire about your language background and experience, and some or all of the following tasks: learning features of artificial languages and answering multiple choice questions based on what you learned, telling stories using pictures presented to you, repeating sentences spoken to you, naming pictures presented to you, rating sentences on how natural you find them, deciding if certain statements are true in certain contexts, and answering fill-in-the-blank questions. The experiment will last approximately one hour and 45 minutes, and will take place at a time and location convenient to you. There is no risk in participating in this research beyond that encountered in everyday life. Your participation may not benefit you directly, but we hope the results will help us gain a better understanding of how people learn a second language.

This study is being conducted by Dr. Silvina Montrul, professor of Linguistics at the University of Illinois and Elias Shakkour, graduate student in Linguistics. You are being asked to participate in this experiment because you are a native speaker of English or Arabic; a speaker of Arabic as a first language and English as a second language; or a speaker of Arabic as a family language that is not the societal language, and English as a dominant language. You must be at least 18 years old to participate in this study. Your responses will consist of written responses or multiple-choice selections for all activities except for the following: telling stories using pictures presented to you, repeating sentences spoken to you, and naming pictures presented to you. For these three activities, your responses will consist of one or more audio files submitted by you. All responses will be treated confidentially and stored in a secure location.

The questionnaire and the tasks will be presented on a computer screen.

Faculty, students, and staff who may see your information will maintain confidentiality to the extent of laws and university policies. Personal identifiers will not be published or presented. After the experiment is completed, all the test responses will be entered into an electronic database and analyzed and the results will be published. Your name and identity will not be included in the database nor in the published results. The researchers will keep the information you provide confidential. However, the service hosting a computerized survey may have access



to the data you submit and to the IP number of the computer on which you complete the task. We cannot guarantee that this service will keep the information you submit confidential. You will not need to put your name on any of the test screens: you will be assigned a subject number to use instead.

You will be compensated \$20 for participating in this experiment.

Your information will not be used for future research without additional explicit informed consent.

You are free to refuse to participate or to stop participating at any time with no penalty. If you have decided to participate, your identity will be kept confidential, and you will remain anonymous in any reports of the work.

If you have any questions or would like to find out later about the results of the study, you can contact Dr. Silvina Montrul at +1-217-333-1780, [montrul@illinois.edu](mailto:montrul@illinois.edu), or the address given above. If you have questions about your rights as a participant in this research, you can contact the University of Illinois Institutional Review Board at +1-217-333-2670 or [irb@illinois.edu](mailto:irb@illinois.edu).

UIUC students and affiliates: Your decision to participate, decline, or withdraw from participation will have no effect on your current status or future relations with the University of Illinois.

Please print a copy of this consent form for your records, if you so desire.

University of Illinois  
at Urbana-Champaign

جامعة إلينوي  
في أوربانا شامبين

Department of Linguistics

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### موافقة على الاشتراك في بحث علمي

ندعوك للاشتراك اختياريًا في بحث علمي يتمحور على القدرات اللغوية في الإنجليزية والعربية لدى مجموعات مختلفة من الناس. تحتوي التجربة على عدد من المهام باللغة الإنجليزية أو العربية، حيث سنطلب منك ملء استفتاء لغوي يتناول خلفيتك اللغوية وتجاربك المتعلقة باللغات، وإنجاز بعض المهام التالية أو كلها: تعلم بعض خاصيات لغات مصطنعة والإجابة عن أسئلة متعلقة بما تعلمت حيث ستختار من بين عدد من الاختيارات، سرد قصص استعانة بصور تُقدّم لك، إعادة جمل تُقال لك، تسمية صور تُقدّم لك، تحديد مدى طبيعية مجموعة من الجمل، تحديد صحة محتوى جمل معينة في سياقات معينة، الإجابة عن أسئلة ملء الفراغ. ستستغرق التجربة حوالي ساعة وثلاثة أرباع الساعة وستُجرى في وقت ومكان يناسبك. لا يشكل الاشتراك في



هذا البحث أي خطر لا تشكّله الحياة اليومية. إن اشتراكك في البحث قد لا يفيدك بشكل مباشر، ولكننا على أمل أن تساعدنا النتائج على تحسين فهمنا لكيفية تعلم اللغات الثانية.

يقوم بهذا البحث كل من الدكتورة سلفينا مونترول، أستاذة اللغويات في جامعة إلينوي وإلياس شقور، طالب الدراسات العليا في قسم اللغويات. نطلب اشتراكك في هذه التجربة لأنك تنتمي إلى إحدى الفئات التالية: الناطقين بالإنجليزية أو العربية كاللغة الأم؛ الناطقين بالعربية كلغة أولى والإنجليزية كلغة ثانية؛ الناطقين بالعربية كلغة الأسرة المختلفة عن لغة المجتمع وبالإنجليزية كاللغة الأقوى. على كل مشترك في هذا البحث أن يكون قد بلغ السن الثامن عشر من العمر. ستقوم بالإجابة عن طريق صياغة إجابات مكتوبة أو تحديد اختيارات من بين عدد من الاختيارات في جميع أجزاء التجربة ما عدا الأجزاء التالية: سرد قصص استعانةً بصور تُقدّم لك، إعادة جمل تُقال لك، تسمية صور تُقدّم لك، حيث ستكون إجاباتك في هذه الأجزاء الثلاثة عبارة عن ملف صوتي أو أكثر تقوم بتسليمه. ستُعامل كل الإجابات بسريّة وسيتم تخزينها في مكان آمن.

سيُقدّم الاستفتاء والمهام على شاشة الحاسوب.

سيقوم كل الأساتذة والطلاب والموظفين الذين يتعاملون مع بياناتك بالمحافظة على سريّتها وفقاً للقانون وسياسات الجامعة، ولن يتم نشر أية تفاصيل شخصية أو الإفصاح عنها. بعد انتهاء التجربة سنُدخل كل الإجابات إلى قاعدة بيانات إلكترونية ومن ثم سيتم تحليلها وبعد ذلك نشر النتائج. لن يُدخّل اسمك أو هويتك إلى قاعدة البيانات ولن ينشر مع النتائج. سيحافظ الباحثون على سريّة المعلومات التي تزودنا بها. ولكن البرنامج الحاسوبي المستخدم لإجراء استفتاء قد يصل إلى البيانات التي تقدمها وإلى رقم الأي.بي (بروتوكول الإنترنت) الخاص بالحاسوب المستخدم للقيام بالمهام فلا يمكننا أن نضمن لك أن يحافظ البرنامج على سريّة معلوماتك. لن تُجبر على وضع اسمك على شاشات الأسئلة بل سنعطيك رقم مشترك لتستخدمه عوضاً عن اسمك.

ستحصل على عشرين دولاراً أمريكياً مقابل اشتراكك في هذه التجربة.

لن نستخدم بياناتك في أبحاث مستقبلية دون إعلامك بتفاصيل البحث والحصول على موافقتك الصريحة مجدداً.

بإمكانك رفض الاشتراك أو التوقّف عن الاشتراك في أي وقت ودون أي جزاء. إذا قررت أن تشارك فسيتم الحفاظ على سريّة هويتك ولن تكشف عنها في أي تقارير متعلقة بهذا البحث.

إذا كانت لديك أية أسئلة أو إذا رغبت في معرفة نتائج البحث فبإمكانك الاتصال بالدكتورة سلفينا مونترول على رقم هاتف ١-٢١٧-٣٣٣-١٧٨٠ أو عن طريق عنوان البريد الإلكتروني [montrul@illinois.edu](mailto:montrul@illinois.edu) أو عن طريق العنوان البريدي الموجود أعلاه. وإذا كانت لديك أية أسئلة عن حقوقك كمشارك في هذا البحث فبإمكانك الاتصال بمجلس المراجعة المؤسسي في جامعة إلينوي على رقم هاتف ١-٢١٧-٣٣٣-٢٦٧٠ أو عن طريق عنوان البريد الإلكتروني [irb@illinois.edu](mailto:irb@illinois.edu).

ملاحظة لطلاب جامعة إلينوي في أوربانا شامبين وكل التابعين لها: قرارك أن تشارك في هذا البحث أو أن ترفض الاشتراك فيه أو أن تنسحب منه لن يؤثر على وضعك الحالي أو علاقاتك المستقبلية مع جامعة إلينوي.

الرجاء طباعة نسخة عن نموذج الموافقة هذا إذا رغبت في ذلك.

الاسم الثنائي / Name, First and Last

التاريخ / Date

- ☐ I have read and understand the above consent form. I certify that I am 18 years old or older and, by clicking the button below, I indicate my willingness to voluntarily take part in the study.

أقر بأني قد قرأت وفهمت ما ورد في نموذج الموافقة هذا. أشهد بأني قد بلغت السن الثامن عشر من العمر وبنفري للزر أدناه  
أعبر عن موافقتي على المشاركة في هذا البحث اختياريًا.

University of Illinois at Urbana-Champaign  
Institutional Review Board

Determination Date October 14, 2019  
Closure Date May 1, 2024  
IRB #19707

NATIVE CONTROL GROUPS – GDPR

University of Illinois  
at Urbana-Champaign

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This study is being conducted by Dr. Silvina Montrul, professor of Linguistics at the University of Illinois and Elias Shakkour, graduate student in Linguistics. You are being asked to participate in this experiment because you are a native speaker of English or Arabic; a speaker of Arabic as a first language and English as a second language; or a speaker of Arabic as a family language that is not the societal language, and English as a dominant language. You must be at least 18 years old to participate in this study. Your responses will consist of written responses or multiple-choice selections for all activities except for the following: telling stories using pictures presented to you, repeating sentences spoken to you, and naming pictures presented to you. For these three activities, your responses will consist of one or more audio files submitted by you. All responses will be treated confidentially and stored in a secure location.

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You will be compensated \$20 for participating in this experiment.

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Urbana, IL 61801-3625 USA

## موافقة على الاشتراك في بحث علمي

ندعوك للاشتراك اختياريًا في بحث علمي يتمحور على القدرات اللغوية في الإنجليزية والعربية لدى مجموعات مختلفة من الناس. تحتوي التجربة على عدد من المهام باللغة الإنجليزية أو العربية، حيث سنطلب منك ملء استفتاء لغوي يتناول خلفيتك اللغوية وتجاربك المتعلقة باللغات، وإنجاز بعض المهام التالية أو كلها: تعلم بعض خاصيات لغات مصطنعة والإجابة عن أسئلة متعلقة بما تعلمت حيث ستختار من بين عدد من الاختيارات، سرد قصص استعانةً بصور تُقدّم لك، إعادة جمل تُقال لك، تسمية صور تُقدّم لك، تحديد مدى طبيعية مجموعة من الجمل، تحديد صحة محتوى جمل معينة في سياقات معينة، الإجابة عن أسئلة ملء الفراغ. ستستغرق التجربة حوالي ساعة وثلاثة أرباع الساعة وستجرى في وقت ومكان يناسبك. لا يشكل الاشتراك في هذا البحث أي خطر لا تشكّله الحياة اليومية. إن اشتراكك في البحث قد لا يفيدك بشكل مباشر، ولكننا على أمل أن تساعدنا النتائج على تحسين فهمنا لكيفية تعلم اللغات الثانية.

يقوم بهذا البحث كل من الدكتورة سلفينا مونترول، أستاذة اللغويات في جامعة إلينوي وإلياس شقور، طالب الدراسات العليا في قسم اللغويات. نطلب اشتراكك في هذه التجربة لأنك تنتمي إلى إحدى الفئات التالية: الناطقين بالإنجليزية أو العربية كاللغة الأم؛ الناطقين بالعربية كلغة أولى والإنجليزية كلغة ثانية؛ الناطقين بالعربية كلغة الأسرة المختلفة عن لغة المجتمع وبالإنجليزية كاللغة الأقوى. على كل مشترك في هذا البحث أن يكون قد بلغ السن الثامن عشر من العمر. ستقوم بالإجابة عن طريق صياغة إجابات مكتوبة أو تحديد اختيارات من بين عدد من الاختيارات في جميع أجزاء التجربة ما عدا الأجزاء التالية: سرد قصص استعانةً بصور تُقدّم لك، إعادة جمل تُقال لك، تسمية صور تُقدّم لك، حيث ستكون إجاباتك في هذه الأجزاء الثلاثة عبارة عن ملف صوتي أو أكثر تقوم بتسليمه. ستعامل كل الإجابات بسريّة وسيتم تخزينها في مكان آمن.

سيُقدّم الاستفتاء والمهام على شاشة الحاسوب.

سيقوم كل الأساتذة والطلاب والموظفين الذين يتعاملون مع بياناتك بالمحافظة على سريّتها وفقًا للقانون وسياسات الجامعة، ولن يتم نشر أية تفاصيل شخصية أو الإفصاح عنها. بعد انتهاء التجربة سنُدخل كل الإجابات إلى قاعدة بيانات إلكترونية ومن ثم سيتم تحليلها وبعد ذلك نشر النتائج. لن يُدخّل اسمك أو هويتك إلى قاعدة البيانات ولن ينشر مع النتائج. سيحافظ الباحثون على سريّة المعلومات التي تزودنا بها. ولكن البرنامج الحاسوبي المستخدم لإجراء استفتاء قد يصل إلى البيانات التي تقدمها وإلى رقم الآي.بي (بروتوكول الإنترنت) الخاص بالحاسوب المستخدم للقيام بالمهام فلا يمكننا أن نضمن لك أن يحافظ البرنامج على سريّة معلوماتك. لن تُجبر على وضع اسمك على شاشات الأسئلة بل سنعطيك رقم مشترك لتستخدمه عوضًا عن اسمك.

ستحصل على عشرين دولارًا أمريكيًا مقابل اشتراكك في هذه التجربة.

لن نستخدم بياناتك في أبحاث مستقبلية دون إعلامك بتفاصيل البحث والحصول على موافقتك الصريحة مجددًا.

بإمكانك رفض الاشتراك أو التوقف عن الاشتراك في أي وقت ودون أي جزاء. إذا قررت أن تشترك فسيتم الحفاظ على سريّة هويتك ولن نكشف عنها في أي تقارير متعلقة بهذا البحث.

إذا كانت لديك أية أسئلة أو إذا رغبت في معرفة نتائج البحث فبإمكانك الاتصال بالدكتورة سلفينا مونترول على رقم هاتف ١-٢١٧-٣٣٣-١٧٨٠ أو عن طريق عنوان البريد الإلكتروني [montrul@illinois.edu](mailto:montrul@illinois.edu) أو عن طريق العنوان البريدي الموجود أعلاه. وإذا كانت لديك أية أسئلة عن حقوقك كمشارك في هذا البحث فبإمكانك الاتصال بمجلس المراجعة المؤسسي في جامعة إلينوي على رقم هاتف ١-٢١٧-٣٣٣-٢٦٧٠ أو عن طريق عنوان البريد الإلكتروني [irb@illinois.edu](mailto:irb@illinois.edu).

ملاحظة لطلاب جامعة إلينوي في أوربانا شامبين وكل التابعين لها: قرارك أن تشترك في هذا البحث أو أن ترفض الاشتراك فيه أو أن تنسحب منه لن يؤثر على وضعك الحالي أو علاقاتك المستقبلية مع جامعة إلينوي.

الرجاء طباعة نسخة عن نموذج الموافقة هذا إذا رغبت في ذلك.

## **General Data Protection Regulation (GDPR) Notice/Consent**

The University of Illinois [Web Privacy Notice](#) and [Supplemental Privacy Notice for certain persons in the European Economic Area](#) describe in detail how the University processes personal information.

**إشعار وموافقة بخصوص النظام الأوروبي العام لحماية البيانات**

إن الإشعار حول خصوصية البيانات على الإنترنت والإشعار الإضافي حول خصوصية بعض الأشخاص الموجودين في المنطقة الاقتصادية الأوروبية، والصادر عن جامعة إلينوي، يصفان بدقة طريقة معالجة الجامعة للبيانات الشخصية.

- ☐ I consent to the processing of my personal information for the purpose of research as set forth in this online Consent Notice. I understand that I may withdraw my consent at any time, but doing so will not affect the processing of my personal information before my withdrawal of consent.

أوافق على معالجة بياناتي الشخصية بغرض إجراء الأبحاث وقف ما قد ورد في إشعار الموافقة هذا الموجود على الإنترنت. قد فهمت أنه يحق لي سحب موافقتي في أي وقت، وأن ذلك لن يؤثر على معالجة بياناتي الشخصية قبل سحبي للموافقة.

Name, First and Last / الاسم الثنائي

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Date / التاريخ

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- ☐ I have read and understand the above consent form. I certify that I am 18 years old or older and, by clicking the button below, I indicate my willingness to voluntarily take part in the study.

أقر بأنني قد قرأت وفهمت ما ورد في نموذج الموافقة هذا. أشهد بأنني قد بلغت السن الثامن عشر من العمر وبنفري للزر أدناه أعبر عن موافقتي على المشاركة في هذا البحث اختياريًا.

University of Illinois at Urbana-Champaign  
Institutional Review Board

Determination Date October 14, 2019  
Closure Date May 1, 2024  
IRB #19707

## APPENDIX N: INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL



### OFFICE OF THE VICE CHANCELLOR FOR RESEARCH

Office for the Protection of Research Subjects  
805 W. Pennsylvania Ave., MC-095  
Urbana, IL 61801-4822

#### Notice of Approval: New Submission

May 2, 2019

<b>Principal Investigator</b>	Silvina Montrul
<b>CC</b>	Elias Shakkour
<b>Protocol Title</b>	<i>The effect of full-immersion schooling on ultimate attainment nativelikeness and dominance in Palestinian Arabic-American English bilinguals</i>
<b>Protocol Number</b>	19707
<b>Funding Source</b>	Unfunded
<b>Review Type</b>	Exempt 2
<b>Status</b>	Active
<b>Risk Determination</b>	no more than minimal risk
<b>Approval Date</b>	May 2, 2019
<b>Closure Date</b>	May 1, 2024

This letter authorizes the use of human subjects in the above protocol. The University of Illinois at Urbana-Champaign Institutional Review Board (IRB) has reviewed and approved the research study as described.

The Principal Investigator of this study is responsible for:

- Conducting research in a manner consistent with the requirements of the University and federal regulations found at 45 CFR 46.
- Using the approved consent documents, with the footer, from this approved package.
- Requesting approval from the IRB prior to implementing modifications.
- Notifying OPRS of any problems involving human subjects, including unanticipated events, participant complaints, or protocol deviations.
- Notifying OPRS of the completion of the study.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

IORG0000014 • FWA #00008584  
217.333.2670 • irb@illinois.edu • oprs.research.illinois.edu



## OFFICE OF THE VICE CHANCELLOR FOR RESEARCH

Office for the Protection of Research Subjects  
805 W. Pennsylvania Ave., MC-095  
Urbana, IL 61801-4822

### Notice of Approval: Amendment 1

May 21, 2019

<b>Principal Investigator</b>	Silvina Montrul
<b>CC</b>	Elias Shakkour
<b>Protocol Title</b>	<i>The effect of full-immersion schooling on ultimate attainment, nativelikeness, and dominance in Palestinian Arabic-American English bilinguals</i>
<b>Protocol Number</b>	19707
<b>Funding Source</b>	Unfunded
<b>Review Type</b>	Exempt 2
<b>Amendment Requested</b>	Updating research team, adding detail about audio submission
<b>Status</b>	Active
<b>Risk Determination</b>	No more than minimal risk
<b>Approval Date</b>	May 21, 2019
<b>Closure Date</b>	May 1, 2024

This letter authorizes the use of human subjects in the above protocol. The University of Illinois at Urbana-Champaign Institutional Review Board (IRB) has reviewed and approved the research study as described.

The Principal Investigator of this study is responsible for:

- Conducting research in a manner consistent with the requirements of the University and federal regulations found at 45 CFR 46.
- Using the approved consent documents, with the footer, from this approved package.
- Requesting approval from the IRB prior to implementing modifications.
- Notifying OPRS of any problems involving human subjects, including unanticipated events, participant complaints, or protocol deviations.
- Notifying OPRS of the completion of the study.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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## OFFICE OF THE VICE CHANCELLOR FOR RESEARCH

Office for the Protection of Research Subjects  
805 W. Pennsylvania Ave., MC-095  
Urbana, IL 61801-4822

### Notice of Exempt Determination

October 14, 2019

<b>Principal Investigator</b>	Silvina Montrul
<b>CC</b>	Elias Shakkour
<b>Protocol Title</b>	<i>The effect of full-immersion schooling on ultimate attainment nativelikeness and dominance in Palestinian Arabic-American English bilinguals</i>
<b>Protocol Number</b>	19707
<b>Funding Source</b>	Unfunded
<b>Review Category</b>	Exempt 2 (ii)
<b>Amendment Requested</b>	<ul style="list-style-type: none"><li>• Updating the time estimates for research activities</li><li>• Updating the compensation for research activities</li></ul>
<b>Amendment Determination Date</b>	October 14, 2019
<b>Closure Date</b>	May 1, 2024

This letter authorizes the use of human subjects in the above protocol. The University of Illinois at Urbana-Champaign Office for the Protection of Research Subjects (OPRS) has reviewed your application and determined the criteria for exemption have been met.

The Principal Investigator of this study is responsible for:

- Conducting research in a manner consistent with the requirements of the University and federal regulations found at 45 CFR 46.
- Requesting approval from the IRB prior to implementing major modifications.
- Notifying OPRS of any problems involving human subjects, including unanticipated events, participant complaints, or protocol deviations.
- Notifying OPRS of the completion of the study.

Changes to an **exempt** protocol are only required if substantive modifications are requested and/or the changes requested may affect the exempt status.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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