



# Between- and within-person level motivational precursors associated with career exploration



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## ABSTRACT

Career exploration is a critical process for child and adolescent development leading people toward suitable work and developing a vocational identity. The present study examined the role of motivational precursors, namely work valences and personal agency beliefs, in explaining in-breadth and in-depth career exploration. Given the dynamic nature of motivation, we teased apart the between-person differences and within-person variabilities in motivational precursors to examine how they are independently associated with career exploration. Two hundred one high school students comprised the sample and were surveyed three consecutive years. Results revealed that work valences and agency beliefs were associated with career exploration at both the between- and within-person level. Further, when individuals exhibited greater level of agency beliefs and positive valences, they were more likely to exhibit more in-depth exploration one year later. Implications for career guidance are discussed.

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## 1. Introduction

Adolescence is an important period in the context of career development because it is the time when people prepare themselves for the world of work and develop a vocational identity (Skorikov & Vondracek, 2007). In the course of developing a vocational identity, children and adolescents learn about their personal characteristics like interests, values, and capabilities. They also contemplate on what occupations suit their personal characteristics based on direct and indirect search about the outer world, which is altogether regarded as career exploration (Patton & Porfeli, 2007).

Exploration is considered as one of the key processes for identity establishment (Erikson, 1959) but intra-individual and inter-individual variability exists in the level of exploration. For example, Kalakoski and Nurmi (1998) found that the activity of exploration is age-graded as well as socially embedded indicating that the nature and degree of exploration changes within a person over time but can also vary across people depending on their current situations. Antecedents that are known to explain variance in career exploration are motivational factors, such as self-efficacy, career interests, and achievement-orientation (Blustein, 1988, 1989; Creed, Patton, & Prideaux, 2007; Nauta, 2007; Schmitt-Rodermund & Vondracek, 1999), as well as contextual factors, such as parental behaviors (Kracke, 1997; Kracke & Schmitt-Rodermund, 2001). However, existing research typically employed cross-sectional data with fewer studies examining the question with a longitudinal dataset. Thus, we know little about how intra-individual variability accounts for career exploration. Further, a majority of the studies that examined antecedents of career exploration treated exploration as a one-dimensional construct. However, recent research suggests that career exploration can be

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observed in two different forms, namely in-breadth and in-depth exploration (Porfeli & Skorikov, 2010), and that they can have differential effects on one's vocational development (Porfeli & Lee, 2012).

The present study builds upon previous literature on how motivational factors are associated with career exploration behavior. It adds to the existing literature by differentiating two different types of career exploration behavior as focal outcomes of interest. In addition, the present study employs longitudinal data to assess how between-person differences as well as within-person variability in motivational factors explain the variance in career exploration.

### 1.1. Career exploration

Career exploration is a critical process for child and adolescent development (e.g., Gottfredson, 1981; Savickas, 1997; Super, 1990) leading people toward suitable work and meaningful careers (Flum & Blustein, 2000; Patton & Porfeli, 2007). More recently, career exploration has been cast as a lifelong process leading youth from school to work and adults from job to job in an increasingly de-structured and changing labor market (Flum & Blustein, 2000; Phillips, 1982). Career exploration has garnered a lot of attention because it is considered to be an essential component in the process of developing a vocational identity (Patton & Porfeli, 2007), which is one of the primary meta-competencies in an age of serial careers (Hall & Mirvis, 1995). Identity researchers generally agree that exploration comprises one of the core dimensions of identity development (Erikson, 1959; Grotevant, 1987; Skorikov & Vondracek, 2007). Flum and Blustein (2000) discussed that in order for one to develop a developmentally adaptive self-constructed identity, one must go through the process of learning about self and the environment (i.e., career exploration), which enables one to form a coherent sense of self at work.

Career exploration is also a contributor to more positive vocational progress during adult career development. For example, a few studies suggest that active job search behavior among young adults is associated with a greater chance of being invited for job interviews, receiving job offers, being employed, and earning higher wages (Saks & Ashforth, 2000; Vuolo, Staff, & Mortimer, 2012; Werbel, 2000). These findings suggest that career exploration yields broad and deep benefits from childhood through adulthood.

#### 1.1.1. In-depth and in-breadth career exploration

Scholars have acknowledged that career exploration can be described in two different forms, namely in-breadth (i.e., diversive) and in-depth (i.e., specific) exploration (Jordaan, 1963). In-breadth exploration involves seeking a wide array of experiences without a specific target, while in-depth exploration is more objective-oriented. This distinction has been adopted in the broader identity literature and measures of identity statuses (Luyckx, Goossens, Soenens, & Beyers, 2006). Similarly, in the career development literature, Porfeli and Skorikov (2010) found empirical support for the distinction between diversive (i.e., in-breadth) and specific (i.e., in-depth) career exploration among college students. Further, the conceptual distinction has been successfully applied to a recently developed measure of vocational identity status (Porfeli, Lee, Vondracek, & Weigold, 2011).

Each form of career exploration has its own costs and benefits. In-breadth exploration opens up greater flexibility in choosing a career (Porfeli et al., 2011) but is also associated with a lack of career planning and confidence especially when the process is prolonged (Porfeli & Skorikov, 2010). In-depth exploration is likely to be associated with greater knowledge of a specific career thereby increasing the chance of attaining a specific career goal, but it can also function as a barrier when one must change career paths in the face of a rapidly changing work context, changing life roles/imperatives, or job loss. Casting in-breadth and in-depth career exploration in developmental terms, human development is believed to proceed from a general pattern of in-breadth to in-depth exploration, but both are presumed to operate in a concurrent manner as people vacillate from "looking around" to "focusing upon" to "looking around" again in their journey toward finding and committing to a career. Those adolescents who are close to reaching their "developmental deadline" of choosing a career (Heckhausen & Tomasik, 2002) may be better positioned to adapt to the transition to work if they have engaged in substantial in-breadth as well as certain degree of in-depth career exploration. In fact, a recent study reported that only in-depth exploration, and not in-breadth exploration, was correlated with making a career commitment among university students (Porfeli et al., 2011), suggesting the critical role of in-depth exploration at a timing when making a decision is nearing. Such findings suggest that the differentiation between in-breadth and in-depth exploration can improve our understanding of individuals' career development. To achieve a clear sense of self and establish an identity, the process of in-breadth exploration helps discriminate among a multitude of choices and possible identities and in-depth exploration helps us refine and commit to one choice and vocational identity (Porfeli, Lee, & Vondracek, 2013). Taken together, researchers and practitioners should hold a balanced and more complex view of career exploration (Zikic & Hall, 2009) and further examine the antecedents and consequences of the two different forms of exploration. We expect that the differentiation between in-depth and in-breadth exploration can help us understand further the complexity of exploratory behavior devoted to career.

### 1.2. Motivational precursors of career exploration

Career exploration is a form of goal-directed behavior and, thus, can be theoretically understood from a motivational framework (Blustein, 1988). In order for one to be engaged in active exploration, motivational forces should drive one into that direction where exploration facilitates achieving a self-constructed identity (Flum & Blustein, 2000). In the present study, we focus on work valences and personal agency beliefs as motivational precursors.

### 1.2.1. Work valences

The concept of work valence was introduced by Porfeli, Lee, and Weigold (2012) to illuminate how children become attuned to the world of work years before setting work goals and making career-related decisions. They defined work valences as affective and cognitive appraisals of anticipated work outcomes. Positive and negative work valences develop early in life and affirm approach and avoidance motivations that are believed to concurrently advance and impede vocational development. Holding a strong positive valence toward work is likely to be associated with a stronger motivation to approach work, whereas maintaining a strong negative work valence is predicted to be correlated with a stronger tendency to avoid work.

Empirical evidence demonstrates that holding a positive valence is linked with attaining higher academic achievement (Porfeli, Ferrari, & Nota, 2013) and school motivation (Porfeli, Wang, & Hartung, 2008). The little research that has been conducted using these constructs suggest that positive work valences among youth can have a positive effect on their educational and occupational progression. Other research examining the role of emotions and cognitive appraisals demonstrate that positivity facilitates explorative behavior while negativity inhibits exploration. For example, one study reported that greater anxiety level was associated with lower exploratory activity (Vignoli, Croity-Belz, Chapeland, Fillipis, & Garcia, 2005). Another recent study reported concurrent positive associations between positive valence and in-depth exploration (Porfeli et al., 2012). At a more general level, positive emotions are likely to be linked with exploratory behavior (Fredrickson & Losada, 2005). Applying this line of thought to understanding of career exploration and building upon past research, it is plausible to hypothesize that adolescents with greater positive and lower negative work valences would reach out for more information about careers and for opportunities that enable them to get a job in the future. Our study extends findings from cross-sectional data (Porfeli et al., 2012) by testing a similar question with longitudinal data.

However, work valence also serves as a motivational force moving students away from career development tasks. As positive work valence waxes, engagement in career development tasks is presumed to be enhanced and as it wanes this engagement is believed to fade. Conversely, negative work valence is believed to motivate behaviors to avoid career development activities (e.g., missing appointments with a career counselor). As negative work valence waxes, people are presumed to increase their avoidance behaviors and the reverse is assumed when negative valence diminishes. This understanding leads to a complex interplay between the two forms of exploration and the two forms of valence. In light of in-depth and in-breadth exploration both advancing career development, they are expected to both be associated with positive work valence. As people view work in more positive terms, they are predicted to engage in more in-breadth and in-depth career exploration. On the contrary, in-breadth exploration may be used by some people as a tactic to avoid career development activities. By constantly “looking around” they may in fact be forestalling any appreciable progress toward choosing a career. Under this presumption, in-breadth exploration may be used by some as a means of advancing career development and for others as a strategy to stall such progress. We, therefore, predict that the relationship between positive work valence and in-depth exploration will be positive and meaningful, whereas the relationship between negative work valence and in-breadth exploration will be positive and weaker to the extent that some may be using it as a stall tactic. Assuming that exploration is generally a tactic reflecting efforts to approach the world-of work and not a tactic to avoid it, then the correlations between exploration—particularly in-depth exploration—and negative work valence are predicted to be negative to nearly zero. Negative work valence would be predicted to correlate with career avoidance behaviors, but this study is largely focusing on career approach behaviors.

**Hypothesis 1a.** Adolescents who exhibit greater positive work valences than others are more likely to show greater in-depth and in-breadth career exploration.

**Hypothesis 1b.** Adolescents who exhibit greater negative work valences than others are more likely to show lower in-depth and greater in-breadth career exploration.

### 1.2.2. Personal agency beliefs

Another potentially strong precursor of career exploration is career-related personal agency beliefs. Personal agency beliefs are conceived and operationalized as the combination of *Capability Beliefs* (the perceived personal ability to achieve goals) and *Context Beliefs* (the perceived contextual support to attain goals) (Bandura, 2001; Ford, 1992; Lent, Brown, & Hackett, 1994). Agency beliefs are regarded as a key requisite for people to initiate and sustain action (Bandura, 2001). Because career exploration behaviors represent one form of active career behavior, agency beliefs should be positively related to the initiation and maintenance of career exploration.

Empirical research focused mostly on career-related self-efficacy beliefs as one component of personal agency beliefs. An early cross-sectional study with college students reported that career decision-making self-efficacy was related to engagement in exploratory activity (Blustein, 1989), and recent studies reported parallel findings with samples of high school students in racial minority groups (Gushue, Clarke, Pantzer & Scanlan, 2006; Gushue, Scanlan, Pantzer & Clarke, 2006). Creed et al. (2007) examined the relationship between self-efficacy and career exploration across two measurement points and found that career decision-making self-efficacy in Grade 8 predicted career exploration in Grade 10 among Australian high school students. Another two-occasion longitudinal study with students in grades 10 to 12 reported that career decision self-efficacy was not only linked with career exploration concurrently in all grade levels but also predicted change in career exploration (Rogers & Creed, 2011). Our study builds upon these previous studies and extends the literature by focusing not only on self-efficacy but a more comprehensive notion of agency beliefs that encompasses both capability and context beliefs. Moreover, our use of agency beliefs is not restricted to the career decision-making process but integrates agency beliefs toward career preparation and career entry more

generally. Based on the general notion that career agency beliefs should promote active career behaviors, we hypothesized that those individuals demonstrating stronger personal agency beliefs would increasingly engage in career exploratory behavior.

**Hypothesis 2a.** Adolescents who exhibit stronger personal agency beliefs than others are more likely to show greater in-depth and in-breadth career exploration.

### 1.3. Between-person differences and within-person variability

Previous studies examining the association between motivational factors and career exploration are primarily based on between-person stability in rank order: those individuals who are more motivated to pursue a career were more likely to explore careers in breadth and in depth. However, adolescence is a time for change, so it is plausible to expect a certain degree of variability in motivation as well as in career exploration during this particular period of life. Motivational systems theory posits (Ford, 1992) that human motivational systems work in a dynamic fashion where they interact continuously with contexts. Work valences may vary from time to time as people learn about the positive and negative of work. Agency beliefs can also fluctuate as people consider different aspects of work and their capabilities to manage and navigate them. The level of career exploration is also, indeed, apt to fluctuate over time as new information presents itself and as one's motivation to pursue a career enhance or inhibit exploratory behavior (Ford, 1992). In fact, one recent longitudinal study using a Romanian sample of 8th to 12th grades reported an overall modest decline in the level of in-breadth and in-depth career exploration across one academic year (Negru-Subtirica et al., 2015). Another study reported that in-depth and in-breadth career exploration vary from time to time even on a weekly basis (Dietrich, Kracke, & Nurmi, 2011).

These findings regarding change and variability in career exploration over time suggests the possibility of both within- and between-person differences in motivational factors to account for the overall variance. In other words, those who are motivated to explore more *than others* would show greater level of exploration (i.e., between-person difference), but at times when one is more motivated *than usual* can also show greater level of exploration than usual. Longitudinal data has the benefit to model the intra-individual variation over time as well as examining inter-individual differences. Previous studies using longitudinal data tend to focus on the inter-individual differences (i.e., between-person) in the associations between motivational precursors and career exploration by adopting a multiple regression analysis (Cheung & Arnold, 2010; Creed et al., 2007; Porfeli et al., 2012). The current study, however, adopts multilevel modeling analysis (MLM) that enables the researcher to decompose the variance into difference between individuals and fluctuations (or change) over time (Hoffman, 2015). Building upon past studies, we hypothesize that the associations between motivational constructs and career exploration would show a similar pattern when examined at the intra-individual level.

**Hypothesis 3a.** At times when adolescents exhibit greater positive work valences than usual, they are more likely to show greater in-depth and in-breadth career exploration.

**Hypothesis 3b.** At times when adolescents exhibit greater negative work valences than usual, they are more likely to show lower in-depth and greater in-breadth career exploration.

**Hypothesis 3c.** At times when adolescents exhibit stronger personal agency beliefs than usual, they are more likely to show greater in-depth and in-breadth career exploration.

Another advantage of using longitudinal data is that the antecedent–consequent relation can be tested more appropriately than when using cross-sectional data. Psychological processes like motivation may take a while to be internalized and be transformed into an observable behavior. These are called *lagged effects*, and MLM can test these effects adequately (Hoffman, 2015). Our study examines these lagged effects of motivational constructs on career exploration to strictly test the antecedent–consequent relations.

**Hypothesis 4a.** When adolescents exhibit greater positive work valences at one point, they are more likely to show greater in-depth and in-breadth career exploration at the consecutive point (i.e., one year later).

**Hypothesis 4b.** When adolescents exhibit greater negative work valences at one point, they are more likely to show lower in-depth and greater in-breadth career exploration at the consecutive point (i.e., one year later).

**Hypothesis 4c.** When adolescents exhibit greater personal agency beliefs at one point, they are more likely to show greater in-depth and in-breadth career exploration at the consecutive point (i.e., one year later).

### 1.4. Present study

The primary goal of the present study was to examine motivational precursors that explain the variance in career exploration both at a within-person and between-person level. It also examined the lagged effects of the motivational constructs on career exploration. The present study has its significance in three ways. First, based on past research, we differentiated between in-breadth and in-depth career exploration and each were used as dependent variables predicted by motivational constructs. Second,

we used longitudinal data to disentangle the variability in career exploration due to differences between persons and variability over time within a person. Third, taking advantage of longitudinal data, we examined antecedent-consequent relations more strictly by testing the lagged effect of motivational precursors. Testing lagged effects of a given variable at the within-person level is relatively novel in career development research, although it has been adopted in developmental research (Almeida, Wethington, & Chandler, 1999).

## 2. Method

### 2.1. Participants

Participants of the study were high school students who were in tenth grade in a Midwestern state and were followed up for two additional consecutive waves, the interval between waves being about one year. The participants were initially recruited from seven suburban and urban high schools in the Midwest to become a part of a comprehensive evaluation of career development programs sponsored by a regional vocational education consortium. The initial study sample consisted of 327 individuals, 72% and 43% remained in the study at wave 2 and 3, respectively. Students attending “schools with a large student population size and very low student poverty” (3 schools) were more likely to remain in the study than those from “schools with an average student population size and low student poverty level” (4 schools),  $\chi^2(1) = 6.77, p < .01$  and  $\chi^2(1) = 22.94, p < .001$  for waves 2 and 3, respectively (using a typology of school districts provided by the State Department of Education). All students were invited to participate in the evaluation and were afforded the opportunity to decline. Data was shared with the investigators in a de-identified fashion for the purposes of research (IRB Protocol # 08-017, Second author's institution). For the purpose of this study, only those who had at least two occasions of data available for any given variable were included in our study ( $N = 201$ ). Retention rates were partly attributable to students choosing or not to continue their participation over time and partly attributable to students leaving the educational consortium for other schools. The mean age of participants at first time of measurement was 16.2 years old ( $SD = 0.4$ ). Slightly more than half of the sample were girls ( $n = 108, 53.7\%$ ). More than two-thirds of the sample reported to be Caucasian or White ( $n = 145, 72.5\%$ ), 20% African American or Black, 2% Asian, 3.5% Spanish/Hispanic/Latino, and 2% other or multiracial.

### 2.2. Measures

The following measures were administered within a comprehensive battery of instruments repeatedly across three occasions. Statistical characteristics of all measures including means, standards deviations, and Cronbach's alphas are reported in Table 1. Scale scores were computed only if the individual responded to at least 80% of the items. Following these criteria naturally yielded a few individuals with missing cases. As described earlier, only those individuals who had at least two points of data available for any given variable were included in the present study.

#### 2.2.1. Positive and negative valences

The positive and negative work valences were assessed with the Work Valences Scale (WVS; Porfeli et al., 2012). Work valences are a product of a complex affective and cognitive appraisal of the desired state and, thus, this construct encompasses the emotional and cognitive appraisal of working. To capture the emotions attached to work goals, respondents were given a cue question “When you are an adult doing your job, how often do you think you will feel ...” followed by items concerning positive (e.g., “excited”, 7 items) and negative (e.g., “bored”, 7 items) with the choice of responding upon a scale of 1 (*never*) to 5

**Table 1**  
Means, standard deviations, and bivariate correlations.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Positive valence T1	–														
2. Positive valence T2	.48	–													
3. Positive valence T3	.48	.56	–												
4. Negative valence T1	–.47	–.32	–.38	–											
5. Negative valence T2	–.35	–.50	–.49	.44	–										
6. Negative valence T3	–.31	–.38	–.54	.46	.58	–									
7. Personal agency beliefs T1	.42	.38	.40	–.31	–.28	–.10	–								
8. Personal agency beliefs T2	.31	.49	.37	–.18	–.29	.22	.46	–							
9. Personal agency beliefs T3	.25	.42	.54	–.19	–.30	–.25	.56	.53	–						
10. In-breadth exploration T1	.29	.30	.25	–.12	–.22	–.14	.31	.20	.20	–					
11. In-breadth exploration T2	.12	.20	.23	–.07	.00	–.04	.18	.26	.17	.44	–				
12. In-breadth exploration T3	.07	.15	.20	–.02	–.03	.01	.24	.22	.26	.37	.57	–			
13. In-depth exploration T1	.48	.39	.32	–.22	–.21	–.08	.46	.31	.29	.58	.27	.26	–		
14. In-depth exploration T2	.28	.50	.29	–.18	–.23	–.07	.32	.46	.33	.38	.50	.25	.45	–	
15. In-depth exploration T3	.15	.28	.38	–.20	–.17	–.18	.31	.43	.46	.34	.31	.49	.46	.47	–
Mean	4.02	4.06	4.01	2.20	2.22	2.32	4.26	4.25	4.26	3.66	3.65	3.56	3.90	3.84	3.84
Standard deviation	0.51	0.51	0.54	0.52	0.57	0.59	0.60	0.62	0.61	0.64	0.70	0.72	0.58	0.57	0.61

Note.  $N = 201$ . All correlations above .17 are statistically significant at  $p < .05$ .



(always). Another set of items, which had to do with the cognitive appraisals, started with “When you are an adult doing your job, how often do you think you will ...” and items of positive (e.g., “be treated fairly by your boss”, 7 items) and negative experiences (e.g., “get really tired at work”, 7 items) followed. Subscales of emotion and experiences were averaged to comprise two scales of positive and negative valences. Cronbach's alphas were .86 and .83 for positive and negative valences, respectively.

### 2.2.2. Personal agency beliefs

This measure was developed by the project investigator of the original study—second author of the current study—and consisted of two sets of items: Context Beliefs (6 items) and Capability Beliefs (6 items). To capture Context Beliefs, items were prefaced with, “Thinking about all of the people and everything that happens in your family and community, how much will they increase or decrease your chances of doing the following things as you prepare for and enter your career?” was presented and a scale of 1 (*really decrease my chances*) to 5 (*really increase my chances*) was provided to respondents to answer following items, such as “finish all of the required schooling for the job plan to do?” Similar to Context Beliefs, Capability Beliefs items were prefaced with, “Think about your talents and abilities and indicate how much you will be able to do the following things as you prepare for and enter your career.” The response scale for the items ranged from 1 (*not able*) to 5 (*completely able*). The following items were identical to the six items asked for measuring Context Beliefs. A second-order factor model, where two latent constructs loaded on one single higher order factor, yielded reasonable fit ( $\chi^2(52) = 264.76, p < .001$ ; CFI = .91, TLI = .89, SRMR = .05, RMSEA = .12) indicating that the measure has the flexibility to be used with either the two lower-order factors or one single higher-order factor (a two-factor model yielded  $\chi^2(53) = 264.76, p < .001$ , CFI = .92, TLI = .89, SRMR = .05, RMSEA = .12; a one-factor model yielded  $\chi^2(54) = 668.06, p < .001$ , CFI = .75, TLI = .70, SRMR = .10, RMSEA = .21). In this study, we combined Context Beliefs and Capability Beliefs together to measure Personal Agency Beliefs. Hence, twelve items were averaged into one scale; Cronbach's alpha was .93.

### 2.2.3. In-depth and in-breadth career exploration

Career exploration was measured using subscales from the Vocational Identity Status Assessment (VISA; Porfeli et al., 2011). In-depth exploration refers to examining a specific career and in-breadth exploration indicates scanning through a wider array of possible career options. Each item begins with “When you explore careers, to what extent do you agree with the following statements? Right now I am ...” followed by descriptions, such as “learning about various jobs that I might like” (In-breadth Exploration) and “learning what I can do to improve my chances of getting into my chosen career” (In-depth Exploration). A scale of 1 (*strongly disagree*) to 5 (*strongly agree*) was used and each subscale included five items. Cronbach's alphas were .76 and .79 for in-depth and in-breadth exploration, respectively.

## 2.3. Plan of analysis

We employed multilevel modeling (MLM) to examine the study questions (Hoffman, 2015). On the one hand, the challenge of using longitudinal data is that between- and within-person variances are all clumped together into the variance of a given variable. However, MLM technique enables to decompose the variance of any variable that is measured repeatedly over time into between- and within-person variance (Hoffman, 2015). The present study takes advantage of MLM to identify the effects of the overall difference in level between individuals and the fluctuation in motivation within an individual independently.

On the other hand, the benefit of using longitudinal data is that a stronger inference can be made by testing cause–effect relations. In studies using short-term interval longitudinal data, lagged associations between variables were examined to test antecedent–consequent relations more strictly (Bakker & Bal, 2010; Liu, Rovine, Klein, & Almeida, 2013). Estimated coefficients of any within-person level predictor in MLM suggest concurrent associations (e.g., at times when one feel competent, the person is more likely to earn higher grades). By adding a  $t - 1$  variable of the predictor in the model, it is possible to test whether there are any lagged effects of the precursors (e.g., at times when one feel competent, the person is more likely to earn higher grades the next occasion; Almeida et al., 1999; Hoffman, 2015). This method allowed us to better understand the longitudinal effects of motivational processes underlying career exploration and was expected to eventually help design effective interventions.

In MLM language, multiple levels of regression equations are written out. Level 1 of the model accounted for the individual variability across different time points (i.e. occasions nested within persons) and level 2 accounted for the between-person differences. To adequately decompose the variance of the motivational precursors, a few analytic steps were taken (Hoffman, 2015). First, we computed the grand-means for each of the variables, which is the mean of all available values of the variable. Second, we then obtained means for each participant for each variable. Because participants are measured repeatedly, each individual has their own mean score. Third, we centered the participants' mean scores for each variable by subtracting the grand mean from the participants' mean scores. This procedure allowed us to capture the between-person differences (i.e., level 2 variance). A positive value would indicate that the person's mean score is above the grand mean of the sample, namely a relatively higher mean rank compared to other people. Fourth, we centered the raw scores for each participant at each occasion by subtracting participant mean score from participant raw scores. This procedure captured within-person variability at each occasion (i.e., level 1 variance). A positive value here would indicate that the person's score at a given time is higher than the person's mean score, namely demonstrating a higher level than usual. These steps allowed us to decompose the within-person and between-person level variance of the motivational precursors.

To test the study questions, we used the PROC MIXED procedure (Singer, 1998) with maximum likelihood estimation in SAS version 9.2. Dependent variables were in-breadth exploration and in-depth exploration measured across the three time points and

these were tested in separate models. For each dependent variable, two models were estimated: (1) motivational precursors were inserted in the model as main effects. These models tested the *concurrent* relations between the predictors and outcome variable (Model 1). Then, (2) the lagged precursors were entered into the model to identify any *longitudinal* effects of the motivational precursors (Model 2). A  $t - 1$  variable was created for any within-person level motivational precursor. In Model 2, a  $t - 1$  autoregressive term of the dependent variable also was entered in the model to control for prior level variance (such as in a cross-lagged model in structural equation modeling fashion, one would control for prior occasion variance). For example, the model for motivational precursors predicting in-depth career exploration, each individual's report of in-depth career exploration at the previous wave was included as a predictor in the model. By doing this, we were able to identify the effects of motivational precursors on the career exploration above and beyond what was explained by the prior level of career exploration itself.

Preliminary analysis revealed that there was no significant time effect at the sample level. This finding indicates that there was no *mean-level change* in career exploration over time. Possibly there are only *fluctuations* in career exploration over time (Hoffman, 2015). Therefore, time was not included as a control variable. But we controlled for youth gender and age because it was considered a potential third variable (Taveira, Silva, Rodriguez, & Maia, 1998).

### 3. Results

#### 3.1. Bivariate correlations

The univariate descriptive statistics and bivariate correlations among variables are presented in Table 1. Contemporaneous bivariate correlations between in-breadth and in-depth exploration were moderately strong ( $r = .49 \sim .58$ ) suggesting some degree of synergy between the two forms. The stability coefficients of in-breadth and in-depth exploration were also moderately strong ( $r = .44 \sim .57$ ) suggesting some degree of inter-individual instability across time. In general, in-breadth exploration was only weakly associated in a positive fashion with positive work valence and personal agency beliefs. In-breadth exploration was generally not associated with negative work valence. In-depth career exploration demonstrated weak to moderate associations with all motivational constructs: All but the associations with negative work valence were in the positive direction. The contemporaneous associations between the motivational and exploration constructs were generally stronger than either the leading or lagging associations.

#### 3.2. Between-person differences and within-person variability in motivational precursors and their associations with career exploration

Intra-class correlations (ICC) for in-depth and in-breadth exploration were 43.9% and 46.4%, respectively. This result indicated that less than half the variance of career exploration could be explained by between-person differences, while the rest would be explained by within-person variability (Hoffman, 2015). Thus, examining the within-person *and* between-person level predictors of career exploration was justified.

Estimates from multilevel modeling are presented in Table 2. For each dependent variable, two models were estimated: one estimating the concurrent (simultaneous) associations between motivational factors and career exploration (Model 1), and the other estimating the lagged associations within the model (Model 2). Results indicated that adolescents who exhibit a stronger positive valence and personal agency beliefs were more likely to engage in in-breadth career exploration (H1a, H2a supported). Further, at times when individuals held a stronger negative work valence and personal agency beliefs than what they typically

**Table 2**  
Between- and within-person level motivational precursors of in-breadth and in-depth career exploration.

	In-breadth exploration		In-depth exploration	
	Model 1	Model 2	Model 1	Model 2
	Estimate (S.E.)	Estimate (S.E.)	Estimate (S.E.)	Estimate (S.E.)
Intercept	3.62 (0.05)***	3.60 (0.06)***	3.84 (0.04)***	3.82 (0.04)***
Gender (0: girls)	0.02 (0.08)	0.06 (0.09)	0.05 (0.05)	0.06 (0.06)
Age	0.21 (0.09)*	0.18 (0.10)	0.18 (0.06)**	0.15 (0.07)*
WPV Negative Valence	0.15 (0.07)*	0.10 (0.12)	−0.04 (0.06)	0.02 (0.09)
BPV Negative Valence	0.15 (0.10)	0.19 (0.12)	0.09 (0.07)	0.10 (0.08)
WPV Positive Valence	0.09 (0.08)	0.05 (0.13)	0.28 (0.07)***	0.32 (0.10)**
BPV Positive Valence	0.31 (0.12)*	0.32 (0.14)*	0.43 (0.09)***	0.39 (0.10)***
WPV Personal Agency Beliefs	0.19 (0.07)**	0.16 (0.12)	0.21 (0.06)***	0.21 (0.09)*
BPV Personal Agency Beliefs	0.26 (0.09)**	0.24 (0.10)*	0.33 (0.06)***	0.36 (0.07)***
WPV Negative Valence ( $t - 1$ )		0.07 (0.12)		0.06 (0.10)
WPV Positive Valence ( $t - 1$ )		−0.05 (0.13)		0.24 (0.10)*
WPV Personal Agency Beliefs ( $t - 1$ )		0.17 (0.11)		0.25 (0.09)**
WPV Dependent Variable ( $t - 1$ )		−0.54 (0.08)***		−0.62 (0.08)***

Note. WPV = within-person variability, and BPV = between-person variability.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

expressed over time, they were more likely to report more in-breadth exploration (H3b partly supported, H3c supported). There were no lagged associations found above and beyond the concurrent associations. (The within-person level in-breadth exploration at  $t - 1$  should be seen as a control variable. It may seem counterintuitive that the coefficient is negative, but this is common when there are only three time points of measurement occasions, because if one had a level higher than one's own average at one time, it is very likely that the person shows a lower level than the personal average at the consecutive measurement occasion).

The findings slightly differed for in-depth career exploration. Looking at the concurrent associations, adolescents who demonstrated a stronger positive work valence and personal agency beliefs compared to others showed greater in-depth career exploration (H1a, H2a supported). Further, at times when adolescents expressed higher positive valence and personal agency beliefs than their typical level across time, adolescents were more likely to engage in in-depth career exploration (H3a, H3c supported). Thus, mirroring the findings from in-breadth exploration, the variance in in-depth career exploration was attributable to both between-person differences and within-person variabilities. In contrast to in-breadth exploration, the results also signaled some lagged effects. Adolescents who reported a stronger positive valence and personal agency beliefs at one occasion were more likely to engage in in-depth exploration at the next occasion of measurement (about one year later; H4a, H4c supported). These effects were above and beyond the concurrent associations of the motivational factors, and thus provide stronger confidence in inferring antecedent-consequent relations.

#### 4. Discussion

Career exploration is a critical part of identity development. This study identified and tested known underlying motivational processes of career exploration that facilitate and inhibit career exploration. The results of this study suggest that counselors seeking to support adolescents' vocational development through in-depth career exploration tasks should attend to motivational forces like personal agency beliefs and work valences given the identified associations over time.

On a general level, our findings support previous studies demonstrating positive associations between motivational factors like self-efficacy or goal stability and career exploration (Blustein, 1989; Nauta, 2007). This supports the importance of the motivating force of how competent people feel toward a specific act as a pivotal part of human agency generally (Bandura, 2001) and driver of career development specifically (Betz, 2000). However, our study extends previous research by revealing that positive valence and personal agency beliefs are both important at the between- and within-person level. The between-person results suggest that adolescents who exhibit higher positive valence and personal agency beliefs *compared to their peers* are more engaged in in-depth and in-breadth career exploration. The within-person findings suggested that when individuals exhibit higher positive valence and personal agency beliefs *than their typical level*, they tend to become increasingly engaged in career exploration. This finding supports the contention that motivational systems work in a dynamic fashion in that they continuously interact with the context (Ford, 1992). One's motivation can fluctuate from time to time and these fluctuations also direct one to engage or disengage in behaviors. This finding has a critical implication for career interventions because it suggests that even a temporary boost in positive valence and personal agency beliefs relative to a person's historical levels may facilitate career exploration. Particularly because those who are nearing their "developmental deadline" (Heckhausen & Tomasik, 2002) are likely to benefit from a good degree of in-depth exploration (Porfeli et al., 2011), our finding that shows a positive association between within-person level motivational precursors and in-depth exploration provides further confidence for the usefulness of career guidance and interventions.

Our study also extends previous research by distinguishing between in-breadth and in-depth career exploration. We found that at times when individuals exhibit greater negative valence than is typical for them, then they tended to engage in more in-breadth exploration, a nuance that might not have been captured if exploration was measured as one combined variable. Adolescents may, therefore, engage in in-breadth exploration as a mechanism to stall if not avoid vocational identity development. While many adolescents are motivated to identify a career that suits them, imagining work to be a negative experience might hinder people from seriously digging into the specifics of a certain career and push them to navigate the world of work superficially. In light of studies demonstrating that a lack of exploration puts adolescents in a disadvantaged position in the long run by reducing the chances of employment and by lower wages (Saks & Ashforth, 2000; Werbel, 2000), maintaining a negative work valence might fuel a self-fulfilling prophecy leading to more superficial career exploration and ultimately to less suitable and gratifying work. Future studies may focus on adolescents with poor personal agency beliefs and negative work valences and the factors that may mitigate this maladaptive pattern over time.

Apart from finding concurrent effects of motivation on exploration, the within-person level of positive valence and personal agency beliefs even showed lagged effects on in-depth career exploration above and beyond the concurrent associations. This finding conforms to motivational theories asserting that positivity and agency beliefs function as forces advancing people toward goal achievement (Bandura, 1977; Ford, 1992; Lent et al., 1994).

To summarize, our study shows that motivational factors are important predictors of in-breadth and in-depth career exploration both at the between-person level and at the within-person level. Our results are aligned with a model of proactive motivation (Parker, Bindl, & Strauss, 2010) which states that motivational states like "can do" (similar to agency beliefs in our model) and "energized to" (similar to valences in our model) prompt proactive goal generation and sustain goal striving. Similar to and supporting this model, our study provides empirical support for the notion that it is important to simultaneously assess different components of motivation in order to understand individual differences in proactive behavior such as career exploration.



#### 4.1. Limitations and suggestions for future research

Certain limitations should be carefully considered when interpreting and applying the findings to future research and practice. First, the sample of the study was geographically restricted. There may have been some contextual characteristics that yielded particular findings in this study. For example, Context Beliefs might differ for youth in environments with different degrees of environmental assets and barriers. Also, the resources available for exploration may differ in other contexts. Hence, samples taken from other regions or cultures may yield different findings which may imply a critical role of the settings on motivation and career exploration. Second, we used a single source to measure career exploration but exploratory behaviors can also be assessed by objective indicators, such as the frequency of contact with people or the time spent on gathering information. Future studies could employ multiple methods of data collection from multiple angles to overcome this limitation. Third, factors other than motivational precursors may explain the variance in career exploration. Past research reported that relational factors also impact career exploration (Dietrich et al., 2011; Kracke, 2002). Future studies can further investigate different patterns of how personal factors (e.g., motivation) interact with contextual factors (e.g., parents) to understand optimal career exploration in a more nuanced way. Fourth, future studies can replicate a similar study using a “shortitudinal” design to examine if these associations still hold within a shorter time frame (Dormann & Griffin, 2015). Our study had 1-year intervals between measurement occasions, and the autoregressive correlations were moderate ( $r = .44-.58$ ). Dormann and Griffin (2015) argued that unmeasured third variables can also account for such stabilities and that using reasonably short time lags may complement such limitations as shorter time stabilities would be less likely to be biased. Also, motivational precursors may act on career exploration within much shorter spaces of time than one year. Therefore, a study using a longitudinal design with shorter intervals may improve our understanding of how and when motivational precursors affect career development behaviors.

#### 4.2. Implications

Our study demonstrates how within- and between-person level motivations may be useful to promote career exploratory behavior, which also provides implications for counselors and career guidance intervention designers seeking to advance adolescents' vocational identity development. Our findings suggest that programs strengthening work valences and agency beliefs would be particularly useful in facilitating exploratory behavior. Such programs may have an immediate and lasting impact on career exploration for a least a year following the intervention. Career guidance practitioners should also work with youth to distinguish between in-breadth and in-depth career exploration. Persistent in-breadth exploration may serve to stall identity development and may be employed as an avoidance strategy preventing career commitment. Counselors may engage youth exhibiting persistent in-breadth exploration to discover what may be preventing them from engaging in concerted in-depth exploration of careers suiting their interests and values.

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