THE WITHIN-PERSON VARIABILTY OF VOCATIONAL INTERESTS

BY

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DISSERTATION

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ABSTRACT

Much of what is known about the stability of vocational interests is from a *between-person* perspective (e.g., rank-order stability). This dissertation investigates the *within-person* variability of vocational interests. Three studies employ experience sampling methods to assess the daily fluctuations of RIASEC interests. These studies make three main contributions. First, I apply a whole trait perspective to understanding interests: interests can be stable at the between-person level yet vary at the within-person level. In so doing, I examine whether the within-person operationalization of interests affects the nomological relationship within interest domains (i.e., structural validity) and with personality traits of extraversion and openness. This analysis provides evidence that conceptualizing vocational interests as a density distribution is a viable and appropriate way of assessing a person's interest. Second, G-theory is advanced as a better, more nuanced, and precise method of variance decomposition compared to other methods of variance decomposition. Beyond parsing variance into within- and between-person, G-theory estimates variability that arises due to differences in item selection and administration. Finally, I investigate a potentially better test of Holland's (1997) congruence hypothesis. Rather than the current approach that matches individuals' RIASEC activity preferences to their occupation (which consists of a heterogeneous mix of activities), I investigate the daily measurement of individuals' RIASEC activity preferences matched to the daily work activity they actually do, an activity-interest congruence. Overall, results show that applying whole trait theory to vocational interests is an appropriate operationalization of interests that does not contradict what is currently known about interests at the between-person level. Rather, vocational interests exhibit non-trivial levels of within-person variability across all three studies. Results did not support the ESM test of the congruence hypothesis. Implications and future directions are discussed.

Dedicated to my mother, Ang Ser Keow Angela.

Your life still reverberates, resonates, and resounds with mine.

Yours was a majestic sunset that would last forever but would end too soon.

I miss you every day.

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Soli Deo Gloria

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INTRODUCTION AND OUTLINE OF STUDIES

Much of what is known about vocational interest stability is founded-on research examining interests at the between-person level. Yet, the existence of relationships at one level of analysis does not necessarily imply the same relationships will exist at a different level of analysis (Ostroff, 1993). The goal of this dissertation is to examine vocational interests at the within-person level by using Experience Sampling Methods (ESM). An ESM study is a repeated measurement study design or intensive longitudinal study whereby participants respond to surveys with a short duration between each survey administration, multiple times a day. This dissertation applies Whole Trait Theory (Fleeson & Jayawickreme, 2015) to vocational interest examining its: (1) within-person variability; (2) nomological relationship of interest with personality; and (3) within-person prediction processes by which interest fit (congruence) predicts job satisfaction.

For the purposes of this dissertation, vocational interests are defined as: "trait-like preferences to engage in activities, contexts in which activities occur" (Rounds & Su, 2014, p. 98). Although other models of interest exist (e.g., Kuder, 1977), Holland's (1997) model of vocational interests, that consists of six interest domains (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional; RIASEC), is examined given its widespread use (Savickas & Spokane, 1999).

In defining a construct as trait-like, there are a number of characteristics that serve to mark a construct as trait-like as opposed to a situational variable (Allport, 1931, 1966). For instance, whether a construct idiosyncratically varies from person to person (McCrae & Costa, 2008; Tett & Burnett, 2003), or whether it has a biological basis (Davidson, 1999). Germane to

the trait-likeness of vocational interests I examine their stability and nomological network, and predictive validity across three studies.

Summary of studies

This dissertation consists of three ESM studies. In Study 1, I first discuss the trait-like properties of vocational interests such as their stability and provide a theoretical impetus for understanding the within-person variability of interests in relation to other constructs. Whole Trait Theory is discussed as a potential means to understand the stability and variability of interests. Correspondingly, the purpose of Study 1 was to provide an initial estimate of the within-person variability and stability of vocational interests. Study 1 seeks to answer the question: What is the within-person variability of interests?

In Study 2, the relationship between interests and personality are examined. The goal of Study 2 is to compare the application of Whole Trait Theory to personality, with its longer history to draw from, with the relatively nascent application to interests. I discuss how preservation of the between-person nomological network of interests with personality provides evidence for the appropriateness of conceptualizing interests using a whole trait framework. Study 2 seeks to answer the research question: (1) is the nomological network between interests and personality preserved when examining interest using a density distribution approach?

In Study 3, I examine how a whole trait conceptualization may potentially provide progress in resolving the disconnect between Holland's (1997) hypothesis of congruence and the lack of support for this hypothesis from empirical studies. Specifically, I discuss how to date there is limited meta-analytical support for a fundamental prediction of Holland's (1997) congruence hypothesis: that vocational interest-work environment congruence is related to job satisfaction (e.g., Assouline & Meir, 1987; Tranberg, Slane, & Ekeberg, 1993). I posit that one

potential reason is that congruence as it is currently operationalized—at the between-person level—is not the only theoretically consistent test of the congruence hypothesis. I argue that interest congruence at the within-person level, i.e., *activity congruence*, might be an alternative operationalization and a novel test of the congruence hypothesis. Study 3 seeks to answer: Is activity-interest congruence a reasonable operationalization and test of Holland's congruence hypothesis?

Methods of variance partitioning

In this dissertation, between- and within-person variability are estimated from the three ESM studies. To that end, I employ three variance partitioning strategies: the density distribution approach, hierarchical level modeling (HLM), and generalizability theory (G-theory). Each of these variance-partitioning methods has different limitations that are ameliorated when the three are used jointly.

The density distribution approach is the initial method employed to partition variance in Whole Trait Theory studies (Fleeson, 2001). This approach is the simplest and estimates separately the total variance (variability of the entire set of ESM observations), between-person variance (average variability of the mean trait score across respondents), and within-person variance (the average variability within each person's responses). However, this method is problematic: the total variance obtained is not the sum of the between- and within-person variance. This occurs, in part, because each variance component is estimated separately and without the appropriate modeling of error. Because total variance is not the sum of between- and within-person variance, strong interpretations regarding how much variability in a trait can be attributed to between- versus within-person cannot be made. Nevertheless, this method is applied

because of its use in whole trait studies, allowing comparisons with prior research studies and triangulation and convergence with other variance partitioning research (see Church et al., 2011).

More recently, HLM methods have been used that address the problem of the density distribution approach by estimating the between- and within-person variance simultaneously using the null or empty multi-level model. (See methods of Study 1 for more information on the variance partitioning of the empty model.) The HLM method overcomes the limitation of the density distribution approach in that the sum of the estimated between- (τ_{00}) and within-person (σ^2) variance is taken to represent the total variability (Var (Y_{it}) = $\tau_{00} + \sigma^2$). The HLM method is an improvement over the density distribution approach and is currently one of the most widely employed methods of variance partitioning in Whole Trait Theory studies of traits such as personality, affectivity, and attachment (Church et al., 2011; Haak, Keller, & DeWall, 2017; Zelenski & Larsen, 2000). However, the within-person variance estimate from the empty-model is inflated. In the empty model, the within-person term consists not only of within-person variability, but also includes other variance components such the random error (see: Golding, 1975; Judge, Simon, Hurst, & Kelley, 2014). Thus, a researcher may erroneously conclude that within-person variability accounts for a greater proportion of a trait's variability. As with the density distribution approach, I include HLM partitioning methods because they are commonly used and allow triangulation with other variance partitioning methods.

The final variance partitioning method, G-theory, overcomes the problems associated with previously highlighted methods (Cronbach, Rajaratnam, & Gleser, 1963). Applying G-theory to ESM studies, a person's responses are a function of three factors, the trait level of the respondent (person), the item/stimuli used in the survey (item), and when the response was obtained (time; see Appendix A). The interactions of these three factors—3 two-way

interactions, 1 three-way interaction—and an error term are also estimated as potential sources of variance. (See methods of Study 1 for more information on variance partitioning using G-theory.) In G-theory, between-person variance is estimated as the variance attributable to the person factor, and within-person variance is estimated as the variance attributed to how the person responds as a function of time (i.e., person-by-time interaction). Note that unlike the HLM method, G-theory yields a within-person variance not inflated by other potential sources of variance (e.g., random error and other interaction terms) because these have been parsed out. Unfortunately, this notable advantage of G-theory has not been widely used in ESM studies which have mostly relied on HLM methods (Cranford et al., 2006; Medvedev, Krägeloh, Narayanan, & Siegert, 2017).

Another advantage of the G-theory method is that it accounts for differences in variance due to study design via its interaction terms. Consider a researcher who is torn between two ESM study design choices regarding the items she administers. On one hand, the researcher may wish to vary the items presented to reduce the potential of response sets in participants—drawing these items from larger pool of items. This reduced risk of response sets from participants comes at the cost of adding item unique variance to the data. G-theory accounts for variability attributable to the mixed items selected via the variance of the item factor. Alternatively, the researcher choses to administer the same items across time and can qualify the presence of response sets using G-theory. The effect of these response sets on the variability of the dataset can be detected via the variance of the item-by-time interaction. To that end, the three ESM studies of this dissertation may differ in design, but additional variance due to these design choices can be quantified by G-theory.

STUDY 1: WITHIN-PERSON VARIABILITY OF VOCATIONAL INTERESTS

Traits are relatively stable over time: although fluctuations are possible, generally speaking traits are stable across both context and time (Conley, 1984). Stability is central to defining a construct as a trait and for distinguishing which traits are more *foundational* than others. Vocational interests are trait-like in that they are relatively stable over time. Interests are remarkably stable over time, both in structure (Darcy & Tracey, 2007) and rank-order stability (Low, Yoon, Roberts, & Rounds, 2005).

Despite what is known about the between person stability of vocational interests, it is important to investigate intra-individual variation of vocational interests for at least two reasons. Firstly, what is known about the stability of interests is largely based on studies at the between-person level. These studies, while informative, limit our understanding of how contexts and situational forces influence interests. Longitudinal studies of interest exist; however, the gaps in the time intervals between measurements are large and constrain the study of situational influences on interests to broad life events, and by design exclude the investigation of daily situational influences on interest (e.g., Lubinski, Benbow, & Ryan, 1995; Schultz, Connolly, Garrison, Leveille, & Jackson, 2017). Factors encountered part of daily occurrence such as expectancy of a situation (Wood & Denissen, 2015) or novelty of a situation (Mischel & Shoda, 1995) can activate relevant states. For example, a student attending a scientific presentation should invoke investigative interests because of the expectancy of the situation or potentially because the findings of study were particularly thought provoking. The same level of investigative interests is not expected in another situation when the student moves to another situation (e.g., pottery painting) where artistic interests are then expected to be invoke. These environmental factors are not explicitly tested in this dissertation. Rather quantifying the amount

of within-person (intra-person) variability provides an estimate as to how much external environmental or situational context can activate relevant trait-like vocational interests. Correspondingly, the extent to which there is variability provides impetus for exploring environmental or process variables that influence vocational interests.

Second, examining the within-person variability of interests also provides empirical links to other areas of research that also examine interests. When considering how interests can vary, it is important to distinguish between interest as an emotion that is invoked and vocational interest traits. Interest as an emotion emerges as a generalized response to situational novelty (Silvia, 2005), and provides impetus for further exploration of a target (Tomkins & McCarter, 1964). In contrast, vocational interests represent an idiosyncratic response to preferred stimuli akin to a *crystallized* emotional interest. This distinction between the two is apparent in developmental models of interest; the four-phase developmental model of interests argues that developed interests are the outcome of emotional interests that have been reinforced by the positive evaluation of activities in a particular domain (Hidi & Renninger, 2006; Renninger & Hidi, 2011).

Inherent in such developmental models of interest is a theoretical reconciliation of how momentary situational interests and trait-like interests can co-exist. Yet research into trait interests highlight that they are remarkably stable, more so that other traits such as personality (Low et al., 2005). Indeed, both situational interests and interest traits have for most part remained separate fields of inquiry (Silvia, 2006; Walsh, 2001). If traits are so stable, then this calls into question the utility of situational interests especially in education when it may be the case that long term trait interest is what directs a person's long-term preferences for certain topics (Ainley, 2006). Instead, understanding the within-person variability of vocational interest

would fill an important empirical gap, investigating whether interests can be both stable (trait-like) and variable (state-like) and to what extent there is stability and variability. If this is the case, then it is possible that vocational interests are activated by situations that correspond to the enduring preference of the individual, akin to trait activation theory (Tett & Guterman, 2000). Thus, to the extent individuals encounter trait interest-relevant stimulus during their day, their vocational interests can in turn vary as function of activation towards that stimulus. Accordingly, the degree to which stability and variability of interests represents the boundaries for which the trait-likeness and state-likeness can be reconciled.

How then can the stability of an interest be reconciled with its possible daily variability? Whole Trait Theory provides a means of integrating both stability and variability. Developed to understand the development of personality traits, Whole Trait Theory conceptualizes traits not as resolutely immutable individual differences, but as distributions with moments of a distribution, e.g., means, variances, skewness, and kurtosis (Fleeson, 2001; Fleeson & Jayawickreme, 2015). Most commonly examined are the means and variances of a trait. The means, as a central tendency parameter, describe the trait-level a person idiosyncratically will most typically display (see Figure 1.). Accordingly, mean level differences between people correspond to between-person differences on a trait continuum; a person high in social interests is likely to display greater interest in caring/teaching activities compared to a person with low social interests. The variance in the density distribution, describes the dispersion of a person's interest—the greater variability of when/where the person's social interests are present. A person might have a high trait level of social interests, but it may not be expressed in every situation or time.

Consider two teachers (A and B) both with same relatively high social interests (i.e., no between person differences) but who differ on the variability of their social interests (see Figure

1.). The teacher A who is high in social interest trait level and low in variability is likely to have preference for caring regardless of contexts and during a majority of the time—she/he constantly prefers caring activities (e.g., teaching children and also volunteering to care for the elderly in free time). In contrast, the teacher with same high social interests but a greater variability is likely to have his/her social interests manifest at different trait levels in different contexts; he/she might care for students at work but display lower or higher social interests depending the context. This juxtaposition between two teachers highlights the necessity of quantifying a person's interest variability in addition to central tendency for a more holistic representation of a person's interest.

Study 1 investigates the extent to which there is within-person variability. Because of the nascency in applying Whole Trait Theory to interests, I do not specify any hypotheses regarding which RIASEC interests I expect to vary more than others. Instead, I merely seek to quantify the extent to which people's RIASEC scores fluctuate.

Research Question 1: To what extent do RIASEC interests vary across time?

When applying Whole Trait Theory to vocational interests, several hypotheses can be posited. First, when people respond on a typical (between-person level) interest survey, Whole Trait Theory argues that a person's responses are essentially inferred from their perceived central tendency of themselves on a trait (i.e., a general score). Accordingly, people's mean score of their repeated responses over the duration of an ESM study (a person-mean score) provides a similar assessment of their central tendency and should approximate their general scores. Previous applications of Whole Trait Theory to traits such as personality find that a person's global evaluation is strongly correlated with his/her mean responses across the days of an ESM study (Fleeson, 2001; Geukes, Nestler, Hutteman, Küfner, & Back, 2017).

Hypothesis 1a: RIASEC global scores are positively and strongly related to person level RIASEC scores.

Second, if mean daily interest scores (person-mean scores) approximate a person's global interest scores, it should follow that RIASEC person-mean scores should also exhibit the structural properties of the Holland's RIASEC model. This is important because the structure of Holland's model provides a robust set of expected patterns that are diagnostic of whether Holland's RIASEC model has indeed been measured. According to Holland's (1997) RIASEC model, the six interest domains are arranged in a quasi-circumplex: RIASEC domains are arranged in order around a circumplex but with unequal spacing between each domain (Armstrong, Hubert, & Rounds, 2003). Adjacent RIASEC domain pairs (e.g., R-I and E-C) are closer in the quasi-circumplex and should have higher correlations than other pairs of RIASEC domains. Alternate RIASEC domain pairs (e.g., R-A and C-R) are more distant from each other and should have smaller correlations than adjacent domains. Opposite domain pairs (e.g., R-S and A-C) have the greatest distance between each other and therefore should have smallest correlations. If person-mean scores are similar to global interest scores, then we would expect the structural relationships found in global scores to also be exhibited with person-mean scores (e.g., Rounds & Tracey, 1996). Said differently, if the size of the interrelationship from person level interest scores adheres to the ordering: adjacent > alternate > opposite domains, this provides evidence for the quasi-circumplex and consequently supports the applicability of Whole Trait Theory to vocational interests.

Hypothesis 1b: RIASEC person-mean scores will exhibit a circumplex ordering that is expected of Holland's (1997) spatial model.

Finally, if person level interest scores are estimates of the between-person global interest scores, then in line with previous meta-analyses, person level interest score should display high levels of stability. Previous ESM studies of Whole Trait Theory and personality find that person level personality scores from the 1st week of an ESM study correlate strongly with the person level personality scores from the 2nd week (Church et al., 2011; Fleeson, 2001). Accordingly, I expect the person level interest scores from the first half of ESM study duration to be strongly correlated with the person level interest scores from the second half.

Hypothesis 1c: Person level RIASEC scores from week 1 will be strongly correlated with person level RIASEC scores from week 2.

Methods

Participants. Study 1 were 63 participants who were psychology students (M_{age} = 19.34, SD_{age} = 4.54) recruited from a large mid-western University. In total there were 2033 survey observations, after surveys were removed due to failing three quality control items. Sixty participants completed at least three of the 42 surveys administered (Mean = 31 surveys, Median = 34 surveys). The sample was predominantly female (73%), with a majority Caucasian (56%), followed by Asian (29%), Black (9%), and Hispanic (8%)—note the demographic survey allowed for the selection of more than 1 ethnicity. Participants received course credit for their participation.

Procedure. Study 1 consisted of two parts: a baseline survey completed prior to the daily survey and a daily survey completed three times a day. The baseline survey was completed a week prior to start of the survey and consisted of the all RIASEC items. The daily survey lasted 14 days during which participants completed the measures at three-time points. The first survey for each day was administered at 12pm, the second at 4pm, and the final survey at 8pm. During

each survey participants were provided with a random sample of 6 items per RIASEC domain. Participants were sent a survey link to their email address; the survey was optimized such that participants could respond to the survey on mobile platforms (e.g., mobile phones). To increase the time gap between each survey response, i.e., to prevent participants from responding to two surveys within a short period of time, each survey link was active for 2 hours, thereby ensuring a minimum gap of two hours between surveys.

Measures. Vocational interest in Study 1 was measured using a pool of public domain interest items. Two interest inventories were used to generate this pool: the public domain RIASEC markers (Armstrong, Allison, & Rounds, 2008) and the Occupational Interest Profiler (Kroustalis, Lewis, & Rivkin, 2010); together these two inventories yielded 184 unique items (approximately 31 items per RIASEC domain). At each survey administration, participants were asked to indicate how much they would like to do an activity "right now in this moment". Participants responded on a 5-point scale (1= Strongly dislike, 3 = unsure, and 5 = Strongly like) indicating the degree to which they would like to do an activity as they were at each time. They were instructed to ignore their ability to do these activities and the prestige of the activity but instead to focus on their preference for engaging in the activity. Survey items included quality control items that asked participants to select a specific response regardless of the options provided (e.g., select "Strongly like). Individual surveys were excluded if the quality assurance items were not answer correctly. See Appendix B for items.

Analyses. This section includes explanations of how various scores were calculated, analyses used, and (where relevant) formulas. In addition to apply Whole Trait Theory to understanding interests, I analyzed within person variability using three methods. I discuss these methods in the context of analysis.

Global RIASEC score. This RIASEC score was calculated using the mean score for each RIASEC subscale obtained at baseline.

Time point RIASEC score. The time point level RIASEC score was calculated taking the mean of responses for each time point for each participant. Because Study 1 ran for 14 days each with 3 surveys (morning, afternoon, and night) each participant could potentially receive 252 RIASEC scores (14 days by 3 time points by 6 different RIASEC sub-scale scores).

Day-level RIASEC score. The day level RIASEC score was calculated taking the mean of responses within the same day for each participant. Because Study 1 ran for 14 days, each participant could potentially receive 84 RIASEC scores (14 days by 6 different RIASEC sub-scale scores).

Person-mean RIASEC score. The person level RIASEC score was calculated using the mean day level RIASEC score across 14 days. Each participant would have 6 scores, one for each RIASEC domain.

Density distribution. The first variance partitioning methods were adopted from Fleeson (2001). Fleeson (2001) decomposed the variability of daily responses into three types: total, between- and within-person variability. Total variability refers to the variance estimated from a person's mean interest score across all days, i.e., the variance of the dataset across both persons and days for each RIASEC domain. Between person variance is estimated from the person-mean score across the 14 days for each RIASEC domain. The within-person variance was based on the person level variance obtained by aggregating the three administrations per day for the 14 days. Only the between- and within-person variance estimates are used for purpose of comparisons with other variance partitioning techniques. See Appendix C for sample calculations.

HLM. In line with HLM methods to estimating variability, I examined the between- and within-person variance using the empty (null) model, where person *i* is nested within time *j*:

$$\text{Level 1: } y_{ij} = \beta_{0t} + r_{ij} \quad (2)$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + u_{0j} \quad (3)$$

$$\text{Combined: } y_{ij} = \gamma_{00} + u_{0j} + r_{ij} \quad (4)$$

here, the empty model uses an intercept to represent each the grand mean scores (γ_{00}) but attempts to model daily individual differences from the mean (u_{0j}) in addition to the remaining error (r_{ij}). Germane to the comparison of different variance partitioning techniques is the between- and within-person variance from HLM. Here the total variability of the model can be partitioned as:

$$\text{Var}(Y_{it}) = \text{Var}(u_{0t} + r_{ij}) = \tau_{00} + \sigma^2 \quad (5)$$

Where τ_{00} represents the between-person variability and σ^2 is taken to represent the within-person variability. As highlighted earlier this estimation of within-person variability (σ^2) is likely inflated because it the term captures any variability not attributed to the between-person term (e.g., random error). Analyses for the HLM were conducted using R program package "multilevel" (Bliese, 2016; R Core Team, 2014).

G-theory. As highlighted, when applying G-theory to ESM, three factors (inferential space) can be estimated: person, item, and time (Cranford et al., 2006). That is, a person's daily response and corresponding variance can be partitioned:

$$Y_{\text{ijk}} = \mu + \alpha_i + \beta_j + \gamma_k + (\alpha\beta)_{ij} + (\beta\gamma)_{jk} + (\alpha\gamma)_{ik} + (\alpha\beta\gamma)_{ijk} + e_{ijk} \quad (6)$$

$$\text{VAR}(Y) = \text{VAR}(\alpha) + \text{VAR}(\beta) + \text{VAR}(\gamma) + \text{VAR}(\alpha\beta) + \text{VAR}(\beta\gamma) + \text{VAR}(\alpha\gamma) + \text{VAR}(\alpha\beta\gamma) + e_{ijk} \quad (7)$$

Here, μ represents the grand mean across person, item, and time. The terms α_i, β_j,and γ_k represent the contribution of person *i*, item *j*, and time *k* respectively. Most relevant to this paper is the comparison of between-person variability across *i* persons, denoted by VAR(α) and the within-person variability for *i* person across *k* days, i.e., the person*day interaction denoted by VAR($\alpha\beta$). For interpretation of the sources of variance in an ESM context see Appendix A.

Structural analyses. To examine hypothesis 1a (global scores are similar to person-mean scores), I correlated participant global RIASEC scores with their person level RIASEC scores.

To examine hypothesis 1b (the structural validity of person-mean scores), circular unidimensional scaling (CUS) was used to examine the structural validity of the ESM design in measuring interests. CUS represents a direct way to test the circumplex structure implied by Holland's Hexagon (Armstrong, Hubert, & Rounds, 2003). The analysis yields the common variance-accounted-for (R^2) output similar to regression. This output can then be compared to benchmarks as to whether the structure obtained from the ESM data represents minimal, moderate, and good fit (R^2 = .36, .44, and .60, respectively) to a quasi-circumplex model (Armstrong et al., 2003). CUS analyses were performed using MATLAB (version 9.0.0.341360) with functions described in Hubert, Arabie, and Meulman (2006). I report the mean CUS output (R^2) for each day across all participants as well as the grand mean CUS output from across participants and the ESM study duration.

Finally, to assess hypothesis 1c (the stability of person-mean scores), in line with Fleeson's (2001) original approach to estimating stability, I examined the bi-weekly stability of interests by correlating person level interest scores from the first half of the ESM study period (day 1 to day 7) with the person level interest score from the second half of the study period.

Because G-theory typically relies on complete datasets. Missing data was handled using multiple imputation (Enders, 2010). Participants with at least 3 observed surveys were included in the imputation process. Analyses were conducted on 5 imputed datasets separately and pooled together using Rubin's (1976) rules.

Results

Variance decomposition

Results from all different variance decomposition methods are summarized in Table 1 and 2. Using all data from all 3 times points per day across all days, leads to a consistent set of results across all three variance decomposition methods (see Table 1). These results suggest that there is almost as much within-person variability as there is between-person variability. Thus, it would appear that vocational interest does vary as a function of quotidian experiences, in answer to research question 1.

One benefit of the G-theory method of variance decomposition is that it is able to estimate sources of variability due to the research design choices such as whether to use a randomized subset of items each time a survey is administered or using the same items at every survey administration. From Table 3, I note that using a random subset of item for each experience sampling time point does not introduce item specific variability, but rather introduces item by time variability. This is reasonable given that the items provided to respondents at each survey administration changes each time.

I note that a number of whole trait studies aggregate more than one survey administered per day to the day level. Accordingly, I applied the same variance decomposition methods to day-level RIASEC scores (Table 2). Generally, the density distribution and HLM variance decomposition methods yielded more between-person variability than within person variability,

suggesting that daily vocational interests do not vary as much compared to the within person-level, i.e., it is less likely that there are states of vocational interests. The estimates for between-person variability as a percentage of total variance were higher when estimated using G-theory. For example, using HLM results in a split of (30.06% within-person and 69.94% between-person variance) compared to G-theory estimates (23.16% within-person and 27.34% between-person variance). The density distribution method also yields higher estimates of between-person variability. This is counter-intuitive given that the within-person estimate using HLM is expected to be an *overestimation* because it includes extraneous sources of variance, e.g., the error. As highlighted, one possible explanation for these results is that the HLM method employed in this study (in alignment with previous Whole Trait Theory studies) surveys the trait three times a day but collapses 3 observations to a day level estimate of the trait, reducing the within-person variability present in the data. In contrast, G-theory utilizes the full set of observations without collapsing the observed scores at the day level.

Correlation between RIASEC global and RIASEC person-mean scores.

From Table 4, the overall correlation between RIASEC global and RIASEC person-mean scores were positive and reasonably strongly correlated ($r_{Investigative}$ = .59 to $r_{Enterprising}$ = .85). These results suggest that when people typically respond on a vocational interest inventory they are (in part) relying on the central tendency of prior vocational interest states over time—in line with other Whole Trait Theory research (e.g., Fleeson, 2017) and in support of *hypothesis 1a*.

Circular Unidimensional scaling

Results from CUS analyses of day-level scores suggest a pattern of RIASEC correlations that are consistent with Holland's (1997) structural hypotheses with the benchmark of R^2 = .60 as indicating good/strong fit (Armstrong, Hubert, & Rounds, 2003). Overall, the average across all

days was R^2 = .58 (R^2_{SD} = .08). Submitting global RIASEC scores to CUS also resulted in good conformation to a quasi-circumplex (R^2 = .64). These results suggest that applying Whole Trait Theory to estimating a person's vocational interest does not alter the substantive meaning of the construct, i.e., vocational interests (as defined by Holland's model) are still being measured despite the new operationalization of interests—in support of *hypothesis 1b*.

Stability of person-mean RIASEC scores

From Table 5, the correlations between person-mean RIASEC score from the 1st half the Study duration were very highly correlated with the person-mean RIASEC scores from the 2nd half. This provides further evidence that the central tendency RIASEC scores obtained from an experience sampling approach exhibits the expected high degree of between-person vocational stability (Low et al., 2005)—in support of *hypotheses 1c*.

Supplementary analyses

In addition to the main analyses conducted, two separate supplementary analyses were conducted for Study 1: (1) the within-person variability of the general factor of vocational interests and (2) examining whether time of day or day of the week provides an explanatory account for why social interests might vary as function of time.

In assessing variability of vocational interests, the possibility exists of assessing the degree to which the general factor of interests can vary as a function of daily experience. Examining the variability of the general factor is of import when examining the variability of interests, given that it can account for up to 40% of variance in interest scores. And although the interpretative meaning of the general factor has been debated, more recent work argue that it contains substantive meaning: a general tendency to 'like' stimuli and is worthy of consideration (Tracey, 2012; Wee, 2016). Accordingly, I also examined the variability of the general factor in

Study 1. The general interest factor was operationalized as the profile evaluation across the six RIASEC sub scales at each time for both density distribution and HLM methods of variance decomposition. From Table 2, it appears that similar to the RIASEC factors, there is as much between-person variability as there is within-person variability. For generalizability theory, I analyzed the general factor of interest by including all the items from the RIASEC subscales. From Table 3, the results were comparable to the density distribution and HLM methods, with slightly more between-person variability (9.60%) compared to within-person variability (7.58%). Of note is the utility of G-theory method to estimate the percentage of total variance from using items from different subscales as item specific variance (Item σ =12.84%) due to heterogeneous content and greater item by time variance (Item × Time σ = 11.52%) due to different subsets of items used at each administration.

An assertation of Whole Trait Theory is that there are explanatory variables that can account for the variability of a trait-like construct. To that end, I examined whether the time when the survey was administered (Day of the week and time of day) predicted social interests. Social interests were selected because both evenings and weekends provided increased opportunities to engage in non-work related social activities and environments (Sonnentag, 2001); correspondingly the increased opportunities for social contexts may serve to activate or elicit a person's social interests, e.g., activities linked to caring and nurturing family and friends (Helliwell & Wang, 2014). Similar opportunities for increased social activity opportunities are also possible regarding time of day; people may have more time to engage in non-work social opportunities in the evenings as opposed to the mornings and afternoons. Day of the week was recoded as a (level 2 fixed effect) categorical variable and recoded using effects coding with Wednesday set as the base group. Time of Day was recoded as a (level 2 fixed effect) categorical

variable and recoded using effects coding with Morning set as the base group. Results from Table 6 indicate that that although there was no time of day effect found, there was a small effect of day of the week (Fridays) which predicted people's interests (γ_{40} = .08, p =.02). It is curious that other days of the weekend (Saturday and Sunday) did not exhibit a similar predictive effect; it could be that social interests are increased on Friday when there is anticipation of the social activities over the weekend rather than during the weekend itself. Alternatively, it could be that students stack their social activities on Friday leaving Saturday and Sunday for either recovery (from Friday activities) or for work related tasks. This Friday effect is consistent with other day of the week effects such as those found with mood: there is an elevation of mood only Fridays but not the weekend (Stone, Schneider, & Harter, 2012).

Discussion

The overarching goal of Study 1 was to examine the degree to which vocational interests varied over a short period of time; or, said differently the degree to which vocational interests can fluctuate like a state. In answer to research question 1, I found that the vocational interests do indeed vary as a function of time. Results from three variance decomposition methods generally found that there is a non-trivial level amount of within-person variability—almost the same degree as between-person variability. This suggests that vocational interests can be represented not only as trait-like, but also state-like in line with Whole Trait Theory (Fleeson & Jayawickreme, 2015).

In support of the application of Whole Trait Theory to vocational interests, I find support for hypotheses 1a: Vocational interest global scores (baseline score representing how people typically respond to interest inventories) are positively and strongly related to the central tendency of people's average interest scores over time. This suggests that when people respond

on interest inventory scales, they are responding based on inferences regarding the central tendency of their interest levels from the past. Further support for the application of Whole Trait Theory is found from the inter-relationships between the RIASEC factors which still exhibit structural properties expected of a quasi-circumplex representation, in support of hypothesis 1b. Measuring vocational interests using Whole Trait Theory does not seem to affect the spatial hypothesis with structural expectations that is diagnostic as to whether vocational interests have been measured. Finally, results indicate that the stability of interests between in week 1 and week 2 was generally high—evidence that interests do vary over time, but this variability does not conflict with previous studies indicating high between-person stability (Low et al., 2005).

Two limitations arose in Study 1. First, for G-theory variance decomposition, the variance attributed to items was zero. This is unlikely, given that the participants responses indicated variability. More likely, G-theory estimation yielded negative variability. Since this is theoretically not possible—the variance was set to zero. Accordingly, the variance attributed to items should be interpreted with caution. Second, it is noted that the correlations between RIASEC factors such as E and C were high and positive. Although these two are expected to be positively related, effect sizes range r = .60 - .75 indicate problems with the discriminant validity between these two constructs. However, given that the participants were 1st year undergraduates the high correlation between E and C may be due the lack of perceiving the distinctiveness in item content of enterprising and conventional factors since both items refer to an administrative and business work environment.

Overall, Study 1 demonstrated that vocational interests, when examined through the lens of Whole Trait Theory, exhibit both short term within-person variability and between-person properties consistent with the larger predominantly between-person interest literature (e.g.,

structural validity). However, Study 1 lacks an investigation of how examining vocational interests using Whole Trait Theory may affect its relationship with other traits that are in its nomological network. Accordingly, the goal of Study 2 is to examine whether the nomological relationships between interest and personality traits are maintained when using the whole trait approach.

STUDY 2: COMPARISON BETWEEN VOCATIONAL INTEREST AND PERSONALITY

The goal of Study 1 was to provide an initial estimate of between-and within- variability of vocational interests. The purposes of Study 2 are twofold. First, Study 2 allows the replication of several results of Study 1: the relations between the global score and the person-mean scores and the biweekly stability of the person-mean scores. Second, I also examine whether the nomological relationships between interests and personality (at the between-person level) are preserved when examined via ESM. If the relationships between the two sets of individual differences are retained, then it provides additional evidence that the centrality parameter estimates of a person's ESM responses are indeed an indicator of his/her (global) interests. Correspondingly, it would provide further evidence for Whole Trait Theory as an appropriate conceptualization of a person's interests.

Examining the within-person variability and nomological network from the full range of interest and personality traits presents a unique challenge to ESM studies. Because respondents are required to fill in questionnaires frequently, the upper bound for the number of items that can be administered at a time is more constrained (Dimotakis, Ilies, & Judge, 2013). Accordingly, I sought to prevent survey fatigue and related issues such as subsequent non-compliance and reduced data quality. To prevent survey fatigue, not all traits were examined simultaneously. The selection of a subset of interest and personality traits was guided by two considerations.

The selection of a subset of interest and personality factors was guided by two considerations. The first consideration focuses on the comparison of expected relationship between interests and personality. Given item constraints, I selected two personality traits that have demonstrated some of the stronger relationships with vocational interest domains: extraversion and openness to experience (Larson, Rottinghaus, & Borgen, 2002; Mount, Barrick,

Scullen, & Rounds, 2005). The second consideration concerns the between person-level relationship between interests and personality. I selected traits to demonstrate convergent and divergent validity (Campbell & Fiske, 1959). Previous attempts to form theoretical links between interests and personality have used an adjective matching approach (Hogan & Blake, 1999). This approach is based on how Holland's (1997) model of interests and the big five model of personality (McCrae & Costa, 2008) have both used adjectives to define their typologies. In line with this approach, the selection of which interest and personality traits to include was informed by both the theoretical nature of the traits and previous meta-analytical estimates of the inter-relationship (Larson et al., 2002; Mount et al., 2005). Specifically, I selected enterprising, social, and artistic interest. Interest and personality traits that share greater theoretical overlap are expected to be more strongly related than traits with little or no theoretical overlap.

The second consideration concerns the between person-level relationship between interests and personality. I selected factors from both sets of traits to demonstrate convergent and divergent validity (Campbell & Fiske, 1959). Previous attempts to form theoretical links between interests and personality have used an adjective matching approach (Hogan & Blake, 1999). This approach is based on how Holland's (1997) model of interests and the big five model of personality (McCrae & Costa, 2008) have both used adjectives to define their typologies. In line with this approach, the selection of which interest and personality factor to include was informed by both the theoretical nature of the factors as well as previous meta-analytical estimates of the inter-relationship (Larson et al., 2002; Mount et al., 2005). Specifically, I selected enterprising, social, and artistic interest; in addition to the personality traits selected. Interest and personality factors that share greater theoretical overlap are expected to be more strongly related, whereas factors with little or no theoretical overlap are expected not to be related.

Enterprising interests with personality

Enterprising interests encompass liking activities, people, and environments that involve the persuasion of *others* (a social component, Prediger, 1982), high dominance motivation, and risk-taking (Holland, 1997). Similarly, extraversion is related to achievement motivation and risk-taking aspects such as assertiveness, agency, and excitement seeking (McCrae & Costa, 2008). Based on the considerable theoretical overlap, enterprising interests and extraversion are expected to be positively related. In contrast, enterprising interests should have a weak relationship with openness. The openness factor encompasses aspects such as an active imagination and aesthetic sensitivity, which do not seem to have much theoretical overlap with extraversion. Meta-analytic estimates support these assertions, ($\rho_{enterprising\text{-extraversion}} = .40$, $\rho_{enterprising\text{-}openness} = .05$; Mount et al., 2005).

Hypothesis 2a. Enterprising interests are positively related to extraversion.

Hypothesis 2b. Enterprising interests are not related to openness.

Social interests with personality

Social interests refer to a preference for activities, people, and environments which involve assisting, caring, and helping others (Holland, 1997). Thus, social interests have a people/other-focused theoretical aspect that is shared with extraversion's warmth and sociability aspects. However, unlike enterprising interests, social interests do not have an dominance motivation. Accordingly, based on theoretical overlap, social interests are expected to be positively related to extraversion, but the social-extraversion relationship should be smaller in magnitude than the enterprising-extraversion relationship given the smaller theoretical overlap. Social interests are expected to have a weak relationship with openness given the lack of

theoretical overlap. Meta-analytic estimates support these assertions, ($\rho_{social\text{-extraversion}} = .29$, $\rho_{social\text{-}openness} = .13$; Mount et al., 2005).

Hypothesis 2c. Social interests are positively related to extraversion.

Hypothesis 2d. Social interests are not related to openness.

Artistic interests with personality

Artistic interests entail the liking of activities, people, and environments that involve self-expression including design and crafting (Holland, 1997). Artistic interests share considerable theoretical overlap with openness: both centrally feature imagination, exploration and aesthetics (McCrae & Costa, 2008). Correspondingly, based on the theoretical overlap, the relationship between artistic interests and openness are expected to be positive. In contrast, there is little theoretical overlap between artistic interests with the motivational, or risk-taking aspects of extraversion; artistic interests should have a weak relationship with extraversion. Meta-analytical estimates of these relationships indicate a moderate relationship between artistic interests and openness and a weak relationship between artistic interests and openness ($\rho_{artistic\text{-}openness} = .41$ $\rho_{artistic\text{-extraversion}} = .09$; Mount et al., 2005).

Hypothesis 2e. Artistic interests are positively related with openness

Hypothesis 2f. Artistic interests are not related to extraversion.

Methods

The methods for Study 2 were similar to Study 1. As such, a simplified description is provided but with any differences between the two studies highlighted.

Participants. Study 2 consisted of 54 participants who were psychology students (M_{age} = 19.57, SD_{age} = 1.31) recruited from a large mid-western University. Forty-nine participants completed at least three of the 30 surveys administered (Mean survey = 18.45, Median survey =

22). In total there were 1421 survey observations, after daily surveys were removed due to failing quality control items. Students received course credit in exchange for participation. The sample was predominantly female (68%), with a majority being Caucasian (53%), followed by Asian (30%), Hispanic (15%), Black (5%), Pacific Islander (3%), and other (2%)—note the demographic survey allowed for the selection of more than 1 ethnicity.

Procedure. The Study 2 followed a similar procedure to Study 1. It consisted of two parts: a baseline survey completed prior to the daily survey and a daily survey completed three times a day for 10 consecutive days (starting on Monday and ending on Wednesday). ESM surveys were administered via email links at 2pm, 4pm, and 8pm with a 2-hour window for participants to respond. Unlike Study 1, Study 2 did not randomly select a subset of items from a large pool of items; instead, the same items were presented for each daily survey. Each day participant responded on 6 items for each enterprising, social, and artistic domain and 6 items from each personality factor (extraversion and openness).

Measures. Unlike Study 1, only a subset of RIASEC domains was examined: enterprising, social, and artistic interests. At baseline, participants completed an interest measure consisting of 24 items (8 items per interest domain) from the public domain RIASEC markers (Armstrong et al., 2008). Participants responded on a 5-point scale (1= Strongly dislike to 5 = Strongly like) the degree to which they would like to do the activity. Participants were also asked not to take into consideration their education or training as well as how much money they would make from doing the activity. See Appendix B for items.

Extraversion and openness were assessed using items from the Goldberg's Markers for Big Five scale (1992). Goldberg's Markers are public domain and widely used in whole trait personality research (e.g., Church et al., 2011; Fleeson, 2001). The scale consists of adjectives

and respondents rate the extent to which they agree that the adjective describes them. Participants rated the degree to which each adjective accurately described them on a 7-point bipolar scale (1 = Very inaccurately to 7 = Very accurately). See Appendix B for items.

Analyses. This section includes explanations of how various scores were calculated, analyses used, and (where relevant) formulas.

Variance partitioning. As with Study 1, the same three variance partitioning techniques were used to partition the total variance into between- and within-person variability.

Global interest and personality scores. Enterprising, social, and artistic interests and extraversion and openness global scores were calculated using the mean score for each interest and personality subscale obtained at baseline.

Time point interest and personality score. The time point level scores was calculated taking the mean of responses for each time point for each participant. Because Study 2 ran for 10 days each with 3 surveys (morning, afternoon, and night) each participant could potentially receive 90 interest scores and 60 personality scores.

Day-level interest and personality scores. The day-level enterprising, social, and artistic interest as well as extraversion and openness scores were calculated by taking the mean of participant responses for each interest and personality subscale within the same day (aggregated across sessions within day). Because Study 2 ran for 10 days, each participant could potentially receive 30 interest scores and 20 personality scores.

Person-mean scores. The person level enterprising, social, and artistic interest and extraversion and openness person-mean scores were calculated using the mean day level subscale score across 10 days. Each participant would have 5 scores, one for each interest and personality factor.

Stability. The bi-weekly stability of interests and personality was examined by correlating the person level interest or personality score from the first half of the ESM study period (day 1 to day 5) to their person level interest score from the second half of the study period (day 5 to day 10). I also examined the comparability of global scores with the person level ESM estimates of central tendency by correlating global interest and personality score with the corresponding person level interest and personality score.

Results

Variance decomposition of vocational interests

Results from the different variance decomposition methods are summarized in Table 7. Variance decomposition results using all time points resulted in findings for density distribution HLM, and G-theory that were generally similar; there was more variability in within-person variability than between-person variability. This suggests (as with Study 1) that there is at least as much within-person variability as between-person variability for vocational interests. These results provide support that vocational interests vary as a function of quotidian experiences.
In contrast to Study 1 that used a random subset of items drawn from a larger pool of items, Study 2 administered the same items at each occasion. The administration of a fixed set of items in Study 2 was observed to result in greater person by item variability (See Table 9). Person by item variability refers to a person's idiosyncratic responses to the item content from the same scale distinct from the trait the scale purports to measure (Appendix A). A person might idiosyncratically have particular like or dislike affective preference for an element in the survey. For example, for the artistic scale item: "paint sets for plays" a person might have a particular dislike for painting related artistic activities but have no problems with other artistic activities related to music or acting (Appendix B). Germane to the results of the Study 2, administering the

same items repeatedly does not result in item by time interaction variability (people change their responses to the same items over time, potentially because of boredom) but rather allows the capturing of peoples' idiosyncratic responses to particular items. Of note, the information provided by the person by interaction variability is not available using other decomposition methods such as HLM or the density distribution approach. Indeed, part of this variability is lost because the more commonly methods of HLM and density distribution aggregate individual items to the scale level—correspondingly such nuance is lost in the aggregation process. Finally, the random selection of items in Study 1 also may have resulted in greater person by time variability, likely due to the changing item content at each time point. In either case, the utility of G-theory is apparent in its ability to quantity the variability attributable to how a survey is administered.

In line with previous studies, I also subjected day-level interests scores to variance decomposition. Similar to Study 1, the density distribution and HLM variance decomposition methods suggest there to be more between-person variability than within person variability. In contrast, G-theory methods indicate that there is slightly more within-person variability than between-person variability. As with Study 1, this may be because the density distribution approach commonly employed aggregates multiple observations per day and thereby underestimates the within-person variability.

Correlation between interest global and interest person-mean scores.

As shown in Table 10, the correlations between interest global and interest person-mean scores were highly correlated ($r_{Enterprising}$ = .51 to $r_{Artistic}$ = .72). These results are in line with Study 1 and in support of hypothesis 1a, suggesting that people responding on vocational interest inventories provide their responses on the central tendencies of their vocational interest states.

Stability of person-mean interest scores

From Table 5, the correlations between person-mean interest scores from the 1st half the Study duration (5 days) were very highly correlated with the person-mean interest scores from the 2nd half. In support of hypotheses 1c, these results are similar to Study 1 and provide evidence that the central tendency scores obtained from an experience sampling approach exhibits the expected high degree of between-person stability.

Nomological relationships between interests and personality

A central goal of Study 2 was to examine whether the between-person relationships between interest and personality held when estimating a person's vocational interests using a Whole Trait Theory perspective. Overall, the results supported the convergent and discriminant relationships expected from meta-analytic estimates. In support of hypotheses 2a and 2b, Enterprising interests were positively related to extraversion and weakly related to openness ($r_{Enterprising\text{-}extraversion}$ = .58; $r_{enterprising\text{-}openness}$ = .16) which are comparable to meta-analytic estimates ($\rho_{Enterprising\text{-}extraversion}$ = .40, $\rho_{Enterprising\text{-}Openness}$ = .05; Mount et al., 2005).

Social interests were positively related to extraversion and weakly related to openness ($r_{Social\text{-}Extraversion}$ = .31; $r_{Social\text{-}Openness}$ = .14) compared to meta-analytic estimates ($\rho_{\ Social\text{-}Extraversion}$ = .29, $\rho_{\ Social\text{-}Openness}$ = .13; Mount et al., 2005) in support of hypotheses 2c and 2d respectively.

Finally, artistic interests were positively related to openness and extraversion ($r_{Artistic\text{-}Openness}$ = .39; $r_{Artistic\text{-}Extraversion}$ = .33) compared to meta-analytic estimates ($\rho_{Artistic\text{-}Openness}$ = .41, $\rho_{Artistic\text{-}Extraversion}$ = .09; Mount et al., 2005)—in support of hypotheses 2e but not hypothesis 2f. It is possible that the stronger relationship observed between artistic interests and extraversion might be due to the student population used in this study; they might more closely associate

preferences for artistic activities with extraversion (social contexts), e.g. singing and acting in student extracurricular activities.

Supplementary analyses

In addition to the main analyses, three additional exploratory supplementary analyses were conducted for Study 2: (1) the within-person variability of the general factor of vocational interests and personality, (2) variance decomposition of personality variables, and (3) examining time of day and day of the week as explanatory variables for why social interests might vary. One important caveat in interpreting the variance decomposition of personality and interests is that they may not be directly comparable given that in both cases, the constructs are not scaled to have equivalent variances between constructs—caution is advised.

I examined the variability of the general factor of interests. Although only a subset of the full RIASEC is measured in Study 2, because the general factor of interest is found across all RIASEC factors (Rounds & Tracey, 1993; Tracey, 2012), the three domains of interest examined can serve as an indicator of the general factor of interests. Results from the variance decomposition methods using all time points, finds that the general factor does not vary to a great degree (Table 8). Compared to other domains of vocational interest, the general factor shows little variability. This low level of variability with the general factor is similar to the results of the general factor in Study 1.

The assessment of extraversion and openness in Study 2 opens the possibility of exploring the properties of one of the two higher order factors of personality—Plasticity. Plasticity is a higher order trait linked to personal growth and includes exposure to and incorporation of novel information (DeYoung, 2006). To date, Plasticity has not been examined from the perspective of Whole Trait Theory. Results from the variance decomposition using all

time points shows that there is a considerably more within-person variability in Plasticity compared to between-person variability (Table 8). This is perhaps not surprising given that Plasticity entails the exploration and incorporation of novel information from the environment; situational variables are thus might be more likely to activate these traits.

I also applied the variance decomposition methods to personality variables. The variance decomposition of extraversion exhibited greater within person variability than openness (Table 6 and 7) regardless of whether day-level aggregation or all time points were used. This is consistent with previous whole trait studies that find extraversion generally to be the most situationally dependent personality factor compared to other factors such as openness (Fleeson, 2001; Judge et al., 2014).

Similar to Study 1, I also examined whether time of day and day of week could serve as an explanatory variable for social interests. As shown in Table 11, results from the HLM shows Mondays to negatively predict social interests (γ_{10} = -.12, $p < .001$). This is contrast to Study 1, which found a Friday effect, but is consistent with other day of week effects such as those for affect (Stone et al., 2012). The differences between the two studies may, in part, be attributed to the differences in length of the studies (14 days vs 10 days).

Discussion

The goals of Study 2 were firstly to replicate several of the results obtain from Study 1, and second to examine if the nomological relationships between interests and personality were retained when operationalizing a person's vocational interest as the central tendency of their density distribution. As with Study 1, results from Study 2 indicate that vocational interests do vary across time. Results from three variance decomposition methods suggest that a person's vocational interests do fluctuate over even a short period of time—at times to a greater degree

than at the between-person level of variability. This slightly higher within-person than between-person variability of Study 2 may, in part, be attributed to consistency motif method bias as participants respond to both personality, which is more variable, and vocational interest at each survey administration (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Results from Study 2 also provided further support for the application of Whole Trait Theory to vocational interests. Overall, I found support for both hypothesis 1a (global scores correlate strongly with person-mean scores—indicating that when people respond to interest scales, they infer their vocational interest trait level based on an aggregation of past vocational interest tendencies. The stability of interests between the 1st and 2nd halves (5 days each) of the study duration is also reasonably high, providing support that although there is some variation across short time intervals, the between person stability of vocational interests remains robust.

The second goal of Study 2 was to investigate—beyond the expected inter-relationships between RIASEC categories explored in hypothesis 1c of Study 1—whether other nomological relationships between interest and traits (personality) were maintained. Overall, the results from Study 2 show the expected convergent and divergent relationships between enterprising, social, and artistic interests with extraversion and openness. This is encouraging because it provides support for an ESM (Whole Trait Theory) operationalization of vocational interests, and importantly does not contradict previous findings from between-level research on personality and interests. Consequently, this provides impetus for exploring the relationship between vocational interests with other work relevant constructs such as job satisfaction.

STUDY 3: VOCATIONAL INTEREST WITHIN-PERSON VARIABILITY WITH AN EMPLOYEE SAMPLE

Studies 1 and 2 sought to examine the applicability of a whole trait conceptualization to vocational interests. Study 3 sought to overcome some limitations of generalizability when using a student sample by investigating the same phenomena in employees embedded within different jobs. Vocational interests have been primarily examined in vocational psychology and career counseling, Study 3 examines vocational interests in the workplace. The purpose of Study 3 is twofold and are discussed in turn.

Within-person variability using employee responses

The first purpose of Study 3 is to replicate the findings for hypothesis 1a through 1c and research question 1, using an employee sample. A limitation imposed on the generalizability of Study 1 and 2 findings is the reliance on vocational interest scale responses from students who have often not been fully employed.

Activity congruence and job satisfaction

The second purpose of Study 3 is to examine the relationship between interest congruence (fit) and job satisfaction at a within-person day level. Holland (1997) proposed the congruence hypothesis that when a person is in an environment that matches their interests, they are going to be more satisfied. This relationship between interest congruence and job satisfaction is central to Holland's (1997) theory of vocational interest, but meta-analytic evidence for this expected relationship has been weak (Assouline & Meir, 1987; Tsabari, Tziner, & Meir, 2005). This has led some researchers to posit that the congruence-satisfaction relationship is a 'myth' (Tinsley, 2000) or that the measurement and statistical artifacts contribute to the difficulty in finding empirical support (Spokane, Meir, & Catalano, 2000). Emerging research attempting to

correct for these issues finds that the relationship between interests and satisfaction does become significant, but the effect size is much smaller than expect (r = .09; CI [.06, 12], Song, Wee, Earl & Rounds, 2016).

One of the reasons for the weak relationship between interest-environment congruence and job satisfaction is due to the suboptimal operationalization of person-environment fit. Attempting to test Holland's (1997) congruence hypothesis using current measures of person interests and environment interests presents a number of concerns about whether congruence, as it was theorized, has been evaluated. Holland argued that person-environment fit operates to produce greater satisfaction, in part, because the work environment provides tasks (i.e., activities) similar to the person's preferences for these activities: Interest congruence entails the matching of a person's interest (activity preferences) to work activities.

Current research on congruence is commonly determined by fitting the person RIASEC score to the occupation's RIASEC score. However, occupations often encompass a broad heterogeneous mix of work activities that vary with frequency in which an employee works on the activity and importance of the activity to the occupation. Consider the work activities of high school teacher. Intuitively, the work activity most related to the teaching profession would be the actual time spent instructing or coaching students—work activities that would match a person with high social interests. Yet, teachers engage in other work activities that are not *social* activities, such as administrative paper work, which are necessarily tasks. The ESM design of Study 3 assesses activity congruence as the person (daily activity preferences)-environment (daily activities provided).

Germane to the congruence hypothesis, activity congruence may be a better way to study vocational interests' link with satisfaction. Experimental studies examining how activities (or

work tasks) relate to satisfaction indicate satisfaction as dependent on whether people like the activities they are engaged in (Locke, 1965); a set of findings that have been well replicated (Korman, 1968; Leonard & Weitz, 1971; Locke, 1966, 1967). Satisfaction with one's work seems dependent on whether the work activity people are engaged in match their activity preferences for what they enjoy or like, i.e., activity congruence.

The multiple daily sampling presents an opportunity to examine the relationship between activity congruence and satisfaction by spacing out the measurements of interests, work activity, and satisfaction. This temporal separation between predictor and criterion improves the strength of causal inference (Cook, Campbell, & Shadish, 2002).

Hypothesis 3. Activity congruence is positively related with job satisfaction.

Methods

The methods for Study 3 were generally similar to Studies 1 and 2.

Participants. Study 3 participants were recruited online from postings on Craigslist (see https://craigslist.org/about/sites), Alumni boards, and Reddit (see https://about.reddit.com/). A majority of the participants who responded were from Craigslist ads placed in several large cities (e.g., Chicago, Detroit, and New York). 217 initial respondents who were interested contacted the researcher directly and were given a screener survey with several demographic questions. If participants identified as full-time employees and were able to provide a job title and a detailed description of their job tasks, they were enrolled in the study (N = 68). After quality controls, fifty-five participants completed at least three of the 30 surveys (Mean = 26.89 surveys, Median = 28 surveys). In total there were 1479 survey observations. All participants' Internet Protocol addresses were verified to ensure that they were located in the United States and that each participant was a unique individual. One participant indicated an irregular work schedule, the

survey times were adjusted to make the surveys more appropriate. Participants lived in 18 different states and worked in 24 different industries. The sample worked a mean of 38.37 hours a week (*SD* = 5.18 hours), with a mean tenure of 6.70 years (*SD* = 1.51 years) and were on average 32.45 years of age (*SD* = 6.93 years). The gender of this sample was more balanced than the student sample (56% male). Generally, these employees were educated: 62% had earned bachelor's degree or higher. The employees held a wide variety of job titles, including attorneys, information technology managers, real estate agents, office assistants, cashiers, video editors, and biologists. A majority this sample was Caucasian (78%), followed by Asian (3%), Hispanic (9%), Black (9%), and other (1%). Participants were compensated with a USD$20.00 gift card. In addition, every completed daily survey gave participants a chance to with an additional USD$50.00 and USD $150 gift card at the end of the 1st and 2nd week respectively.

Procedure. Study 3 consisted of two parts: a baseline survey and a daily survey. The daily survey duration was two weeks (14 days), but only included consecutive business days (10 days), starting on Monday and ending on Friday. The surveys were always emailed at the same time each day, adjusted for time zone differences, (morning survey at 7 am; mid-day survey at 1 pm; evening survey at 6 pm) and were open for a three-hour window. During the 1st survey, participants asked to complete a vocational interest scale. During the 2nd survey participants reported on up to 3 work activities they completed during the 1st half of the day. These work activities are necessary for subsequent coding into the RIASEC aspects. Participants also rated their positive and negative affect. The evening survey asked participants to reflect upon their workday and to report their work satisfaction. As with previous studies, each survey contained quality assurance items that ask participants to select a specified response. The contents of each survey are discussed in turn.

Control variables. I controlled for positive and negative affectivity in tests of the congruence hypothesis, given the relationship between positive and negative affect with job satisfaction (Gabriel, Diefendorff, Chandler, Moran, & Greguras, 2014; Gerhart, 2005).

In addition, the degree that a person is able to pursue the activities of his/her choosing depends on the nature of the occupation. People with greater autonomy may be able to select activities that match their interests (and accordingly have higher congruence) resulting in higher job satisfaction (Dodd & Ganster, 1996).

Finally, work related affect like job satisfaction exhibit cyclical patterns (Weiss, Nicholas, & Daus, 1999). As such, to control for potential weekday effects I included day of the week as a set of categorical variables with Wednesday as the base group. Results for the analyses with the control variables and model comparisons are reported along with the base model.

Measures. For Study 3, participants reported their vocational interests, positive and negative affect at baseline. Because this study involved employees, I sought to reduce the burden of responding on working adults as they headed for work and while they were at work. To that end, for the 1st daily survey vocational interest was measured using the newly develop miniature Interest Profiler (Mini-IP; Rounds, Ming, Cao, Song, & Lewis, 2016). This inventory consists of 5 items per RIASEC domain. Participants responded on a 5-point scale (1= Strongly dislike to 5 = Strongly like) rating the degree to which they would like to do an activity, without taking into consideration, their education or training as well as how much money they would make from doing the activity. The item order was randomized.

For the middle of day, I measured participant current affect using a 10 item scale (five positive and five negative affect terms; Mackinnon et al., 1999). Participants rated the extent to which they felt each emotion (1 = very slightly or not at all to 5 = extremely). Participants also

reported up to three work activities that they completed since the start of the day. They were asked to report each activity in as much detail as possible. For example, instead of reporting the work task "responded to emails", participants were encouraged to provide more detail: "responded to client emails persuading them to confirm invoice sent."

At the end of day, participants were asked to reflect on their day before reporting on their work satisfaction. To measure work satisfaction, I used the work subscale of the abridged job description inventory (Stanton et al., 2002); this scale lists a set of six adjectives that could be used to describe work in a job. Participants responded on a three-point scale (Yes, "?", and No), whether the listed adjective was descriptive of their work. Responses were coded according to the JDI manual (Balzer, Smith, & Kravitz, 1990).

Other constructs measured at baseline, and in at end of day survey included: burnout (Lerman et al., 1999), organizational citizenship behavior (Lee & Allen, 2002), withdrawal (Lehman & Simpson, 1992), and in role task performance (Williams & Anderson, 1991). In addition, during the midday survey, participants reported their satisfaction and in role performance of the work they completed. All these constructs were measured but not used for the purpose of this dissertation.

Analyses. This section includes explanations of how various scores were calculated, and analyses performed.

Variance partitioning. The three-variance partitioning techniques were used to partition the total variance into between- and within-person variability for vocational interest and positive and negative affect.

Global RIASEC score and positive and negative affect score calculation. Global scores were calculated using the mean score for each subscale obtained at baseline.

Day-level RIASEC scores and positive and negative affect scores. The day-level score was calculated taking the mean of responses within the same day for each participant. Because Study 3 ran for 10 days, each participant could potentially receive 60 RIASEC scores (10 days by 6 RIASEC scale scores), 10 positive, and 10 negative affect scores.

Person-mean interest scores and, positive and negative affect scores. The person level RIASEC score was calculated using the mean day level score across 10 days. Each participant would have one for each RIASEC domain (6 vocational interest scores), and 2 affect scores (1 each for positive and negative affect).

Stability. As with Study 1 and 2, the stability of interests and affect were assessed in two ways: the bi-weekly stability (the correlation between the RIASEC global scores from the 1st week with the RIASEC global scores from the 2nd week) and the correlation between their RIASEC global scores with their person-mean scores.

Coding work activities and autonomy. Occupations are multi-dimensional and can be coded according to the degree each RIASEC domain is reflected in the occupation (Kroustalis et al., 2010). Activities were coded according the RIASEC interest characteristics of the work. Each activity was evaluated according to how much it reflected each of the 6 RIASEC domains. For example, the activity: "Trained a new analyst in how to use a discounted cash flow analysis program", can be evaluated as: (1) high social interest (teaching); (2) moderate conventional interests (organization of information; data), enterprising (directing a new analyst) interests, and investigative (analysis); and (3) reasonably low in realistic and artistic interest. Each activity is rated on a 5-point scale regarding how representative each occupation is (1 = not representative to 5 = very representative). Activities were coded by the author and an experienced research assistant, inter-rater reliability was high (r = .82), the final activity score was taken as the

average interest score between the two raters in line with previous rating of RIASEC work environment (Rounds, Smith, Hubert, Lewis, & Rivkin, 1999).

Autonomy for each occupation was obtained by matching the occupational title and occupational activity description with the corresponding occupation on the occupational information network (Rounds, Armstrong, Liao, Rivkin, & Lewis, 2008). For example, an accountant would not have a high level of autonomy in their occupation, whereas a real estate agent would.

Operationalizing activity congruence. There are many ways to examine the link between activity congruence and satisfaction that center around how congruence is operationalized. Study 3 examines this link with three methods: *traditional*, as a multi-level interaction, and using matched scores. Under the traditional approach, the congruence between person and environment interest characteristics is represented by an index. For the purposes of this study, this congruence index was obtained by calculating the (Pearson) profile correlation between a participant's day level RIASEC score and the RIASEC score of their work activity. For a profile correlation -1 and 0 represent mismatch and no match, respectively and +1 represents a perfect match between their RIASEC profile and the activity (Kroustalis, Lewis, & Rivkin, 2010). Because there were 10 work-days, each participant could potentially have 10 profile correlations, one for each day. To examine the congruence hypothesis using (person centered) profile correlations to predict job satisfaction, I used the following HLM model:

Level 1: $\text{Satisfaction}_{ti} = \beta_{0i} + \beta_{1i}(\text{Daily congruence}_{ij} - \overline{\text{Daily congruence}_i}) + r_{ij}$ (8)

Level 2:

Intercept: $\beta_{0i} = \gamma_{00} + \gamma_{01}(\overline{Daily\ congruence_i}) + u_{0i}$ (9)

Within person congruence: $\beta_{1j} = \gamma_{10}$ (10)

Combined: $\text{Satisfaction}_{ti} = \gamma_{00} + \gamma_{01}(\overline{Daily\ congruence}_i) + \gamma_{10}(\text{Daily congruence}_{ij} - \overline{\text{Daily congruence}}_i) + u_{0i} + r_{ij}$ (11)

A person's level of satisfaction is predicted by two multi-level main effects. First, a within-person main effect of activity congruence (γ_{10}) at level 1: higher levels of daily activity congruence are expected to positively predict work satisfaction. Second, a between-person main effect of activity congruence (γ_{01}) at level 2: higher levels of congruence between people are expected to positively predict work satisfaction. The modeling of the level 2 effect accounts for the between-person effects of in predicting work satisfaction—this is similar to how the congruence hypothesis is currently examined at a between person level using a fit index.

The second way of conceptualizing congruence is as an *interaction* between two continuous time-varying predictor variables predicting satisfaction. Rather than investigating congruence as a single index of fit, congruence is conceptualized as the interaction between an individual's interest factor (e.g., realistic) and the corresponding interest factor of the work activity they are engaged in. In contrast to the congruence indices, the prediction of satisfaction using the interaction term is the test for the congruence hypothesis. Congruence is tested by the following model, using realistic interest as an example:

Level 1: $\text{Satisfaction}_{ti} = \beta_{0i} + \beta_{1i}(\text{Daily RP}_{ti} - \overline{\text{Daily RP}}_i) + \beta_{2i}(\text{Daily RE}_{ti} - \overline{\text{Daily RE}}_i) + \beta_{3i}(\text{Daily RP}_{ti} - \overline{\text{Daily RP}}_i)*(\text{Daily RE}_{ti} - \overline{\text{Daily RE}}_i) + r_{ti}$ (12)

Level 2:

Intercept: $\beta_{0i} = \gamma_{00} + \gamma_{01}(\overline{\text{Daily RP}}_i) + \gamma_{02}(\overline{\text{Daily RE}}_i) + u_{0i}$ (13)

Within-person realistic person: $\beta_{1i} = \gamma_{10} + u_{1i}$ (14)

Within-person realistic activity: $\beta_{2i} = \gamma_{20} + u_{2i}$ (15)

Within-person realistic person by activity: $\beta_{3j} = \gamma_{30} + u_{3i}$ (16)

Combined equation: $\text{Satisfaction}_{ti} = \gamma_{00} + \gamma_{01}(\overline{\text{Daily RP}_i}) + \gamma_{02}(\overline{\text{Daily RE}_i}) + \gamma_{10}(\text{Daily RP} - \overline{\text{Daily RP}_i}) + \gamma_{20}(\text{Daily RE}_{ti} - \overline{\text{Daily RE}_i}) + \gamma_{30}(\text{Daily RP}_{ti} - \overline{\text{Daily RP}_i})*(\text{Daily RE}_{ti} - \overline{\text{Daily RE}_i}) + u_{0i} + u_{1i} + u_{2i} + u_{3i} + r_{ti}$ (17)

Note that because there are six RIASEC domains the HLM analyses is calculated 6 times—one per domain. For each model run, satisfaction is predicted by four predictors, multi-level main effects and an interaction effect. Two between-person main effects for person interest scores (γ_{01}) and daily activity scores (environment, γ_{02}) are the mean person and activity interest score across observations. Two within-person main effects for daily person interest scores (γ_{10}) and daily activity scores (environment, γ_{20}) are the (person-centered) person and activity interest scores from the day. Finally, an interaction term is the between a person daily interest with their daily activity. A significant interaction term indicates that for the corresponding RIASEC domain, the relationship between people's daily (RIASEC) and their daily satisfaction is moderated by their daily (RIASEC) work activity, such that the relationship between daily interest and daily satisfaction is strong when daily activity is higher than when it is lower.

Finally, the matched score method uses the highest RIASEC score from the profile of the work tasks to select the corresponding RIASEC interest of the person and correlates the RIASEC score with job satisfaction. For example, the work task: "teaching children math," may have elements of investigative interests in the task, but the activity teaching and subject of the task (children) are social in nature, a person's social interest score is used to predict job satisfaction. This method of examining congruence has an advantage in that it potentially reduces coding errors from trying to interpret an activity using the RIASEC framework when there is insufficient detail provided. In this instance the HLM equation can be denoted with an individual's matched score with a random slope and intercept:

Level 1: $\text{Satisfaction}_{ti} = \beta_{0i} + \beta_{1i}\,\text{Matched\_score} + r_{ti}$ (18)

Level 2:

Intercept: $\beta_{0i} = \gamma_{00} + u_{0i}$ (19)

Within-person Matched_score: $\beta_{1i} = \gamma_{10} + u_{1i}$ (20)

Combined equation: $\text{Satisfaction}_{ti} = \gamma_{00} + \gamma_{10}\,(\text{Daily RP} - \overline{\text{Daily RP}}_i) + u_{0i} + r_{ti}$ (21)

Results

Variance decomposition of vocational interests

The results from the three variance decomposition methods are summarized in Table 12. In line with Study 1 (See Table 1) and Study 2 (See Table 7), the variance decomposition results indicate that there was more between-person than within-person variability. Note, that this may be because vocational interests were only measured in the morning, i.e., 1 time point a day. In contrast, with Studies 1 and 2 vocational interests were measured three times a day. Perhaps, unsurprising, variance decomposition utilizing all three time points resulted in more within-person variability. This suggests that there is additional intra-day variability in vocational interests (and personality in Study 2) that is not being accounted for when aggregating to the day level. The variance decomposition results from Study 3 further reinforce previous findings that vocational interest does indeed vary even between short intervals of time.

G-theory methods applied to the data from Study 3 yielded greater person by item variability (See Table 13). Combined with the results from Study 2, this suggests that when the same items are administered at every time point, it is not item by time variance is that added to the responses, but rather the person's idiosyncratic responses to specific items that is captured.

Correlation between global and person-mean RIASEC scores.

From Table 14, the overall correlation between interest global and interest person RIASEC scores were moderately to strongly correlated (r_{Social} = .42 to $r_{Enterprising}$ = .74), supporting hypothesis 1a. These results are generally in line with Study 1 and 2.

Circular Unidimensional Scaling

Because the full set of RIASEC domains were measured, I also ran CUS analyses on the person-mean RIASEC scores. The results from CUS structural analyses showed good fit to the expected quasi-circumplex (R^2 = .68, R^2_{SD} = .08). These structural results are similar to the CUS results from Study 1, suggesting that whole trait methods yield adequate representations of Holland's RIASEC model. Submitting global RIASEC scores (baseline scores) to CUS yielded excellent fit to a quasi-circumplex (R^2 = .92).

Stability of person-mean interest scores

As shown in Table 5, correlations between person-mean RIASEC scores from the 1st half of the Study with a duration of 5 days were strongly correlated with the person-mean interest scores from the 2nd half. These results support 1c and are consistent with results from Study 1 and 2. The central tendency scores obtained from experience sampling of vocational interests yields a high level of between-person stability.

Prediction of Job satisfaction

HLM results from the traditional approach of using an index of congruence (profile correlations) found no relationship between daily activity-congruence and daily job satisfaction

(Model 1, γ_{10} = -.23, p = .45, ns). These results held regardless of whether autonomy, day of week, or affect was controlled for and provide evidence against hypothesis 3[1].

The second HLM approach conceptualizes congruence as an interaction between the vocational interest of the person and daily work activity. This interaction approach runs a separate model for each RIASEC domain (see Table 16). The results revealed no statistically significant prediction between interaction term and job satisfaction for any RIASEC models or indeed any of the estimates run (beyond the intercept). These results held regardless of whether autonomy (see Table 17), day of the week (see Table 18), or affect was controlled for (see Table 19)[1].

The third matched score approach conceptualizes activity congruence as the highest coded RIASEC work task as a reference as to which of a person's corresponding RIASEC interest is best suited for predicting job satisfaction. The prediction between matched scores and job satisfaction were not statistically significant. These results held regardless of whether autonomy, day of the week or affect was controlled for (see Table 20).

Overall, the HLM results for all three operationalizations of congruence predicting job satisfaction did not find support for hypothesis 3. I did note that for most models tested daily

[1] In addition, I also ran model comparison tests between the base models with no controls, and models with the control variables for both traditional congruence approach models and the new interaction-based models. Results revealed that the models including the control variables of autonomy and day of the week were no better than the base models. With the exception of the models that included positive and negative affective models. See Appendix D, Tables D1 and D2.

positive affect and negative affect significantly predicted job satisfaction, in line with previous ESM studies examining the link between affect and job satisfaction (Fisher, 2000).

Supplementary analyses

Three supplementary analyses were conducted for Study 3: (1) the variance decomposition of the general factor of interests, (2) the variance decomposition of affect, and (3) investigating whether day of the week is an explanatory variable of the social interest variability over time.

As with previous studies, the variance of the general factor of interest was decomposed using the three methods, results from Study 3 are comparable to results from Study 1 and 2 that were aggregated at day level (as opposed to using all time points). Results from the variance decomposition of the general interest factor are provided in Table 12. Generally, there was more between-person variability than within-person variability. Of note, using G-theory methods allowed the separation of variability in the dataset that can be attributed to the inclusion of heterogenous items from different RIASEC scales (Item $\sigma = 3.34\%$).

Commonly, affect is included in whole trait theories of trait as a benchmark to compare the variability of the trait with another construct that is expected to be fairly context dependent (i.e., affect / emotions). In the case of this dissertation, I have not done so for reasons similar to those provided for Study 2 and personality factor: no measurement equivalence between constructs is established. This rationale for not comparing the variability of interests and affect is especially pertinent given that affect is measured on a unipolar scale. In contrast, vocational interests are measured on a bipolar scale—and as such the variances of scores obtain should not be directly compared (cf. Cacioppo & Berntson, 1994). Interpretative caution not to compare the variability between interest and affect is advised. Nevertheless, since previous ESM based

research has also examined the variability of affect, I have included the variance decomposition of daily affect from Study 3. From Table 12, there is generally more between person variability for negative affect than for positive affect; conversely there is seems to be slightly more within-person variability in positive affect than for negative affect. Overall, these results are consistent with previous whole trait studies that measure affect (e.g., Fleeson, 2001).

Finally, I examined whether day of the week was an explanatory variable for the variability of social interests. As with previous studies, I used effects coding to code the days of the week as categorical variables with Wednesday as the base. From Table 21, no days of the week were found to significantly predict social interests. These results differ from results reported in Study 1 that Fridays positively predicted social interests and Study 2 that Mondays negatively predicted social interests.

The use of employed working adults may explain the lack of day of the week effects. Student samples may schedule their social engagements to begin on Fridays (potentially starting their social plans early Friday); in contrast, working employees may be more constrained by their work schedules and are only able to schedule their social engagements on the weekends (Saturday and Sunday)—days that were not measured in Study 3. Previous research shows increases in social contexts for working adults for weekend days, but less so for other weekdays (Helliwell & Wang, 2014). Underlying the rationale provided as to why the results from different studies differ is the notion that state-like social interests increase when the environment provides the opportunity for social engagements.

Discussion

The purpose of Study 3 was two-fold, firstly to replicate the findings from Study 1 and 2 regarding hypotheses 1a to 1c and research question 1 in an employee sample. Overall the results

from Study 3 support the hypotheses. Scores that are derived from the central tendency of a density distribution (person-mean scores) are moderately to strongly correlated with scores typically obtained from vocational interest inventories (global scores). When people respond to interest items the responses are, in part, derived from an aggregation processes that the individual infers from previous vocational interest states.

Second, operationalizing a person's vocational interest trait as the average of his/her momentary vocational interests over time exhibits the expected interrelationships between RIASEC factors. The retention of the structural expectations of Holland's (1997) model suggests that the whole trait framework is an appropriate means of capturing a person's interests.

Finally, the relationship between the 1st half and the 2nd half of the ESM study duration were strongly correlated. These results provide further evidence that even though when measuring vocational interest using an ESM methodology and Whole Trait Theory framework the expected between-person stability of vocational interests is retained (Low et al., 2005). The high stabilities observed can be partly attributed to the short duration between time points.

Variance decomposition when scores were at the day level indicated that there is generally more between-person variability than within-person variability. The within-person variability of vocational interest is surprisingly large with up to 16% (investigative) of the total variability attributable to within-person fluctuations. This within-person variability may seem smaller compared to other studies, but I note that in contrast to Study 1 (42 survey administrations) and Study 2 (30 survey administrations), surveys in Study 3 were only measured in the morning (10 administrations). Thus, applying to variance decomposition to more time points was not possible in Study 3. Comparing the results of Study 3 with day-level aggregation yields more consistent results.

The second purpose of Study 3 is to examine the feasibility of an alternate operationalization of the congruence—activity congruence. I conceptualized congruence as a within-person phenomena predicting job satisfaction. Three methods of activity congruence were tested: the more commonly used operationalization of congruence as a profile correlation and congruence as an interaction between a person's interest and the corresponding interest level of their environment as well as a matched score. Results from all methods showed activity congruence did not predict job satisfaction. These results held regardless of whether the control variables were included the models tested.

It is possible that the lack of results might be due to how activities were captured. Work activities reported by participants generally do not provide details that conform to RIASEC relevant information that allow the coding of all RIASEC factors. Coders may have to superimpose their understanding of the RIASEC to provide a full interest profile for the work activity. Another possible reason for lack of expected results is the methodology of how satisfaction was measured. Given that experimental studies investigated the satisfaction in the task itself, the end of the day measurement of satisfaction may have been too temporally separated from the actual task performed (Korman, 1968; Leonard & Weitz, 1971; Locke, 1966, 1967). I note that the temporal distance between mid-day task and end of day satisfaction represents a trade-off between the causal inference that can be made by temporally separating time 2 and 3 in the study design and measuring both task and satisfaction at time 2. Measuring both work task and satisfaction in the middle of the day would introduce common method biases that would inflate the potential relationship between activity-congruence fit and satisfaction. I suggest that future research model satisfaction at both mid-day and at the end of the day.

Overall, the support of hypotheses 1a to 1c and results from variance decomposition suggests that applying Whole Trait Theory to vocational interests is an appropriate approach to capturing a person's interest that does not detract from what is known previously from previous vocational interest research. The propriety of Whole Trait Theory opens more avenues to exploring how vocational interests can vary as a state and more importantly, allows the investigation into the explanatory variables and conditions that interests are likely to be influenced and/or activated. And although activity congruence did not predict job satisfaction, it is possible that other methods of assessing activity congruence and methods of eliciting work activities will yield more promising results.

GENERAL DISCUSSION

The overarching goal of this dissertation was to examine the appropriateness of applying Whole Trait Theory to vocational interests. Results from three experience sampling studies provide support for the appropriateness of Whole Traits Theory (Fleeson & Jayawickreme, 2015). Overall, results across the three studies support the first and most fundamental assertation of Whole Trait Theory: vocational interests can be described as density distributions (with a variance and centrality parameter). First, variance decomposition methods partitioned the variability of interests into within-person, between-person, and total variability. Overall, all three studies found that there was a considerable amount of within-person variability of interests. Indeed, the amount of within-person variability is often times similar to the amount of between-person variability. This shows individual's vocational interests do fluctuate daily. This is of note, because these results are counter to the idea that vocational interests are stable traits across time and situations. Rather, the findings indicate that interests may be subjected to environmental and situational opportunities that can act as triggers to potentially shift or activate interests (Hidi & Renninger, 2006; Tett & Guterman, 2000).

Second, if a person's trait can be described as the centrality parameter of their density distribution, then the central tendency (mean) score of a person over time should also be moderate to strongly correlated with the person's score when they are describing their global level of vocational interests. Across all studies, peoples' mean scores from the ESM study duration, generally exhibited strong correlations with their score from their results to the more typical assessment of interests, i.e., their global scores. These results provide insight into the response processes that is undertaken by individual when asked to estimate their trait-level vocational interests. In particular, the finding that the internal standard that a person references

when responding to a survey content is an inference of how they have typically felt about an interest domain—answering previous calls by researchers for insight into these response processes (Silvia, 2006; Tourangeau et al., 2000).

Thirdly, stability (all studies) and structural results (Studies 1 and 3) of between-person vocational interest scores replicate prior research. A person's vocational interests operationalized as the mean interest scores across time exhibits high stability and the quasi-circumplex expected at the between-person level of analyses (Armstrong et al., 2003; Holland, 1997; Low et al., 2005). Whole Trait Theory accordingly expands the possible horizons of vocational interest research. Explanatory variables as to why do people's interests vary over the course of the day can now be investigated. Day of the week was examined as a possibility in explaining the variability of social interests; however, given the inconsistency in results across studies caution is advised regarding the robustness of these findings. These inconsistencies in results are perhaps not surprisingly since day of the week only serves as a proxy for the social activity opportunities and environments (Stone et al., 2012).

Fourth, results from Study 2 regarding the between-person level (i.e., person-mean scores) interests and personality traits indicate that the expected relationships between the two different trait constructs are maintained. Overall, the observed relationship between enterprising, social, and artistic interests with extraversion and openness personality factors were in the same direction and general magnitude when compared with previous meta-analytic estimates (Larson et al., 2002; Mount et al., 2005). This along with the previous stability and structural results suggest that the different operationalization of interests does not substantially change the substantive between-person relationships of vocational interests.

Finally, a different conceptualization of interest congruence at the within-person level was tested: activity congruence. Results did not support the hypotheses that activity congruence predicted job satisfaction regardless of whether autonomy, day of the week, and affect were controlled. It may be the case that the way activity-congruence was operationalized was not appropriate for examining this relationship. Indeed, a myriad of different congruence indices have been developed for interests (Brown & Gore, 1994; Camp & Chartrand, 1992) with yet more new methods being employed such as polynomial regression (Nye, Prasad, Bradburn, & Elizondo, 2018). Polynomial regression (or even the reduced form including only main effects and interaction terms) as a method has a notable number of benefits. However, it is of note that the estimation of all RIASEC factors simultaneously including higher order terms greatly increases the number of parameters that need to be estimated—this is especially the case of the random effects HLM model used in the current study. Consequently, the application of polynomial regression or the estimation of model which include all 6 RIASEC factors simultaneously would require a large number of observations (over $n = 2000$) beyond the number of observations collected in this dissertation. Nevertheless, there is considerable merit in these techniques, future studies should recruit much larger sample sizes not just based on expected effect size but also parameter estimation.

It is possible that the three methods examined in Study 3 were not appropriate for assessing this relationship. Furthermore, although respondents provided information regarding their task activities, it does not imply that RIASEC aspects of these activities can be readily inferred by coders. In the case of Study 3, the RIASEC model had to be superimposed on the work task description provided—possibly resulting in an inaccurate coding of the nature of the activity that was engaged. Future research may instead consider running the same research

design but on a homogenous occupation sample (e.g., teachers) with a predefined activity list: both to reduce coding error and reducing respondent fatigue.

Limitations, implications, and future directions

Limitations. Three limitations across the set of three studies include the reliance on self-report and the measurement of interests. All studies relied on self-report measurement of interests and accordingly common method biases may be present (Podsakoff et al., 2003). Although some of the problems regarding common method bias (i.e., single cross-sectional designs) are ameliorated by the intensive longitudinal design, the studies are still subject to rating biases and corresponding problems, e.g., transient mood states. Given the moderate correlation between the discrete emotion *interest* with other positive affect, the variability observed of interest states may, in part, be driven by the other momentary affect rather than actual the environmental and situational context (Watson & Tellegen, 1985). Accordingly, it may be difficult to control for momentary affect given that interest is also an emotion and that it covaries moderately with another positive affect (Zevon & Tellegen, 1982). Nevertheless, future studies assessing the within-person level vocational interest can seek to control for discrete emotions that may also emerge as the emotional appraisal process (Frijda, 1993). To overcome the problem of single source rating, future studies may also seek to assess the variability of a person's interest by using other-ratings of interest. Although not many studies have examined self-other ratings of vocational interests, those that have generally find the two sources of rating to converge on similar assessments of trait interests (Holtrop, Born, & de Vries, 2018; Nauta, 2012). Given that short temporal gaps and opportunities to observe the displays of interest, such studies may be more meaningfully conducted with a developmental focus in mind, e.g.,

teachers/parents rating students/children, investigating how class or family environment can shift trait levels of different interests or differentiate between different types of interest.

The way interests are measured may also be a limitation in these studies. Consider the realistic item: "*fix* a *broken faucet*." Vocational interest measurement often requires both an action (verb) and object (noun) as was employed in the three studies. This problematic since the goal of Whole Trait Theory is to measure how different context in every day experiences, inclusion of the object in interest measurement constrains the context in which the action occurs—potentially reducing the variability in responses that may attributed to the situation. Thus, estimates of within-person variability across the three studies may be an under estimate of the true variability of vocational interest states. This constrain of measuring traits with items that include contexts is potentially why Whole Trait Theory studies in personality rely on adjective based measures to assess how much the situation has influenced the individual to act in a certain way (e.g., whether they have been *talkative* during the period of measurement). Unfortunately, although interest like personality is based on adjectives, few equivalent adjective based measures of interests have been developed.

Finally, the data analyzed across the three studies were treated as continuous (interval) and normal. However, this can be problematic as the Likert items used across these studies are in essence ordinal variables, because the differences between each point of the scale are likely to be relative (Clogg & Shihadeh, 1994). This could be problematic since a normal distribution is assumed in subsequent analyses and when ordinal measurement is used with that assumption as opposed to interval scales, there can be a loss of power due to scale coarseness (Krieg, 1999; Russell, Pinto, & Bobko, 1991). Germane to the studies of this dissertation, the use of ordinal scales may lead to biased estimates of covariances and variances (Bollen & Barb, 1981). It

should be noted that this problem of treating ordinal scales as interval is not unique to this dissertation but rather widespread in psychological research. I note that solutions exist to rescale ordinal to interval using methods such as item response theory (Harwell & Gatti, 2001; Maxwell & Delaney, 1985). This method would overcome the problems associated with ordinal scales but the sheer number of participants and items that may be required for reasonable parameter estimates in item response theory goes far beyond the economies of the samples in not just the present studies but most whole trait studies. Nevertheless, one potential avenue to explore is to apply such rescale methods to a much larger ESM dataset examining the differences between unscaled and rescaled variance estimates.

Implications and future directions. The fact that there is almost as much within-person as there is between-person variability provides impetus to explore and reconcile different areas of interest research in theory and research. That interest has been discussed as an momentary discrete emotion (Silvia, 2008), situational interest (Ainley, 2006), and trait-like vocational interests (Rounds & Su, 2014). These results provide an initial link between the situational and trait-like vocational; dependent on the day to day situations a person experiences, certain relevant vocational interest traits are invoked as states as observed in the variability captured by ESM. What is needed is for future studies to examine the contexts that activate these interests and, moreover, these activations of vocational interest traits by situations are expected to *crystallize* into trait-level shifts in interests (see Wrzus & Roberts, 2017). For example, recent meta-analytic results suggest mean-shifts in interests increases with age, potentially due to life-experiences. ESM studies with longer time frames may be able capture this change during transitional periods of adult development (Hoff, Briley, Wee, & Rounds, 2018).

This study also employed three different methods of variance decomposition and, regardless of method used, results showed that there was a considerable amount of within-person variability. Differences between the methods began to emerge when disaggregating from the day level to using all time points sampled. Generally, the more commonly used density distribution and HLM method tended to overestimate the amount of within-person variability. This may occur in part because both these methods do not accurately represent within-person variability either by not estimating error (density distribution) or by combining within-person variability with the error estimated (HLM). G-theory methods used in these studies overcome both these limitations and provide a more reasonable estimate of within-person variability because it parses out other extraneous sources of variability (e.g., person by item variance). The ability for G-theory to parse different sources of variance possesses considerable utility in accommodating different design choices undertaken by the researcher. These two considerable advantages set up G-theory as an ideal method to use in variance decomposition of other traits (e.g., values). However, one considerable limitation of G-theory is the need for a complete set of observations and whilst methods such as multiple-imputation can readily be used to address this, multiple imputation is computationally intensive as are the procedures used to combine results from imputed datasets (Enders, 2010). HLM can serve to ameliorate these methods because it can employ maximum likelihood methods for data and because G-theory is based on ANOVA—a special case of regression—together suggesting that a G-theory approach via HLM is possible and beneficial. To date, there has been no comparable G-theory adaptation within a HLM framework, although I note that psycholinguistic research has an HLM alternative to item analysis that is essentially a two-factor G-theory (Locker, Hoffman, & Bovaird, 2007). Future

research can work to expand this HLM alternative to accommodate the full three-factor solution found in classical G-theory (Cronbach et al., 1963).

Conclusion

Overall, results of three studies show Whole Trait Theory is a viable and appropriate approach to examine the vocational interests. Of note, the amount of within-person variability estimated suggests that person's vocational interest traits can be described at the central tendency of the different vocational interest states they experience over time. These results expand the research possibility for both theory integration as well as examining how interests function at the daily level.

TABLES

Table 1

Study 1 within- and between-person estimate for three partitioning techniques with full set of time points

	Density distribution	**HLM**		**G-theory**	
Realistic	Variance	Variance	%	Variance	%
Within-person Variability	0.37	0.37	64.07	0.23	22.36
Between-person Variability	0.22	0.21	35.93	0.21	20.94
Total Variability	0.58	0.57	100.00	1.01	99.98
Investigative					
Within-person Variability	0.48	0.48	57.44	0.32	19.20
Between-person Variability	0.38	0.36	45.87	0.36	21.96
Total Variability	0.84	0.84	103.31	1.66	100.04
Artistic					
Within-person Variability	0.50	0.50	45.87	0.36	23.16
Between-person Variability	0.44	0.42	54.13	0.43	27.34
Total Variability	0.91	0.91	100.00	1.56	100.02
Social					
Within-person Variability	0.50	0.50	56.26	0.34	21.44
Between-person Variability	0.41	0.39	43.74	0.40	24.84
Total Variability	0.89	0.89	100.00	1.60	100.02
Enterprising					
Within-person Variability	0.39	0.39	56.26	0.24	17.16
Between-person Variability	0.31	0.30	43.74	0.31	22.00
Total Variability	0.69	0.69	100.00	1.39	99.96
Conventional					
Within-person Variability	0.38	0.38	42.91	0.27	25.94
Between-person Variability	0.30	0.29	57.09	0.29	28.04
Total Variability	0.67	0.67	100.00	1.05	99.98
General interest factor					
Within-person Variability	0.15	0.15	49.84	0.12	7.58
Between-person Variability	0.16	0.15	50.16	0.15	9.60
Total Variability	0.31	0.31	100.00	1.58	99.98

Note. $N = 60$, Total observations over time = 2520.

Table 2

Study 1 within- and between-person estimate for three partitioning techniques

	Density distribution	**HLM**		**G-theory**	
Realistic	Variance	Variance	%	Variance	%
Within-person Variability	0.15	0.15	42.49	0.23	22.36
Between-person Variability	0.22	0.20	57.51	0.21	20.94
Total Variability	0.36	0.36	100.00	1.01	100.00
Investigative					
Within-person Variability	0.19	0.19	34.94	0.32	19.20
Between-person Variability	0.38	0.36	65.06	0.36	21.96
Total Variability	0.84	0.55	100.00	1.66	100.00
Artistic					
Within-person Variability	0.18	0.18	30.06	0.36	23.16
Between-person Variability	0.44	0.42	69.94	0.43	27.34
Total Variability	0.91	0.60	100.00	1.56	100.00
Social					
Within-person Variability	0.20	0.20	33.81	0.34	21.44
Between-person Variability	0.41	0.39	66.19	0.40	24.84
Total Variability	0.89	0.58	100.00	1.60	100.00
Enterprising					
Within-person Variability	0.15	0.15	34.09	0.24	17.16
Between-person Variability	0.31	0.30	65.91	0.31	22.00
Total Variability	0.69	0.45	100.00	1.39	100.00
Conventional					
Within-person Variability	0.16	0.16	36.31	0.27	25.94
Between-person Variability	0.30	0.28	63.69	0.29	28.04
Total Variability	0.67	0.45	100.00	1.05	100.00
General interest factor					
Within-person Variability	0.07	0.07	31.28	0.12	7.58
Between-person Variability	0.16	0.15	68.72	0.15	9.60
Total Variability	0.31	0.22	100.00	1.58	100.00

Note. $N = 60$, total observations over time = 840, G-theory analyses based on 2520 observations.

Table 3

G-theory Study 1 results

	Realistic		Investigative		Artistic		Social		Enterprising		Conventional		General interest	
	Var	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**
P	0.21	20.94	0.36	21.96	0.43	27.34	0.40	24.84	0.31	22.00	0.29	28.04	0.15	9.60
T	0.06	5.50	0.00	0.16	0.01	0.32	0.01	0.84	0.01	0.82	0.04	3.58	0.01	0.48
I	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.01	0.80	0.00	0.02	0.20	12.84
P × T	0.23	22.36	0.32	19.20	0.36	23.16	0.34	21.44	0.24	17.16	0.27	25.94	0.12	7.58
P × I	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.26	0.00	0.06	0.18	11.52
I × T	0.02	1.94	0.06	3.46	0.02	1.24	0.03	1.58	0.08	5.72	0.01	0.82	0.05	3.04
P × I × T + e	0.50	49.24	0.92	55.22	0.75	47.96	0.82	51.30	0.74	53.20	0.43	41.52	0.87	54.92

Note. $N = 60$, Total observations over time = 2520.

Table 4

Study 1 Correlation between interest central tendency estimates

	Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1	Global Realistic	1.68	.80	(.96)											
2	Global Investigative	2.57	1.36	.45	(.94)										
3	Global Artistic	2.60	1.22	.56	.34	(.97)									
4	Global Social	3.16	1.11	.38	.41	.48	(.94)								
5	Global Enterprising	2.55	.66	.64	.21	.62	.24	(.95)							
6	Global Conventional	2.08	.97	.75	.29	.47	.31	.69	(.97)						
7	Person-level Realistic	1.99	.47	**.64**	.15	.20	.04	.64	.44	(.96)					
8	Person-level Investigative	2.89	.47	.36	**.59**	.28	.18	.41	.22	.39	(.97)				
9	Person-level Artistic	2.86	.53	.40	.25	**.68**	.31	.62	.32	.38	.43	(.97)			
10	Person-level Social	3.29	.57	.11	.07	.28	**.62**	.32	.12	.03	.14	.41	(.97)		
11	Person-level Enterprising	2.43	.59	.40	.09	.31	.10	**.85**	.49	.63	.34	.53	.32	(.96)	
12	Person-level Conventional	2.21	.62	.48	.03	.09	-.01	.61	**.67**	.67	.26	.29	.08	.75	(.97)

Note. $N = 60$, Correlations above .26 are significant at the .05 level. Stability estimates highlighted in bold.

Table 5

Summary of stability results across 3 Studies

	Study 1	**Study 2**	**Study 3**
Realistic	.89		.81
Investigative	.86		.76
Artistic	.91	.87	.83
Social	.88	.82	.87
Enterprising	.90	.85	.87
Conventional	.90		.84
General interest	.88	.83	.83
Extraversion		.70	
Openness		.73	
General plasticity		.69	
Positive affect			.84
Negative affect			.93

Note. $N_{Study1} = 60$, $N_{Study2} = 49$, $N_{Study3} = 55$.

Table 6

Study 1 Results of time of day and day of the week predicting social interests.

	Terms	**Estimate**	***SE***	***p***
Model: Social				
Intercept	*γ00*	2.64	.07	< .001
Monday	*γ10*	-.03	.03	.22
Tuesday	*γ20*	-.01	.03	.49
Thursday	*γ30*	.05	.03	.17
Friday	*γ30*	.08	.03	.02
Saturday	*γ40*	-.04	.03	.18
Sunday	*γ50*	.01	.03	.43
Afternoon	*γ60*	-.03	.03	.31
Evening	*γ70*	.02	.03	.49

Table 7

Study 2 within- and between-person estimate for three partitioning techniques with full set of time points

	Density distribution	HLM		G-theory	
	Variance	Variance	%	Variance	%
Enterprising					
Within-person Variability	0.34	0.34	62.45	0.23	17.2
Between-person Variability	0.22	0.20	37.55	0.16	12.18
Total Variability	0.54	0.54	100.00	1.35	100
Social					
Within-person Variability	0.37	0.37	62.48	0.27	19.10
Between-person Variability	0.24	0.22	37.52	0.20	13.68
Total Variability	0.59	0.59	100.00	1.43	100
Artistic					
Within-person Variability	0.42	0.42	55.27	0.33	19.34
Between-person Variability	0.37	0.34	44.73	0.32	18.36
Total Variability	0.77	0.76	100.00	1.73	100
Extraversion					
Within-person Variability	1.10	1.10	81.61	0.84	29.94
Between-person Variability	0.29	0.25	18.39	0.21	7.36
Total Variability	1.34	1.35	100.00	2.82	100
Openness					
Within-person Variability	0.61	0.61	74.87	0.37	15.18
Between-person Variability	0.23	0.21	25.13	0.16	6.54
Total Variability	0.82	0.82	100.00	2.42	100
General interest factor					
Within-person Variability	0.20	0.20	62.33	0.16	10.12
Between-person Variability	0.13	0.12	37.67	0.10	6.66
Total Variability	0.31	0.32	100.00	1.55	100
General plasticity factor					
Within-person Variability	0.59	0.59	80.81	0.45	16.86
Between-person Variability	0.16	0.14	19.19	0.11	4.26
Total Variability	0.73	0.73	100.00	2.67	100

Note. N = 49, Total observations over time = 490, G-theory analyses based on 1470 observations.

Table 8

Study 2 within- and between-person estimate for three partitioning techniques

	Density distribution	HLM		G-theory	
	Variance	Variance	%	Variance	%
Enterprising					
Within-person Variability	0.34	0.34	62.45	0.23	17.2
Between-person Variability	0.22	0.20	37.55	0.16	12.18
Total Variability	0.54	0.54	100.00	1.35	100
Social					
Within-person Variability	0.37	0.37	62.48	0.27	19.10
Between-person Variability	0.24	0.22	37.52	0.20	13.68
Total Variability	0.59	0.59	100.00	1.43	100
Artistic					
Within-person Variability	0.42	0.42	55.27	0.33	19.34
Between-person Variability	0.37	0.34	44.73	0.32	18.36
Total Variability	0.77	0.76	100.00	1.73	100
Extraversion					
Within-person Variability	1.10	1.10	81.61	0.84	29.94
Between-person Variability	0.29	0.25	18.39	0.21	7.36
Total Variability	1.34	1.35	100.00	2.82	100
Openness					
Within-person Variability	0.61	0.61	74.87	0.37	15.18
Between-person Variability	0.23	0.21	25.13	0.16	6.54
Total Variability	0.82	0.82	100.00	2.42	100
General interest factor					
Within-person Variability	0.20	0.20	62.33	0.16	10.12
Between-person Variability	0.13	0.12	37.67	0.10	6.66
Total Variability	0.31	0.32	100.00	1.55	100
General plasticity factor					
Within-person Variability	0.59	0.59	80.81	0.45	16.86
Between-person Variability	0.16	0.14	19.19	0.11	4.26
Total Variability	0.73	0.73	100.00	2.67	100

Note. N = 49, Total observations over time = 1470.

Table 9

G-theory Study 2 results

	Extraversion		Openness		Artistic		Social		Enterprising		General interest		Plasticity	
	Var	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**
P	0.21	7.36	0.16	6.54	0.32	18.36	0.20	13.68	0.16	12.18	0.10	6.66	0.11	4.26
T	0.00	0.18	0.01	0.24	0.00	0.00	0.01	0.92	0.00	0.08	0.00	0.14	0.01	0.22
I	0.00	0.12	0.13	5.58	0.09	5.40	0.03	2.44	0.06	4.68	0.10	6.36	0.12	4.64
P × T	0.84	29.94	0.37	15.18	0.33	19.34	0.27	19.10	0.23	17.20	0.16	10.12	0.45	16.86
P × I	0.27	9.74	0.31	12.92	0.28	16.38	0.25	17.44	0.26	19.24	0.39	25.26	0.36	13.54
I × T	0.00	0.02	0.00	0.08	0.00	0.12	0.00	0.00	0.00	0.02	0.00	0.20	0.00	0.04
P × I × T + e	1.48	52.64	1.44	59.50	0.70	40.36	0.66	46.44	0.63	46.56	0.80	51.30	1.62	60.42

Note. $N = 49$, Total observations over time = 1470.

Table 10

Study 2 Correlation between interest and personality estimates.

	Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1	Global Enterprising	2.71	.72	(.70)									
2	Global Social	3.42	.83	.29	(.84)								
3	Global Artistic	3.18	.95	.46	.08	(.87)							
4	Global Extraversion	4.73	1.02	.12	.23	-.10	(.71)						
5	Global Openness	5.01	1.06	.07	-.12	.14	.45	(.83)					
6	Person-level Enterprising	3.36	.47	**.51**	.00	.14	.17	.05	(.71)				
7	Person-level Social	2.85	.49	.34	**.70**	.07	.04	-.16	.27	(.80)			
8	Person-level Artistic	2.98	.60	.34	.10	**.72**	-.05	.11	.17	.11	(.84)		
9	Person-level Extraversion	3.24	.48	.25	.24	.24	**.29**	.04	<u>.58</u>	<u>.31</u>	<u>.33</u>	(.71)	
10	Person-level Openness	3.65	.52	.18	-.04	.37	-.30	**.13**	<u>.16</u>	<u>.14</u>	<u>.39</u>	.25	(.62)

Note. N = 49 Correlations above .28 are significant at the .05 level. Stability estimates highlighted in bold. Hypothesized nomological relationships underlined.

Table 11

Study 2 Results of time of day and day of the week predicting social interests.

	Terms	Estimate	*SE*	*p*
Model: Social				
Intercept	γ_{00}	2.87	.07	< .001
Monday	γ_{10}	-.12	.03	< .001
Tuesday	γ_{20}	-.04	.03	.24
Thursday	γ_{30}	.00	.05	.70
Friday	γ_{30}	.03	.05	.57
Saturday	γ_{40}	.03	.05	.43
Sunday	γ_{50}	.08	.05	.16
Afternoon	γ_{60}	-.02	.02	.40
Evening	γ_{70}	.03	.02	.24

Note. $N_{level1} = 49$, $N_{level2} = 490$.

Table 12

Study 3 within- and between-person estimate for three partitioning techniques

	Density distribution	HLM		G-theory	
Realistic		Variance	%	Variance	%
Within-person Variability	0.28	0.28	37.45	0.19	15.28
Between-person Variability	0.51	0.47	62.55	0.45	35.32
Total Variability	0.75	0.75	100.00	1.26	100
Investigative					
Within-person Variability	0.29	0.29	45.27	0.19	16.50
Between-person Variability	0.39	0.35	54.73	0.34	29.14
Total Variability	0.65	0.65	100.00	1.16	100
Artistic					
Within-person Variability	0.27	0.27	49.10	0.17	15.22
Between-person Variability	0.32	0.28	50.90	0.25	21.98
Total Variability	0.56	0.56	100.00	1.13	100
Social					
Within-person Variability	0.25	0.25	44.65	0.16	13.58
Between-person Variability	0.34	0.31	55.35	0.28	24.30
Total Variability	0.79	0.56	100.00	1.14	100
Enterprising					
Within-person Variability	0.27	0.27	34.62	0.16	11.06
Between-person Variability	0.56	0.52	65.38	0.48	32.50
Total Variability	0.79	0.79	100.00	1.47	100
Conventional					
Within-person Variability	0.31	0.31	37.34	0.21	15.92
Between-person Variability	0.56	0.52	62.66	0.50	36.88
Total Variability	0.82	0.82	100.00	1.34	100
Global interest factor					
Within-person Variability	0.14	0.14	38.44	0.12	9.72
Between-person Variability	0.25	0.23	61.56	0.22	17.38
Total Variability	0.37	0.37	100.00	1.28	100
Positive affect					
Within-person Variability	0.34	0.34	41.99	0.22	16.30
Between-person Variability	0.51	0.47	58.01	0.46	33.70
Total Variability	0.80	0.80	100.00	1.36	100
Negative affect					
Within-person Variability	0.30	0.30	23.04	0.22	13.76
Between-person Variability	1.04	0.99	76.96	1.00	61.84
Total Variability	1.29	1.29	100.00	1.62	100

Note. N = 55, Total observations over time = 550.

Table 13

G-theory Study 3 results

	Realistic		Investigative		Artistic		Social		Enterprising		Conventional		General interest		Positive Affect		Negative Affect	
	Var	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**	**Var**	**%**
P	0.45	35.32	0.34	29.14	0.25	21.98	0.28	24.30	0.48	32.50	0.50	36.88	0.22	17.38	0.46	33.70	1.00	61.84
T	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.04	0.00	0.04	0.00	0.02	0.00	0.16
I	0.01	0.90	0.00	0.00	0.00	0.02	0.03	2.68	0.02	1.68	0.02	1.24	0.04	3.34	0.01	0.66	0.00	0.10
P × T	0.19	15.28	0.19	16.50	0.17	15.22	0.16	13.58	0.16	11.06	0.21	15.92	0.12	9.72	0.22	16.30	0.22	13.76
P × I	0.17	13.08	0.12	10.60	0.20	17.52	0.19	16.96	0.28	18.98	0.15	11.26	0.34	26.76	0.09	6.50	0.03	2.14
I × T	0.00	0.08	0.00	0.04	0.00	0.24	0.00	0.30	0.00	0.24	0.00	0.06	0.00	0.06	0.00	0.32	0.00	0.02
P × I × T + e	0.45	35.36	0.50	43.58	0.51	45.00	0.48	42.14	0.52	35.44	0.47	34.62	0.55	42.70	0.58	42.52	0.36	21.98

Note. N = 55, Total observations over time = 550.

Table 14

Study 3 Correlation between interest, affectivity, and job satisfaction estimates

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Global Realistic	3.17	.99	(.82)																	
2 Global Investigative	3.35	.90	.58	(.73)																
3 Global Artistic	3.53	.90	.41	.73	(.64)															
4 Global Social	3.39	.89	.48	.62	.68	(.72)														
5 Global Enterprising	3.22	.89	.67	.55	.59	.65	(.70)													
6 Global Conventional	3.07	.98	.79	.57	.41	.59	.72	(.80)												
7 Global Positive affectivity	3.17	.91	.35	.18	.29	.40	.41	.32	(.81)											
8 Global Negative affectivity	2.55	1.03	.66	.32	.20	.30	.34	.46	.34	(.86)										
9 Global Satisfaction	1.80	.48	.20	.22	.35	.17	.28	.12	.23	.23	(.71)									
10 Person-level Realistic	2.96	.71	**.66**	.17	-.04	.13	.37	.56	.25	.61	.15	(.88)								
11 Person-level Investigative	3.28	.63	.45	**.58**	.19	.27	.31	.37	.29	.39	.18	.52	(.86)							
12 Person-level Artistic	3.44	.56	.27	.35	**.57**	.31	.35	.10	.15	.34	.28	.21	.26	(.79)						
13 Person-level Social	3.30	.58	.40	.28	.09	**.42**	.35	.40	.21	.46	.02	.54	.59	.39	(.80)					
14 Person-level Enterprising	3.11	.75	.57	.18	.11	.24	**.74**	.53	.33	.45	.19	.67	.39	.28	.54	(.85)				
15 Person-level Conventional	2.94	.75	.59	.11	-.10	.09	.37	**.65**	.26	.56	.01	.86	.45	.02	.52	.66	(.88)			
16 Person-level Positive affectivity	3.06	.71	.23	.25	.12	.31	.21	.25	**.50**	.33	.05	.32	.48	-.08	.24	.26	.30	(.90)		
17 Person-level Negative affectivity	2.35	1.02	.52	.22	.06	.17	.30	.44	.17	**.71**	.14	.63	.30	.07	.27	.44	.64	.58	(.96)	
18 Person-level Satisfaction	1.82	.29	-.28	-.07	.08	.03	-.17	-.20	-.14	-.40	**.22**	-.31	-.27	-.02	-.22	-.37	-.40	-.23	-.36	(.63)

Note. $N = 55$, Correlations above .27 are significant at the .05 level. Stability estimates highlighted in bold.

Table 15

Study 3 Results of congruence (traditional) predicting job satisfaction

	Term	Estimate	*SE*	*p*
Model 1				
Intercept	γ_{00}	1.65	.06	< .001
Within-person congruence	γ_{10}	-.19	.33	.47
Between-person congruence	γ_{01}	-.07	.05	.23
Model 2				
Intercept	γ_{00}	1.63	.17	< .001
Within-person congruence	γ_{10}	-.20	.34	.46
Between-person congruence	γ_{01}	-.07	.05	.19
Autonomy	γ_{20}	.00	.00	.71
Model 3				
Intercept	γ_{00}	1.66	.06	< .001
Within-person congruence	γ_{10}	-.19	.33	.47
Between-person congruence	γ_{01}	-.06	.05	.23
Day (Monday)	γ_{20}	.03	.05	.53
Day (Tuesday)	γ_{30}	-.01	.05	.68
Day (Thursday)	γ_{40}	-.04	.05	.38
Day (Friday)	γ_{50}	-.02	.05	.62
Model 4				
Intercept	γ_{00}	1.51	.18	< .001
Within-person congruence	γ_{10}	.04	.27	.79
Between-person congruence	γ_{01}	-.06	.05	.22
Positive affect	γ_{20}	.11	.05	.04
Negative affect	γ_{30}	-.10	.05	.05

Note. N_{level1} = 55, N_{level2} = 550.

Table 16

Study 3 Results of congruence (interaction) predicting job satisfaction

	Term	Estimate	*SE*	*p*
Model: Realistic				
Intercept	γ_{00}	1.41	.39	.00
$Realistic_{bp}$	γ_{01}	.10	.12	.44
$Realistic_{be}$	γ_{02}	-.04	.06	.47
$Realistic_{wp}$	γ_{10}	.03	.04	.46
$Realistic_{we}$	γ_{20}	.01	.03	.41
$Realistic_{wp*we}$	γ_{30}	.00	.01	.23
Model: Investigative				
Intercept	γ_{00}	1.48	.46	.01
$Investigative_{bp}$	γ_{01}	.04	.14	.71
$Investigative_{be}$	γ_{02}	.00	.07	.86
$Investigative_{wp}$	γ_{10}	-.03	.04	.51
$Investigative_{we}$	γ_{20}	.01	.03	.69
$Investigative_{wp*we}$	γ_{30}	.00	.01	.59
Model: Artistic				
Intercept	γ_{00}	1.44	.59	.03
$Artistic_{bp}$	γ_{01}	.02	.16	.76
$Artistic_{be}$	γ_{02}	.07	.10	.49
$Artistic_{wp}$	γ_{10}	-.02	.05	.56
$Artistic_{we}$	γ_{20}	.00	.03	.52
$Artistic_{wp*we}$	γ_{30}	.00	.01	.84
Model: Social				
Intercept	γ_{00}	1.85	.37	.00
$Social_{bp}$	γ_{01}	-.04	.11	.70
$Social_{be}$	γ_{02}	-.06	.10	.57
$Social_{wp}$	γ_{10}	-.04	.05	.43
$Social_{we}$	γ_{20}	.01	.03	.69
$Social_{wp*we}$	γ_{30}	.00	.01	.52
Model: Enterprising				
Intercept	γ_{00}	1.08	.44	.02
$Enterprising_{bp}$	γ_{01}	.14	.13	.30
$Enterprising_{be}$	γ_{02}	.04	.05	.44
$Enterprising_{wp}$	γ_{10}	-.01	.05	.75
$Enterprising_{we}$	γ_{20}	.00	.02	.50
$Enterprising_{wp*we}$	γ_{30}	.00	.01	.18
Model: Conventional				
Intercept	γ_{00}	.93	.46	.08
$Conventional_{bp}$	γ_{01}	.13	.12	.29
$Conventional_{be}$	γ_{02}	.08	.06	.24
$Conventional_{wp}$	γ_{10}	.01	.05	.62
$Conventional_{we}$	γ_{20}	-.02	.03	.39
$Conventional_{wp*we}$	γ_{30}	.00	.01	.63

Note. $N_{level1} = 55$, $N_{level2} = 550$. Analyses were conducted separately for each RIASEC domain. Subscripts: bp = between-person interest, be = between-person environment; wp = within-person interest, we =within-person environment.

Table 17

Study 3 Results of congruence (interaction) predicting job satisfaction with autonomy as control

	Term	Estimate	*SE*	*p*
Model: Realistic				
Intercept	*γ00*	1.27	.39	< .001
Realisticbp	*γ01*	.13	.12	.31
Realisticbe	*γ02*	-.05	.05	.40
Realisticwp	*γ10*	.04	.05	.40
Realisticwe	*γ20*	.00	.04	.55
Realisticwp$_{*we}$	*γ30*	.07	.07	.35
Autonomy	*γ40*	.00	.00	.81
Model: Investigative				
Intercept	*γ00*	1.30	.44	.01
Investigativebp	*γ01*	.09	.13	.56
Investigativebe	*γ02*	.00	.07	.78
Investigativewp	*γ10*	-.01	.05	.57
Investigativewe	*γ20*	.00	.03	.88
Investigativewp$_{*we}$	*γ30*	.03	.06	.62
Autonomy	*γ40*	.00	.00	.81
Model: Artistic				
Intercept	*γ00*	1.19	.61	.07
Artisticbp	*γ01*	.08	.16	.58
Artisticbe	*γ02*	.08	.09	.43
Artisticwp	*γ10*	.02	.05	.49
Artisticwe	*γ20*	-.01	.04	.58
Artisticwp$_{*we}$	*γ30*	-.09	.08	.12
Autonomy	*γ40*	.00	.00	.87
Model: Social				
Intercept	*γ00*	1.89	.38	< .001
Socialbp	*γ01*	.15	.08	.08
Socialbe	*γ02*	.02	.12	.88
Socialwp	*γ10*	-.10	.09	.29
Socialwe	*γ20*	-.05	.05	.34
Socialwp$_{*we}$	*γ30*	.03	.04	.46
Autonomy	*γ40*	.00	.00	.38
Model: Enterprising				
Intercept	*γ00*	.98	.44	.05
Enterprisingbp	*γ01*	.12	.13	.43
Enterprisingbe	*γ02*	.04	.05	.40
Enterprisingwp	*γ10*	.00	.05	.71
Enterprisingwe	*γ20*	.00	.03	.83
Enterprisingwp$_{*we}$	*γ30*	-.04	.05	.51
Autonomy	*γ40*	.00	.00	.30
Model: Conventional				
Intercept	*γ00*	.86	.47	.08
Conventionalbp	*γ01*	.15	.12	.24
Conventionalbe	*γ02*	.09	.06	.14
Conventionalwp	*γ10*	.03	.04	.53
Conventionalwe	*γ20*	-.03	.03	.36
Conventionalwp$_{*we}$	*γ30*	.00	.06	.60
Autonomy	*γ40*	.00	.00	.82

Note. Analyses were conducted seperately for each RIASEC domain. Subscripts: bp = between-person interest, be = between-person environment; wp = within-person interest, we =within-person environment.

Table 18

Study 3 Results of congruence (interaction) predicting job satisfaction with Day of the week as control

	Term	Estimate	*SE*	*p*
Model: Social				
Intercept	γ_{00}	1.84	.37	.00
$Social_{bp}$	γ_{01}	-.04	.11	.73
$Social_{be}$	γ_{02}	-.06	.10	.57
$Social_{wp}$	γ_{10}	-.05	.05	.40
$Social_{we}$	γ_{20}	.01	.03	.69
$Social_{wp*we}$	γ_{30}	.00	.01	.54
Day (Monday)	γ_{40}	.04	.04	.39
Day (Tuesday)	γ_{50}	.03	.04	.53
Day (Thursday)	γ_{60}	-.06	.04	.19
Day (Friday)	γ_{70}	-.01	.05	.58
Model: Enterprising				
Intercept	γ_{00}	1.07	.44	.03
$Enterprising_{bp}$	γ_{01}	.14	.13	.29
$Enterprising_{be}$	γ_{02}	.04	.05	.44
$Enterprising_{wp}$	γ_{10}	-.02	.05	.71
$Enterprising_{we}$	γ_{20}	.00	.02	.48
$Enterprising_{wp*we}$	γ_{30}	.00	.01	.21
Day (Monday)	γ_{40}	.04	.04	.39
Day (Tuesday)	γ_{50}	.03	.04	.56
Day (Thursday)	γ_{60}	-.06	.04	.21
Day (Friday)	γ_{70}	-.01	.05	.58
Model: Conventional				
Intercept	γ_{00}	1.00	.46	.06
$Conventional_{bp}$	γ_{01}	.13	.11	.28
$Conventional_{be}$	γ_{02}	.06	.07	.58
$Conventional_{wp}$	γ_{10}	.00	.05	.63
$Conventional_{we}$	γ_{20}	-.02	.03	.40
$Conventional_{wp*we}$	γ_{30}	.00	.01	.61
Day (Monday)	γ_{40}	.03	.04	.56
Day (Tuesday)	γ_{50}	.03	.04	.50
Day (Thursday)	γ_{60}	-.06	.04	.21
Day (Friday)	γ_{70}	-.01	.05	.54

Note. $N_{level1} = 55$, $N_{level2} = 550$. Analyses were conducted separately for each RIASEC domain. Subscripts: bp = between-person interest, be = between-person environment; wp = within-person interest, we =within-person environment.

Table 18 (cont'd)

Study 3 Results of congruence (interaction) predicting job satisfaction with Day of the week as control

	Term	Estimate	*SE*	*p*
Model: Social				
Intercept	γ_{00}	1.84	.37	.00
$Social_{bp}$	γ_{01}	-.04	.11	.73
$Social_{be}$	γ_{02}	-.06	.10	.57
$Social_{wp}$	γ_{10}	-.05	.05	.40
$Social_{we}$	γ_{20}	.01	.03	.69
$Social_{wp*we}$	γ_{30}	.00	.01	.54
Day (Monday)	γ_{40}	.04	.04	.39
Day (Tuesday)	γ_{50}	.03	.04	.53
Day (Thursday)	γ_{60}	-.06	.04	.19
Day (Friday)	γ_{70}	-.01	.05	.58
Model: Enterprising				
Intercept	γ_{00}	1.07	.44	.03
$Enterprising_{bp}$	γ_{01}	.14	.13	.29
$Enterprising_{be}$	γ_{02}	.04	.05	.44
$Enterprising_{wp}$	γ_{10}	-.02	.05	.71
$Enterprising_{we}$	γ_{20}	.00	.02	.48
$Enterprising_{wp*we}$	γ_{30}	.00	.01	.21
Day (Monday)	γ_{40}	.04	.04	.39
Day (Tuesday)	γ_{50}	.03	.04	.56
Day (Thursday)	γ_{60}	-.06	.04	.21
Day (Friday)	γ_{70}	-.01	.05	.58
Model: Conventional				
Intercept	γ_{00}	1.00	.46	.06
$Conventional_{bp}$	γ_{01}	.13	.11	.28
$Conventional_{be}$	γ_{02}	.06	.07	.58
$Conventional_{wp}$	γ_{10}	.00	.05	.63
$Conventional_{we}$	γ_{20}	-.02	.03	.40
$Conventional_{wp*we}$	γ_{30}	.00	.01	.61
Day (Monday)	γ_{40}	.03	.04	.56
Day (Tuesday)	γ_{50}	.03	.04	.50
Day (Thursday)	γ_{60}	-.06	.04	.21
Day (Friday)	γ_{70}	-.01	.05	.54

Note. $N_{level1} = 55$, $N_{level2} = 550$. Analyses were conducted separately for each RIASEC domain. Subscripts: bp = between-person interest, be = between-person environment; wp = within-person interest, we =within-person environment.

Table 19

Study 3 Results of congruence (interaction) predicting job satisfaction with affect as control

	Term	Estimate	*SE*	*p*
Model: Realistic				
Intercept	γ_{00}	1.06	.41	.02
$Realistic_{bp}$	γ_{01}	.17	.13	.24
$Realistic_{be}$	γ_{02}	-.03	.06	.64
$Realistic_{wp}$	γ_{10}	.02	.04	.61
$Realistic_{we}$	γ_{20}	.02	.03	.42
$Realistic_{wp*we}$	γ_{30}	.00	.01	.27
Positive affect	γ_{40}	.14	.04	.01
Negative affect	γ_{50}	-.14	.04	.01
Model: Investigative				
Intercept	γ_{00}	1.25	.46	.02
$Investigative_{bp}$	γ_{01}	.04	.14	.72
$Investigative_{be}$	γ_{02}	.00	.07	.78
$Investigative_{wp}$	γ_{10}	-.04	.04	.39
$Investigative_{we}$	γ_{20}	.00	.03	.72
$Investigative_{wp*we}$	γ_{30}	.00	.01	.48
Positive affect	γ_{40}	.15	.04	.00
Negative affect	γ_{50}	-.10	.04	.06
Model: Artistic				
Intercept	γ_{00}	1.28	.66	.07
$Artistic_{bp}$	γ_{01}	.02	.18	.78
$Artistic_{be}$	γ_{02}	.05	.09	.63
$Artistic_{wp}$	γ_{10}	-.04	.05	.49
$Artistic_{we}$	γ_{20}	.01	.03	.60
$Artistic_{wp*we}$	γ_{30}	.00	.01	.79
Positive affect	γ_{40}	.16	.04	.00
Negative affect	γ_{50}	-.12	.03	.01

Table 19 (cont'd)

Study 3 Results of congruence (interaction) predicting job satisfaction with affect as control

	Term	Estimate	*SE*	*p*
Model: Social				
Intercept	γ_{00}	1.43	.49	.03
$Social_{bp}$	γ_{01}	-.01	.15	.87
$Social_{be}$	γ_{02}	-.03	.10	.79
$Social_{wp}$	γ_{10}	-.07	.05	.24
$Social_{we}$	γ_{20}	.01	.03	.68
$Social_{wp*we}$	γ_{30}	.00	.01	.58
Positive affect	γ_{40}	.16	.04	.00
Negative affect	γ_{50}	-.10	.04	.06
Model: Enterprising				
Intercept	γ_{00}	.74	.36	.06
$Enterprising_{bp}$	γ_{01}	.20	.12	.12
$Enterprising_{be}$	γ_{02}	.05	.06	.42
$Enterprising_{wp}$	γ_{10}	-.02	.05	.65
$Enterprising_{we}$	γ_{20}	.00	.02	.43
$Enterprising_{wp*we}$	γ_{30}	.00	.01	.22
Positive affect	γ_{40}	.14	.04	.02
Negative affect	γ_{50}	-.13	.03	.00
Model: Conventional				
Intercept	γ_{00}	.64	.47	.23
$Conventional_{bp}$	γ_{01}	.21	.12	.12
$Conventional_{be}$	γ_{02}	.06	.07	.45
$Conventional_{wp}$	γ_{10}	.00	.04	.61
$Conventional_{we}$	γ_{20}	-.02	.03	.36
$Conventional_{wp*we}$	γ_{30}	.00	.01	.62
Positive affect	γ_{40}	.14	.04	.00
Negative affect	γ_{50}	-.13	.04	.02

Note. $N_{level1} = 55$, $N_{level2} = 550$. Analyses were conducted separately for each RIASEC domain. Subscripts: bp = between-person interest, be = between-person environment; wp = within-person interest, we =within-person environment.

Table 20

Study 3 Results of Match score predicting job satisfaction

	Term	Estimate	*SE*	*p*
Model 1				
Intercept	γ00	1.60	0.07	< .001
Matched score	γ10	0.08	0.06	0.18
Model 2				
Intercept	γ00	1.68	0.20	< .001
Matched score	γ10	0.08	0.06	0.18
Autonomy	γ20	0.00	0.00	0.68
Model 3				
Intercept	γ00	1.65	0.08	< .001
Matched score	γ10	0.07	0.06	0.26
Day (Monday)	γ20	0.01	0.07	0.86
Day (Tuesday)	γ30	-0.11	0.07	0.13
Day (Thursday)	γ40	0.01	0.09	0.85
Day (Friday)	γ50	-0.07	0.07	0.35
Model 4				
Intercept	γ00	1.43	0.15	< .001
Matched score	γ10	0.07	0.06	0.25
Positive affect	γ20	0.09	0.04	0.01
Negative affect	γ30	-0.05	0.04	0.26

Note. N_{level1} = 55, N_{level2} = 550.

Table 21

Study 3 Results of time of day predicting social interests

	Terms	**Estimate**	***SE***	***p***
Model: Social				
Intercept	γ_{00}	3.32	.08	< .001
Monday	γ_{10}	.06	.04	.12
Tuesday	γ_{20}	.00	.04	.95
Thursday	γ_{30}	-.04	.04	.36
Friday	γ_{30}	-.01	.04	.84

Note. N_{level1} = 55, N_{level2} = 550.

FIGURE

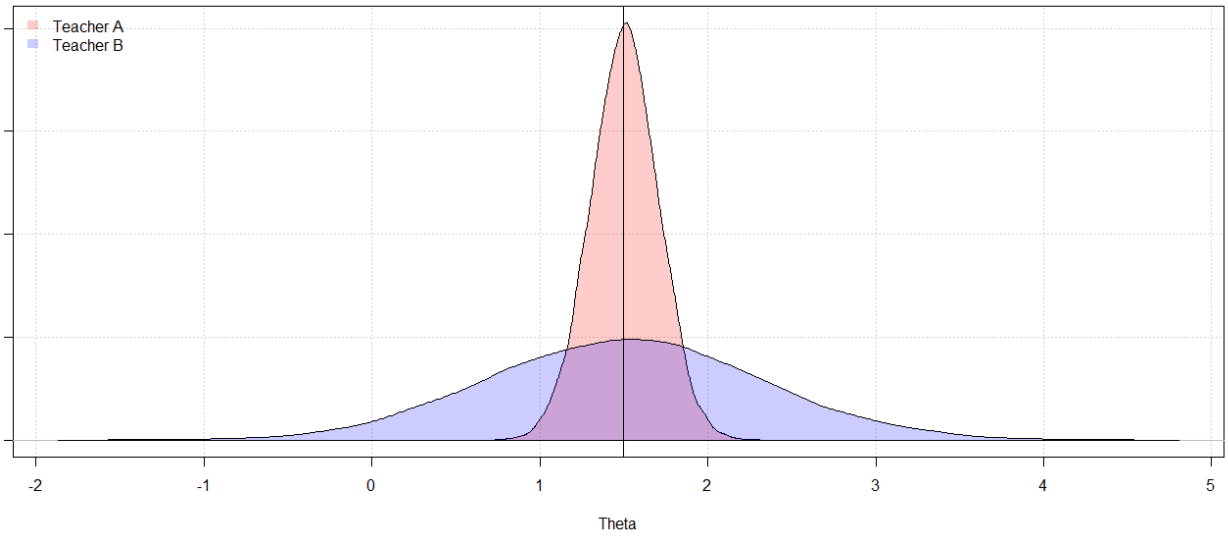

Figure 1. Social interests of teachers A and B.

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APPENDIX A: VARIANCE SOURCES FOR G-THEORY

Table 22

Variance sources for G-theory in an ESM study

Source	Term	Variability interpretation
Person		Between-person variability
Item		Item specific variability
Time		Variability due to time
Person × Item		Variability due to idiosyncratic item response
Person × Time		Within-person variability
Item × Time		Variability due in item responses over time
Person × Item × Time + e		Residual error indistinguishable from the 3-way interaction term.

Table 23
Interest item pool for Study 1 (Part 1 of 6)

	Item	RIASEC
1	Drive a truck to deliver packages to offices and homes.	Realistic
2	Repair household appliances.	Realistic
3	Work on an offshore oil-drilling rig.	Realistic
4	Monitor a machine on an assembly line.	Realistic
5	Operate a motorboat to carry passengers.	Realistic
6	Drive a taxi cab.	Realistic
7	Assemble products in a factory.	Realistic
8	Spray trees to prevent the spread of harmful insects.	Realistic
9	Build kitchen cabinets.	Realistic
10	Build a brick walkway.	Realistic
11	Set up and operate machines to make products.	Realistic
12	Repair and install locks.	Realistic
13	Enforce fish and game laws.	Realistic
14	Refinish furniture.	Realistic
15	Do cleaning or maintenance work.	Realistic
16	Prepare lawn care services.	Realistic
17	Operate a dairy farm.	Realistic
18	Put out forest fires.	Realistic
19	Maintain the grounds of a park.	Realistic
20	Test the quality of parts before shipping.	Realistic
21	Raise fish in a fish hatchery.	Realistic
22	Guard money in an armored car.	Realistic
23	Paint houses.	Realistic
24	Operate a machine on a production line.	Realistic
25	Catch fish as a member of a fishing crew.	Realistic
26	Fix a broken faucet.	Realistic
27	Lay brick or tile.	Realistic
28	Operate a grinding machine in a factory.	Realistic
29	Assemble electronic parts.	Realistic
30	Install flooring in houses.	Realistic
31	Diagnose and treat sick animals.	Investigative
32	Examine blood samples using a microscope.	Investigative
33	Investigate crimes.	Investigative
34	Investigate the cause of a fire.	Investigative
35	Study weather conditions.	Investigative

Table 23 (cont'd)

Interest item pool for Study 1 (Part 2 of 6)

	Item	RIASEC
36	Study rocks or minerals.	Investigative
37	Conduct chemical experiments.	Investigative
38	Study the history of past civilizations.	Investigative
39	Study ways to reduce water pollution.	Investigative
40	Do research on plants or animals.	Investigative
41	Make a map of the bottom of the ocean.	Investigative
42	Study the structure of the human body.	Investigative
43	Conduct biological research.	Investigative
44	Study space travel.	Investigative
45	Develop a new medicine.	Investigative
46	Develop a new medical treatment or procedure.	Investigative
47	Study genetics.	Investigative
48	Develop psychological profiles of criminals.	Investigative
49	Study the population growth of a city.	Investigative
50	Study the movement of planets.	Investigative
51	Do laboratory tests to identify diseases.	Investigative
52	Study the personalities of world leaders.	Investigative
53	Determine the infection rate of a new disease.	Investigative
54	Develop a new way to predict the weather.	Investigative
55	Invent a replacement for sugar.	Investigative
56	Study animal behavior.	Investigative
57	Study the governments of different countries.	Investigative
58	Plan a research study.	Investigative
59	Study whales and other types of marine life.	Investigative
60	Work in a biology lab.	Investigative
61	Direct a play.	Artistic
62	Sing in a band.	Artistic
63	Act in a movie.	Artistic
64	Play a musical instrument.	Artistic
65	Pose for a photographer.	Artistic
66	Edit movies.	Artistic
67	Write a song.	Artistic
68	Perform as an extra in movies, plays, or television shows.	Artistic
69	Conduct a musical choir.	Artistic
70	Design sets for plays.	Artistic

Table 23 (cont'd)

Interest item pool for Study 1 (Part 3 of 6)

	Item	RIASEC
71	Audition singers and musicians for a musical show.	Artistic
72	Paint sets for plays.	Artistic
73	Perform stunts for a movie or television show.	Artistic
74	Conduct a symphony orchestra.	Artistic
75	Direct a movie.	Artistic
76	Compose or arrange music.	Artistic
77	Write scripts for movies or television shows.	Artistic
78	Write books or plays.	Artistic
79	Dance in a Broadway show.	Artistic
80	Design artwork for magazines.	Artistic
81	Create dance routines for a show.	Artistic
82	Draw pictures.	Artistic
83	Create special effects for movies.	Artistic
84	Perform jazz or tap dance.	Artistic
85	Act in a play.	Artistic
86	Announce a radio show.	Artistic
87	Write reviews of books or plays.	Artistic
88	Write stories for articles or magazines.	Artistic
89	Sing professionally.	Artistic
90	Perform comedy routines in front of an audience.	Artistic
91	Help elderly people with their daily activities.	Social
92	Assist doctors in treating patients.	Social
93	Plan exercises for disabled patients.	Social
94	Teach children how to read.	Social
95	Perform nursing duties in a hospital.	Social
96	Help conduct a group therapy session.	Social
97	Help families care for ill relatives.	Social
98	Provide physical therapy to people recovering from an injury.	Social
99	Organize field trips for disable people.	Social
100	Do volunteer work at a non-profit organization.	Social
101	Teach an elementary school class.	Social
102	Teach children how to play sports.	Social
103	Do volunteer work at a non-profit organization.	Social
104	Help people who have problems with drugs or alcohol.	Social
105	Counsel people who have a life-threatening illness.	Social

Table 23 (cont'd)
Interest item pool for Study 1 (Part 4 of 6)

	Item	RIASEC
106	Supervise the activities of children at a camp.	Social
107	Teach disabled people work and living skills.	Social
108	Take care of children at a day-care center.	Social
109	Work with juveniles on probation.	Social
110	Teach an individual an exercise routine.	Social
111	Help disabled people improve their daily living skills.	Social
112	Help people with personal or emotional problems.	Social
113	Teach sign language to people with hearing disabilities.	Social
114	Help people with family-related problems.	Social
115	Provide massage therapy to people.	Social
116	Give career guidance to people.	Social
117	Organize activities at a recreational facility.	Social
118	Give CPR to someone who has stopped breathing.	Social
119	Teach a high school class.	Social
120	Perform rehabilitation therapy.	Social
121	Work with mentally unstable children.	Social
122	Manage a retail store.	Enterprising
123	Sell refreshments at a movie theater.	Enterprising
124	Sell candy and popcorn at sports events.	Enterprising
125	Operate a beauty salon or barber shop.	Enterprising
126	Sell merchandise at a department store.	Enterprising
127	Manage a department within a large company.	Enterprising
128	Give a presentation about a product you are selling.	Enterprising
129	Sell computer equipment in a store.	Enterprising
130	Sell telephone and other communication equipment.	Enterprising
131	Manage the operations at a hotel.	Enterprising
132	Sell a drink product line to stores and restaurants.	Enterprising
133	Represent a client in a lawsuit.	Enterprising
134	Sell a soft drink production line to stores and restaurants.	Enterprising
135	Sell merchandise over the phone.	Enterprising
136	Run a stand that sells newspapers and magazines.	Enterprising
137	Market a new line of clothing.	Enterprising
138	Run a toy store.	Enterprising
139	Sell automobiles.	Enterprising
140	Buy and sell land.	Enterprising

Table 23 (cont'd)
Interest item pool for Study 1 (Part 5 of 6)

	Item	RIASEC
141	Buy and sell stocks.	Enterprising
142	Sell restaurant franchises to individuals.	Enterprising
143	Sell compact disks and tapes at a music store.	Enterprising
144	Negotiate business contracts.	Enterprising
145	Sell hair-care products to stores and salons.	Enterprising
146	Manage a clothing store.	Enterprising
147	Sell houses.	Enterprising
148	Start your own business.	Enterprising
149	Be responsible for the operation of a company.	Enterprising
150	Manage a supermarket.	Enterprising
151	Start your own business.	Enterprising
152	Sell newspaper advertisements.	Enterprising
153	Negotiate contracts for professional athletes.	Enterprising
154	Photocopy letters and reports.	Conventional
155	Schedule conferences for an organization.	Conventional
156	Keep inventory records.	Conventional
157	Develop a spreadsheet using computer software.	Conventional
158	Assist senior-level accountants in performing bookkeeping tasks.	Conventional
159	Calculate the wages of employees.	Conventional
160	Direct or transfer phone calls for a large organization.	Conventional
161	Transfer funds between banks using a computer.	Conventional
162	Organize and schedule office meetings.	Conventional
163	Compute and record statistical and other numerical data.	Conventional
164	Use a computer program to generate computer bills.	Conventional
165	Develop an office filing system.	Conventional
166	Handle customers' bank transactions.	Conventional
167	Keep shipping and receiving records.	Conventional
168	Keep records of financial transactions for an organization.	Conventional
169	Enter information into a database.	Conventional
170	Load computer software into a large computer network.	Conventional
171	Keep shipping and receiving records.	Conventional
172	Generate the monthly payroll checks for an office.	Conventional
173	Stamp, sort, or distribute mail for an organization.	Conventional
174	Maintain employee records.	Conventional
175	Record rent payments.	Conventional

Table 23 (cont'd)
Interest item pool for Study 1 (Part 6 of 6)

	Item	RIASEC
176	Take notes during a meeting.	Conventional
177	Record information from customers applying for charge accounts.	Conventional
178	Inventory supplies using a hand-held computer.	Conventional
179	Perform office filing tasks.	Conventional
180	Operate a calculator.	Conventional
181	Proofread records or forms.	Conventional
182	Type labels for envelopes and packages.	Conventional
183	Keep accounts payable/receivable for an office.	Conventional
184	Use a word processor to edit and format documents.	Conventional

Table 24

Items for Study 2

	Item	Construct
1	In general, how well does *'talkative'* describe you?	Extroversion
2	In general, how well does *'energetic'* describe you?	Extroversion
3	In general, how well does 'assertive' describe you?	Extroversion
4	In general, how well does 'bold' describe you?	Extroversion
5	In general, how well does 'enthusiastic' describe you?	Extroversion
6	In general, how well does 'adventurous' describe you?	Extroversion
7	In general, how well does 'intelligent' describe you?	Openness
8	In general, how well does 'imaginative' describe you?	Openness
9	In general, how well does 'reflective' describe you?	Openness
10	In general, how well does 'curious' describe you?	Openness
11	In general, how well does 'sophistocated' describe you?	Openness
12	In general, how well does 'creative' describe you?	Openness
13	Conduct a musical choir	Artistic
14	Direct a play	Artistic
15	Design artwork for magazines	Artistic
16	Write a song	Artistic
17	Write books or plays	Artistic
18	Play a musical instrument	Artistic
19	Perform stunts for a movie or television show	Artistic
20	Design sets for plays	Artistic
21	Give career guidance to people	Social
22	Do volunteer work at a non-profit organization	Social
23	Help people who have problems with drugs or alcohol	Social
24	Teach an individual an exercise routine	Social
25	Help people with family-related problems	Social
26	Supervise the activities of children at a camp	Social
27	Teach children how to read	Social
28	Help elderly people with their daily activities	Social
29	Sell restaurant franchises to individuals	Enterprising
30	Sell merchandise at a department store	Enterprising
31	Manage the operations of a hotel	Enterprising
32	Operate a beauty salon or barber shop	Enterprising
33	Manage a department within a large company	Enterprising
34	Manage a clothing store	Enterprising
35	Sell houses	Enterprising
36	Run a toy store	Enterprising

Table 25
Items for Study 3

	Item	Construct
1	Build kitchen cabinets	Realistic
2	Repair household appliances	Realistic
3	Assemble electronic parts	Realistic
4	Drive a truck to deliver packages to offices and homes	Realistic
5	Test the quality of parts before shipment	Realistic
6	Develop a new medicine	Investigative
7	Study ways to reduce water pollution	Investigative
8	Conduct chemical experiments	Investigative
9	Examine blood samples using a microscope	Investigative
10	Develop a way to better predict the weather	Investigative
11	Write books or plays	Artistic
12	Compose or arrange music	Artistic
13	Create special effects for movies	Artistic
14	Paint sets for plays	Artistic
15	Write scripts for movies or television shows	Artistic
16	Help people with personal or emotional problems	Social
17	Give career guidance to people	Social
18	Perform rehabilitation therapy	Social
19	Do volunteer work at a non-profit organization	Social
20	Teach a high-school class	Social
21	Manage a department within a large company	Enterprising
22	Start your own business	Enterprising
23	Negotiate business contracts	Enterprising
24	Market a new line of clothing	Enterprising
25	Sell merchandise at a department store	Enterprising
26	Install software across computers on a large network	Conventional
27	Operate a calculator	Conventional
28	Keep shipping and receiving records	Conventional
29	Inventory supplies using a hand-held computer	Conventional
30	Stamp, sort, and distribute mail for an organization	Conventional
31	Upset	Negative affect
32	Hostile	Negative affect
33	Ashamed	Negative affect
34	Nervous	Negative affect
35	Afraid	Negative affect
36	Alert	Positive affect
37	Inspired	Positive affect
38	Determined	Positive affect
39	Attentive	Positive affect
40	Active	Positive affect
41	Fascinating	Job Satisfaction
42	Satisfying	Job Satisfaction
43	Good	Job Satisfaction
44	Exciting	Job Satisfaction
45	Rewarding	Job Satisfaction
46	Uninteresting	Job Satisfaction

APPENDIX C: SAMPLE CALCULATIONS

Calculating day- and person-mean scores, density distribution approach calculations.

Two types of scores are calculated in this dissertation across the different constructs examined (interests, personality, and affectivity): day-level and person-mean scores. This section provides a simplified example of how these scores are obtained from observed raw scores. Table C1 provides the example raw scores. For purposes of a simplified illustration is used focusing only on two realistic interest items, twice a day administration (morning and night), and ESM study duration of 2 days for 1 person.

Day-level scores

From Table C1, day-level scores are the mean of the values for each person for a particular day. Specifically, the day 1 score for person 1 is calculated: $M_{R\text{-}person1.day1}$ = (5 [item 1, morning, day 1] + 5 [item 1, night, day 1] + 4 [item 2, morning, day 1] + 5 [item 2, night, day 1]) / 4 = 4.75. Correspondingly, $M_{R\text{-}person1.day2}$ = (3+4+3+4) / 4 = 3.5.

Person-mean scores

From Table C1, person-mean scores are the mean of the values for each person for a entirety of the ESM study. Specifically, their person-mean score is calculated: $M_{R\text{-}person1}$ = (5 [item 1, morning, day 1] + 5 [item 1, night, day 1] + 4 [item 2, morning, day 1] + 5 [item 2, night, day 1]) + (3 [item 1, morning, day 2] + 4 [item 1, night, day 2] + 3 [item 2, morning, day 2] + 4 [item 2, night, day 2]) / 8 = 4.125. Correspondingly, $M_{R\text{-}person2}$ = (2+2+2+1+2+2+2+1) = 1.75.

Density distribution approach

Total variance. Total variability is calculated as the variability of all the observations in Table C1. Total variability = VAR (5,5,3,2,4,5,3,2,2,2,2,2,2,2,2,2).

Between-person variance. Between-person variability is calculated as the variability between person 1 and person 2. Between-person variability = VAR ($M_{R\text{-}person1}$, $M_{R\text{-}person2}$).

Within-person variance. Within person variability is calculated as the variability within a person. Thus, the within-person variability for person 1 = VAR ($M_{R\text{-}person1.day1}$, $M_{R\text{-}person1.day2}$).

Table 26
Raw scores for calculation illustration

		Day 1		Day 2	
Item	Person	Morning	Night	Nervous	Distressed
1. Lay brick or tile	1	**5**	**5**	3	2
2. Assemble electronic parts	1	**4**	**5**	3	2
1. Lay brick or tile	2	2	2	2	2
2. Assemble electronic parts	2	2	2	2	2

Note: This table provides sample raw scores for computation.

APPENDIX D: MODEL COMPARISONS

For Study 3, model comparisons were conducted to test the differences in the χ^2 between the base model to the model including the control variables. Results revealed that controlling for autonomy and day of week effects did not improve model for both traditional (profile correlation, see Table D1) and interaction operationalizations of fit (See Table D2). In contrast, model fit was improved when positive and negative affected were included the model for both traditional and interaction operationalizations. As highlighted previously, these models which include affect suggests that a person's mid-day affect does predict their end of the satisfaction.

Table 27

Study 3 Results of model comparisons (profile correlation) between base model and control variables

	$\chi 2$	*df*	*p*
Comparing base model to			
model including autonomy	.55	1.00	.57
model including day of the week	2.69	4.00	.62
model including affect	41.38	9.00	< .001

Note. Nlevel1 = 55, *Nlevel2* = 550.

Table 28

Study 3 Results of model comparisons (interaction) between base model and control variables

	$\chi 2$	*df*	*p*
Comparing base model to model controlling for autonomy			
Realistic	.58	1.00	.44
Investigative	.02	1.00	.89
Artistic	.09	1.00	.76
Social	.80	1.00	.37
Enterprising	1.16	1.00	.28
Conventional	.01	1.00	.92
Comparing base model to model controlling for day of week			
Realistic	2.32	4.00	.68
Investigative	2.86	4.00	.58
Artistic	1.29	4.00	.86
Social	3.26	4.00	.51
Enterprising	2.04	4.00	.73
Conventional	1.87	4.00	.76
Comparing base model to model controlling for affect			
Realistic	45.80	17.00	< .001
Investigative	59.70	17.00	< .001
Artistic	47.30	17.00	< .001
Social	69.90	17.00	< .001
Enterprising	58.60	17.00	< .001
Conventional	54.20	17.00	< .001

Note. Nlevel1 = 55, *Nlevel2* = 550.