

Agreement and Parent Input

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Introduction

Input is a potential factor in the acquisition of language that could possibly be manipulated in order to help push children with language impairments along in clinical settings. Within the tense and agreement system, there may be an optimal input that helps the growth of the child in the development of grammar (Rispoli, 2012). This optimal input may consist of a higher rate of third person singular (3s) in input, so that it approaches the rate of contracted –is, auxiliary and copula ('s).

In order to find this optimal input, researchers must examine the rates of each morpheme in parents and determine how they affect the development of grammar in a child. When researchers examine input, we can conceptualize two different approaches: *time-zero* approach and *dynamic* approach. These two approaches make very different assumptions about how input may help a child acquire language. In brief, a time-zero approach assumes that relevant characteristics of input are static, whereas a dynamic approach assumes that input changes and that the change in input facilitates acquisition.

In a time-zero approach to input, the input is usually measured at a point in time where the child's output does not vary (Brown, 1973; Newport, Gleitman & Gleitman, 1977; Moerk, 1978; Hadley, Rispoli, Fitzgerald, & Bahnsen, 2011; Rispoli, 2012). The "time-zero" should be at a point in the developmental sequence of the child known to precede important subsequent developments. The input measurements made at this marker are compared to the output of the child at a later point in time to see if any correlations are found between the input and output. A time-zero approach assumes that the input is static throughout development, or that if it does change, this change does not matter.

A time-zero approach also has considerations that need to be taken into account in addition to the assumptions it carries. A major concern is the need to control for the child's level of development. This means that other factors, such as biological predisposition to learning language and the developmental sequence, must be controlled when exploring input effects. In order to control for the child's developmental level, one must have a clear picture of precursors to the developments of interest. Unless a child is developmentally ready to benefit from input, the input may have no discernible effect. It is crucial, therefore to understand the precursors and sequels in a developmental sequence.

There are also limitations present in a time-zero approach. The time frame that is examined is key. When the developmental time frame studied is too large, the input may change. This would mean that the change is not accounted for. No effect would be observed, even though an effect is present within a shorter time frame. When the developmental time frame is too small, the rate of development may not be fast enough, even for child ready to benefit from the input. A study would then fail to find effects, although effects are actually present in a more extended time frame.

A number of studies can be classified as time-zero approaches. One of the first studies that focused on parent input was a time-zero study by Newport, Gleitman & Gleitman (1977). The goal of the study was to examine the style of mothers (motherese) when talking to children learning language and determine whether these style differences had any influence on the rate at which children acquired language. This study took fifteen mother-daughter pairs and examined them twice at a six month interval. The children were in a wide range of ages and levels at the start, ranging from 12 to 27 months. The parents, however, were only examined at the first time point. Although the authors concluded that many properties of the motherese observed did not

significantly impact the child's language acquisition, they did find that certain features of a child's grammar appeared to slightly influence mother's language. They found that mothers with children who were younger (from 12-15 months) used action-directives more. Mothers with older children (from 21-27 months) used more declarative comments. This could have been because parents tried to engage in more conversation since the child was developing more linguistically. The more novel contributions the child made in an interaction, the less the mother directs the child. Thus a finding of this study was that input actually changes with the child's age, and that in fact, certain aspects of input are not static at all. However, this broad change in input did not appear to be related to individual children's development.

In sum, a time-zero approach assumes that input does not change significantly, needs to be controlled for developmental levels at time-zero, needs to have developmental sequences understood, and finally, must choose a time frame in which the effects of input can have an effect given the natural rate of growth. There are multiple challenges to a time-zero approach, but they are not insurmountable. In particular, the child's developmental level at the time input is measured should be controlled. Also, a failure to find relationships might arise because the data are from the wrong period of development.

A dynamic approach examines the relationship between parental input and the child's production over time (Furrow, Nelson, & Benedict, 1979; Ninio & Bruner, 1978; Baker & Nelson, 1984). It looks at the relationship between the trajectories of input and output, where the input is measured at multiple time points and is compared to the child at varying points to see if there are any relationships. Change in input over time might potentially impact the child's development.

A consideration in dynamic approaches, just as in a time-zero approach, is the need to control for the child's level of development. It is still important to control this level so that if change in input is observed, we can determine whether the change is influencing development, or, rather, is a reaction to it. Consider the finding previously mentioned from Newport and Gleitman (1977). Parents shifted from directive to declarative sentences because the children were changing. If one can show that a child does not progress because the input does not change in a timely manner, then one has evidence of causal relationship between input and output. There are also other considerations involved in a dynamic approach study. One must have an estimate of when the timely adjustment will occur in the input. If no relationships are found, but the wrong developmental time frame was examined, one may be led to reject the hypothesis that input and output are related, when in fact they are related. It is therefore important to be aware of the developmental sequence of the child, as well as when the adult may adjust their input. The estimate of when the input should change should be based on when the child is changing.

A classic example of a dynamic relationship between input and the child's language development has been called *scaffolding*. Scaffolding is a process in which the mother increases the complexity of what she does to serve as a "carrier-wave" in order to help the child onto new communicative functions (Ninio & Bruner, 1978). They took one parent-child pair and examined how turn-taking in dialogue interactions between parent and child aided the child in mastering the labeling process, as well as the mother's role in this process. They chose a child who was just about to enter the one word stage, so they knew her sequence of development and were therefore able to focus on her next major transition in development. They then examined the parent's change over time in relation to the child's development. Within the natural structure of conversation that was observed in the mother-child pair, they were able to determine that the

mother changed in her treatment of babbling and vocalizations as the child began to use lexical terms. Scaffolding was observed in how the mother responded to her child vocalizations. As the child's vocabulary grew, the mother stopped accepting babbling as concrete answers, and began asking more questions, pressing for a well-formed word or word approximation. Also, as the child began to label items, whenever an incorrect label was said, the mother negated the label, and offered a new one. This had an immediate effect on the child, as only once, out of 11 opportunities, did the child repeat a negated label. This dynamic approach helped set the stage for the fact that parent input may change over time unconsciously as a way to support and help the child progress through language development, in this case guiding the child to produce labels appropriately.

Another study that took a dynamic approach to an intervention was Baker & Nelson (1984). They explored *recasting* and its role in grammatical development through two different intervention studies. Recasting is defined as a language adjustment in the input that provides new information to a child's immediately prior utterance. Recasting is not merely imitation. Through both of the intervention studies performed, recasting was shown to be an effective contributor to the usage of new language forms by the child, specifically passives and auxiliaries. Recasting is thought to work because feedback is provided within the attentional limitations of the child, triggering analysis and acquisition of new forms.

Parent input is not only relevant to research, but also to clinical interventions. As a clinical tool, recasting may help with optimal input, as it may be able to help the child adjust their grammar to new and correct forms more quickly. However, children must be ready for the uptake of input in order to maximize its effects during the intervention (Fey, Long, & Finestack, 2003). If the child is not developmentally ready to analyze the input they are presented with, then

they will not benefit from their interventions. It is important, therefore, to know not only where the child is in the developmental sequence, but also how the input can be manipulated in order to help the child the most. Whether changes occur naturally in the input or not, clinicians must be aware of these characteristics in order to further manipulate the input so that it can be maximized for the highest potential of uptake by the child. Input can be presented in a way, like *recasting*, which helps the child advance through intervention more efficiently. This recasting manipulates the input in such a way that a correct, and often expanded upon, child utterance is repeated by the clinician. They are reacting to the child's previously said utterance, which may help the child uptake the information in the new utterance. It may turn out that recasting specific structures at very specific points in development is necessary for progress, or it may turn out that continuous scaffolding is more appropriate for other structures or subsystems of grammar. Such knowledge could potentially strengthen our interventions, allowing us to design them with developmental sensitivity that will make them more effective. This is why it is important to be aware of whether a dynamic or time-zero approach needs to be taken in studying the input for specific grammatical subsystems.

Input and the Acquisition of Tense / Agreement

The role of parental input in the acquisition of the tense and agreement system has only recently begun to be studied. Hadley, Rispoli, Fitzgerald, & Bahnsen (2011) asked whether variation in parent input accounted for differences in children's rate of growth in tense productivity, taking a time-zero approach.

They examined parents' usage of the tense and agreement system at 21 months before children had made any significant progress in the development of tense / agreement. Thus, they controlled the child's developmental level. They found that more ambiguous tense marking in

the input early on had a negative correlation with the child's rate of tense productivity growth over time. Ambiguous tense marking involves verbs that do not give indication to their subject, such as "I want some juice", which would be the same as "You want some juice." There is no difference in the verb, even though different subjects are present. "He wants some juice," however, is not ambiguous in that the verb affix signals the subject is third person singular. Their findings suggest that specific aspects of the input are very important for the child's acquisition of the tense and agreement system.

Rispoli (2012) also used time-zero approach in a more in depth study of input's role in the acquisition of the tense and agreement system. In order to account for developmental level of the child, for the child's vocabulary and TAP scores at 21 months were controlled. He proposed the Misalignment Hypothesis, which is an idea of what the optimal input would entail. The Misalignment Hypothesis is the difference score between 's frequency and 3s frequency in the input ('s is much more frequent than 3s). Rispoli (2012) wanted to determine if a large difference in the rates of 3s and 's hurt the child's growth in tense productivity. Specifically, given the large gap between the high frequency of 's and low frequency of 3s, Rispoli posited that children needed more input on 3s to acquire agreement rapidly. Following the Misalignment Hypothesis, optimal input would reduce the frequency of 's and increase the frequency of 3s. He found that, although 's was used much more in the input at 21 months, it had a negative correlation with the Tense and Agreement Productivity (TAP) Score (Hadley & Short, 2005; Rispoli, Hadley & Holt, 2009) and the Test of Early Grammatical Impairment (TEGI: Rice & Wexler, 2001) scores at 36 months. The use of 3s in the input, however, had a positive correlation with the TAP score, helping to show that 3s may be part of the optimal input for acquisition of the tense and agreement system.

Time-zero and dynamic approaches are two very different ways of conceptualizing the relationship between input and the child's development. They make different assumptions about the input. Nevertheless, both must control for the developmental level of the child and with a solid picture of the developmental sequence in order to determine whether there are input effects. Despite some success in finding input effects on the development of the tense and agreement system (Hadley, Rispoli, Fitzgerald & Bahnsen; Rispoli, 2012) it has never been asked whether the input of an adult does change over time in specific aspects of the tense and agreement system. If input does adapt as the child progresses through the developmental sequence, then future parent input studies must take this change into account. The causal relationship between parent input and child output becomes much more complicated and not as easily defined as it may be with a time-zero approach. If the input does change, future research will need to adopt a more dynamic approach to studying parent speech so that this change may be readily accounted for. If input does not change over time, then it can be viewed as a static and a time-zero approach may be appropriate.

It could be that as parents start to engage in more of a conversational style with their child, the frequencies of 's and 3s may change: there will be less labeling and more description. This would reduce *what's this* and *it's a x* type input sentences and increase statements like *Pooh loves his honey*. Such change may even provide a scaffold for furthering the child's acquisition of the tense and agreement system. But before a dynamic approach to input can be pursued, first it would be more expedient to ask whether parents actually do change over time, and especially early in the third year of the child's life.

Therefore, the purpose of this study is to determine if the input rates of 3s and 's change as the child's grammar grows, in almost a scaffolding effect. If it does, then a dynamic approach

may be necessary in researching the input effects of 's and -3s on the child's rate of acquisition of the tense and agreement system. The specific questions asked in this study are:

1. Do the frequencies of 's (copula and auxiliary) and 3s in the input differ?
2. Do the frequencies change in a way that suggests parents are scaffolding?

Methods

Database

Data for the current study were obtained from an existing longitudinal database (Rispoli & Hadley, 2008). The overarching purpose of the longitudinal study is to document the growth of tense and agreement between 21 and 36 months of age and the contribution of parent input to that growth. The child and primary caregiver visited the laboratory a total of seven times at ages 21, 24, 27, 30, and 33 months and twice at 36 months. Each session was audio and video recorded. To date, a total of 58 families have contributed to the database.

Participants

Participants were recruited from the campus community and surrounding rural communities in Champaign, Vermillion, and Macon counties in Illinois through newspapers, campus listservs, and flyers distributed to day care centers and community facilities for the 15 month longitudinal study. Interested parents contacted the researchers, and researchers conducted a phone interview to determine if the child was developing typically. Parents were questioned on general health of the child, pre-maturity or trauma at birth, prolonged hospitalization, Otitis media, developmental milestones, talkativeness, and intelligibility. Children reported to have frank neurological or sensory impairments, repeated bouts of Otitis media (i.e. 6 or more infections), the insertion of pressure equalization tubes, or delayed onset of walking or talking (i.e. after 15 months) were not invited to participate. All children selected for the study were

from English-only speaking homes. For their participation, participating families were compensated \$20.00 for each of the seven measurement point visits. Children also received toys as incentives (i.e., teddy bear in Illinois shirt, wind-up toy) for the 24 and 36 month measurement points.

Information was gathered regarding the children's general developmental abilities at 21 and 24 months of age using the Ages and Stages Questionnaire (ASQ, Bricker & Squires, 1999). Of the 58 potential toddler participants, 29 passed the screening domains at 21 and 24 months of age (i.e. communication, gross motor, fine motor, personal-social, and problem solving), and 38 passed the communication screening at both ages. Information on the children's expressive vocabulary was obtained using the *MacArthur Communicative Development Inventories* (CDI, Fenson et al., 2007). The majority of children fell between the 15th and 85th percentiles, with 2 children falling below the 15th percentile, 18 in the low average range, 13 in the high average range, and 5 above the 85th percentile.

The participants for the current study included parents of the children at 21, 24, and 27 months that were part of the existing longitudinal database described above. Nine mothers were selected based on their Misalignment Score (Rispoli, 2012). The mothers were then separated into four quartiles in the distribution of the Misalignment Score, with mothers placed at $< -1 \text{ SD}$, $> -1 \text{ SD} < 0 \text{ SD}$, $> 0 \text{ SD} < 1 \text{ SD}$, and $> 1 \text{ SD}$. They were listed in order of their participant ID. Using a random number generator, two mothers were selected from each quartile listed for a total of eight mothers. The last mother was randomly selected by combining the middle quartiles (-1 SD to $+1 \text{ SD}$). The nine mothers chosen were the following: GTP01G, GTP05G, GTP09G, GTP30B, GTP39B, GTP44B, GTP45G, GTP49G, GTP55G.

Procedure

Audio and video recordings of two 30-min language samples at each measurement point from ages 21 to 36 months were available in the database. Children were recorded with a primary caregiver for the first 30-min sample and instructed to “play as they would at home” with age –appropriate toys. For the second 30-in sample, an examiner joined the child through various semi-structured play scenarios designed to elicit the tense and agreement morphemes of interest. These scenarios included puzzles, games, constructing Mr. Potato Head a care-giving scenario with dolls, or play with wind-up toys. Examiners included two graduate research assistants and the primary investigator. One examiner participated in each child’s second 30-min play sample.

Transcription

Each 30-min sample was transcribed in its entirety using the standard conventions for the Systematic Analysis of Language Transcripts (SALT; Miller & Iglesias, 2010). Transcription was completed in two passes. First, project investigators or trained graduate and undergraduate research assistants transcribed child utterances for the entire 30-min parent sample and 30-min examiner sample. Next, all adult utterances from both the 30-min parent sample and 30-min examiner sample were transcribed. Transcribers listened to each child and adult utterance a maximum of three times to maintain conservative measures of the child’s language abilities. Project investigators, graduate, or undergraduate research assistants, or trained laboratory volunteers used the DVD recordings of both examiner sessions to add contextual notes to the transcripts for increased clarity and accuracy.

Reliability

A third transcriber, one who had not completed adult or child transcription for the language sample, completed consensus by re-listening to all utterances for accuracy. This consensus

transcriber was allowed to add content words, delete morphemes, or change utterances to unintelligible if unconfirmed. In instances where the consensus transcriber heard an additional, untranscribed word or morpheme, an additional laboratory transcriber was called in as a third party listener to confirm the decision. Consensus transcription procedures served as the transcription reliability procedures for the current study.

For 24 and 27 month samples, yet another research assistant re-listened to the entire transcript for reliability. This research assistant also reviewed all coding at 24 and 27 months.

Coding and Dependent Variable

Transcripts at 24 and 27 months were then coded for 's and 3s in the parent only session. Transcripts at 21 months had previously been coded. Only complete, spontaneous, and intelligible child-directed utterances were coded. Routines, partially unintelligible, completely unintelligible utterances, and abandoned utterances were excluded, as well as utterances in which the parent and examiner directed at the other adult.

In order to be coded as 's, the verb needed to be either the copula or auxiliary be in contracted form and were coded as /'s. For 3s, only verbs that were in the third person singular were coded, and they were coded as /3s. However, 3s utterances were not coded if they were irregular third person singular verbs, such as *says* and *has*.

After coding was completed, the frequencies of each morpheme were computed using SALT (SALT; Miller & Iglesias, 2010). The frequency of /'s was divided by the number of complete and intelligible utterances produced by the mother. The frequency of /3s was also divided by the number of complete and intelligible utterances produced by the mother. The formulas used were the following:

$$\frac{\text{Number of 's (auxiliary and copula is contracted)}}{\text{Total parent Utterances}}$$

$$\frac{\text{Number of 3s (verb affixes)}}{\text{Total parent utterances}}$$

Results

The purpose of this study was to explore the rates of 's, 3s and the difference between the two rates in parents' speech over a 6 month time-frame, between 21 and 27 months. Two questions were addressed. Question 1 examined whether or not the rates of 's or 3s were the same or different in the input of parents to children. Question 2 examined if there was any consistent direction of change in the three measurements taken.

Descriptive Language Measures

In order to give the reader a sense of the relative rate of 's and 3s and the difference between the two at 21, 24, and 27 months, the average total number of parent utterances, average number parent utterances containing 's, and the average number of parent utterances containing 3s are presented in Table 1. There was little change across the three time points for each rate examined, as seen in Table 1, with no overlap between the rates of 's and 3s. For all three time-points, the average of 3s was less than 3%. At 21 and 27 months, the rate of 's is 6 times more frequent than 3s. At 24 months, it was 4 times greater in the input than 3s. These distributions, arithmetically, were different, as 's was much more frequent than 3s in the input.

Differences in Rate of 's and 3s production in parents.

To test whether the rate of 's was different from the rate of 3s, a series of three T-tests were performed on correlated samples at three sequential time points. This was completed by

using a dependent sample T-test, in which mothers were compared with themselves over time. The null hypothesis, in this case, was that the rates would be the same at each time point. The α was set to a lower value than the traditional .05 because the measurements were made for the same mothers. This lowering of a α is called a Bonferroni Correction. The α was divided by 3, because there were three comparisons performed. Therefore alpha was set at $\alpha=.0167$ for these T-tests. At 21 months, $t(8) = 7.87, p = .000$; at 24 months, $t(8) = 7.24, p=.000$; at 27 months, $t(8) = 15.26, p = .000$. At each time point, the null hypothesis was rejected. The rate of 's was statistically higher than the rate of 3s.

Differences in Rates of Production Over Time

To test whether there was a consistent direction of change in the rates of 's and 3s over time in parents' input, a series of 6-correlated sample T-tests were performed. A Bonferroni Correction was given to α again, resetting alpha to $\alpha = .008$. The null hypothesis, in this case, was that there was no change over time. The results showed no change over time for 's; 21 compared to 24 months, $t(8) = -1.13, p = .29$; 24 compared to 27 months, $t(8) = 1.48, p = .18$; and 21 compared to 27 months, $t(8) = -1.83, p = .78$. The null hypothesis could not be rejected; the parental rate of 's production did not change over time.

The null hypothesis for 3s was the same as in the case of 's, namely that there was no change over time. No differences were detected; 21 months compared to 24 months, $t(8) = -1.83, p = .14$, 24 compared to 27 months, $t(8) = .15, p = .17$, and 21 compared to 27 months, $t(8) = -.74, p = .48$. There was no change over time in the parental rate of 3s when talking to their toddlers.

The constancy of the rate difference between 's and 3s over time was also tested. A Bonferroni correction was applied again, as three comparisons were being made, $\alpha = .0167$. The

null hypothesis was that there would be no consistent change over time. No change was seen in difference rate; 21 compared to 24 months, $t(8) = -.86, p = .41$, 24 compared to 27 months, $t(8) = .83, p = .43$, and 21 compared to 27 months, $t(8) = -.03, p = .77$. Again, the comparisons showed there was no statistically significant direction of change in the difference between 's rate and 3s rate over time.

Fluctuation Over Time

In order to examine individual rates in each mother's speech across time, Figures 1 and 2 were created. Figure 1 presents the rates of 's production by parents at 21, 24, and 27 months. There was much variability in the rates of each individual parent, as the changes were not systematic. However, no parent ever dropped below a rate of 7 per 100 utterances for 's production at any time point. Only one parent (49G) appeared to increase production in of 's over time. Since the mothers varied in an unsystematic manner, there was no general trend over time observed.

Figure 2 presents the rates of 3s production by parents at 21, 24, and 27 months. Again, it was observed that parents fluctuated over time in an unsystematic manner. However, no parent ever reached above a rate of 6 per 100 utterances for 3s production at any point in time. The two rates, 's and 3s, were two completely separate rates in the input by parents, never overlapping. There was no general trend of change over time observed for parents in the production of either 's or 3s.

Discussion

The purpose of this study was to determine if the input rates of 3s and 's change as the child's grammar grows, suggesting that parents scaffold these morphemes. Parent input was examined at 21, 24, and 27 months. The input rates of 3s and 's were not found to change

consistently over time. There were many individual fluctuations, but no overall group trend. This finding suggests that parents are not scaffolding these morphemes, at least not within the timeframe studied, namely 21-27 months of age.

One implication of this finding is that, to capture individual differences between parents in input for these morphemes, a single point, or time-zero approach to sampling can be used. In a time-zero approach, the input is not seen as dynamic, and input is relatively fixed. The key to using a time-zero approach for sampling is that the growth of these morphemes in children is well understood. Fortunately, the development of the tense and agreement system has been well studied (Rispoli, Hadley & Holt, 2009). It is known from this research that children have essentially no productivity in tense and agreement at 21 months of age, the first time point sampled in this study. Thus, in studying the question of input effects on the tense and agreement system, it is recommended that parental input data be sampled early in the child's third year of life, as in the current study. Although the parents' input was not found to change in a scaffolding manner, an important aspect of the input was observed. The study found that there is a low frequency of *3s*, which does not change over time. Therefore, if parents are doing anything to help their children acquire the *3s*, it is subtle. In regards to *'s*, we see that the copula is much more abundant in the input and is contracted very often. The morpheme *'s* had a much higher frequency in the input than *3s*. The rates found should be kept in mind as children acquire the tense and agreement system, as these morphemes may indicate which ones children are more likely to acquire first (Rispoli, Hadley & Holt, 2012).

Clinical Relevance

The results have shown that there are radically different frequencies of *'s* and *3s* in the input of adults, which do not change over time. These findings could help to strengthen

intervention strategies for children who are delayed or having trouble acquiring the tense and agreement system. If a child omits both 's and 3s, it would make more sense to target the copula, since it is the major component of 's. Since 's is potentially supported further by the input, there can be more opportunities for the child to hear it in the input, which may help their uptake and eventual acquisition. By focusing on 's prior to 3s, intervention takes advantage of the numerical advantage the former has over the latter. Intervention would also follow the known sequence of acquisition, in which copula precedes verb -3s.

Limitations and Future Directions

Although these findings provide a good indication of the structure of input in regards to the tense and agreement system, there is still much more that needs to be researched before we can fully understand how children acquire this system. One limitation of the study presented is how 's was examined with both auxiliary and copula, without differentiating between the two. Differentiating the two would have given an even clearer picture of input, determining which is more frequent. Differentiating the two could potentially inform intervention strategies.

The findings presented in this study were observed across ages, with developmental level being accounted for, but not fully examined. At each age that was examined, the children progressed, but at different rates; there were individual differences in the rate of grammatical development. It may be important to control for these findings in future studies. If parents respond to developmental level, rather than just age, scaffolding effects could be missed. However, it is also fair to say that these scaffolding effects are likely to be subtle, because the age range chosen for this study is one in which much change occurs in the tense and agreement system (Rispoli, Hadley & Holt, 2009). All the children were changing to some degree, and yet no consistent change was seen among the parents' input.

In sum, the first half of the third year of life is a period of important grammatical developments. The tense and agreement system emerges for the vast majority of children during this period (Rispoli, Hadley & Holt, 2009). This is the period in which we should expect to see a consistent change in input if the parents were truly scaffolding the tense and agreement system. Although we cannot conclude definitively that scaffolding is absent, we can see that on the basis of this group of typically developing children, the existence of scaffolding seems unlikely.

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Table 1:

Production of 's and 3s During a 6-month Time Period: Avg (SD)			
	21 months	24 months	27 months
Total Utterances	427 (76.3)	447 (92.4)	430 (94.0)
Rate of 's	0.12 (.04)	0.137 (.04)	0.12(.02)
Rate of 3s	0.016 (.01)	0.027 (.02)	0.02 (.01)
Difference in rates of 's and 3s	0.095 (.04)	0.11(.05)	0.098 (.02)

Figure 1:

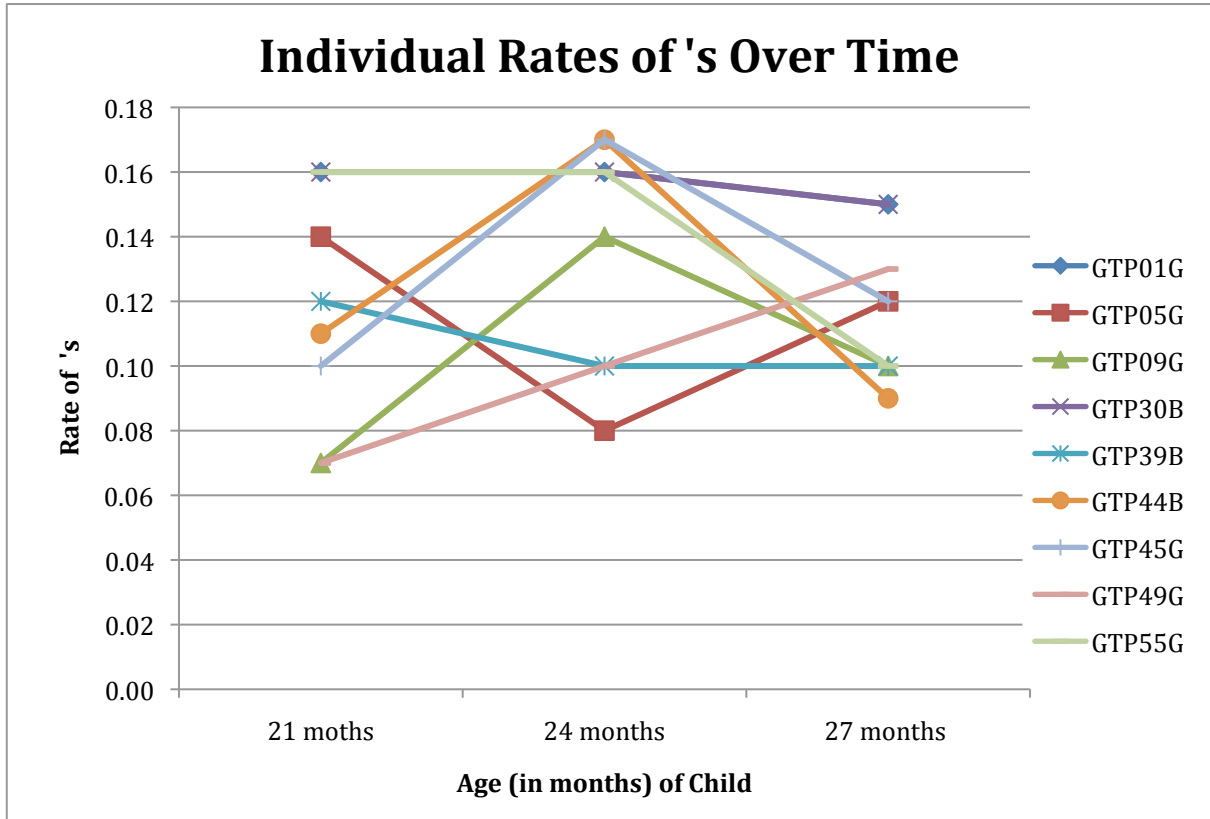


Figure 2:

