



Stemming the tide: Predicting women engineers' intentions to leave[☆]

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ARTICLE INFO

Article history:

Received 4 January 2013

Available online 28 May 2013

Keywords:

Social cognitive career theory

Career decisions

Turnover intentions

ABSTRACT

This investigation adapts and extends the Social Cognitive Career Theory (SCCT) by integrating it with central constructs from turnover theory. The extended model proposes that domain specific self-efficacy and outcome expectations predict job satisfaction and organizational commitment – the two key job attitudes that have been established as influential predictors of turnover cognitions and behaviors. Further, we proposed that one form of organizational supports, specifically developmental opportunities at work, are sources of self efficacy and outcome expectations, and that the relationship between organizational supports and job attitudes is mediated by self-efficacy and outcome expectations. The proposed model was tested on a national sample of 2,042 women engineers. Overall, the results provided support for our newly developed model. Implications for theory, research, and practice are discussed.

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1. Introduction

Engineering is one of the most sex-segregated professional occupations in the United States today. Many millions of dollars in federal and private funding have focused on remedying that fact. In 2011, the President's Committee on STEM Education was charged with identifying and cataloging federal funding for Science, Technology, Engineering, and Math (STEM) education. They found that \$3.4 billion dollars were spent by various federal agencies on STEM education, with about a third of that (\$1,086 million) focused on increasing all underrepresented groups' participation in STEM careers and about 10% of that funding (\$13.28 million) explicitly directed towards girls and women in STEM education (CoSTEM, 2011). Most of that funding has focused on intensive early education initiatives to help promote girls' interests in math and science and introducing them to engineering as a career. The results have been successful: more women are majoring in engineering, and today, 18% of engineering graduates are women (NSF, 2012). However, only 11% of engineers are women (NSF, 2011), a rate that has been relatively constant for over two decades and the limited evidence in this area also notes that organizations are having a tough time retaining their female engineers (Society of Women Engineers, 2007). Thus, half of women who are trained to be engineers leave the field, while only 10% of men leave the field (Society of Women Engineers, 2007).

We argue that it is critical to examine factors related to women's decisions to leave engineering organizations to determine critical intervention points, and the locus of potential interventions. Because voluntary departure from an organization (and by

[☆] This project was funded by the National Science Foundation (NSF # 0827553). Any opinions, findings, conclusions, and recommendations are the authors' and do not necessarily reflect the views of the National Science Foundation.

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extension, the profession; Blau, 2007; Rhodes & Doering, 1983) is first predicted by the deliberate consideration to leave, it is important to examine the turnover intentions of women who are still employed as engineers. Thus, this study examined influences on the organizational turnover intentions of women engineers as a first step in understanding the reasons for their high departure rate from the engineering profession.

Understanding the reasons for the loss of women who are trained as engineers is more than an academic question. The skills that engineers have brought to US manufacturing and technology have played a large role in US economic prosperity (West, 2011). A 2005 National Academies report entitled “Rising above the gathering storm,” pointed out the critical relationship between technical innovation and economic prosperity. However, while the report briefly notes that U.S. women and minorities are underrepresented in science and technology, it does not address the additional loss of women from technology careers post-degree, which represents a substantial loss of talent from the technical workforce.

Psychologists have studied only aspects of this problem. For example, vocational psychologists have extensively examined how women choose to enter STEM careers and a number of educational psychologists have examined factors involved in promoting women's preparation for STEM careers (Eccles (Parsons) et al., 1983; Eccles, 2007). However, while models have been proposed and interventions developed to promote women's entry in to engineering, no one has comprehensively investigated factors related to women's decisions to leave (or conversely, to stay) in engineering organizations. Social Cognitive Career Theory (SCCT; Lent, Brown, & Hackett, 1994) one of the dominant career theories that has guided research in this area, has examined choice behavior and models that predict level of performance in an occupation, but has not examined the choice to leave an organization. The SCCT predicts that individuals' self-efficacy beliefs and outcome expectations influence their choice actions by acting indirectly on individuals' interests and choice goals; contextual supports and barriers influence the choice-making process at different stages (Lent, 2013; Lent, Brown, & Hackett, 2002; Lent, Hackett, & Brown, 2008). Sources of self-efficacy and outcome expectations include performance accomplishments, vicarious learning, verbal persuasion, and physiological arousal. Lent et al. (1994, 2003) and Lent (2013) proposed that a social cognitive career perspective would help explain career development and choices across the lifespan. However, SCCT theorists and researchers employing this perspective have seldom considered the decision to leave one's organization as a significant career choice despite SCCT's well-established validity in predicting overall student attrition from academic fields (Harvey & McMurray, 1994), and specifically, female students' barriers to consideration of STEM and other non-traditional academic fields (Fouad et al., 2010).

At the same time, the prevailing view in turnover literature is that job attitudes, in the form of dissatisfaction with one's job and lack of commitment to the organization, are positively related to intentions to leave the organization. However, turnover theory and research, while predicting withdrawal, has not included psychological factors such as self-efficacy and outcome expectations, or specific contextual supports or barriers which have been found to be instrumental in predicting career choices in general (Lent, 2013; Lent et al., 1994, 2003) and have recently been proposed to play a key role in newcomer employees' organizational attrition (Hom, Leong, & Golubovich, 2010).

Based on SCCT's established validity in predicting students' attraction to, attrition from, academic and STEM fields (Fouad et al., 2010; Harvey & McMurray, 1994), we argue that predictions of women engineers' intentions to leave engineering organizations may be most fruitfully examined by adapting the SCCT to incorporate key elements from the turnover theories in order to provide deeper insights into the turnover intentions of a highly skilled group of professionals.

This study integrates two widely prevailing theoretical perspectives that are rarely considered together (for an exception, refer Hom et al., 2010) to expand our understanding of the manner in which organizational supports influence employees' self-efficacy beliefs and outcome expectations and further act in unison to affect their job attitudes and subsequent turnover intentions. We specifically examined the role of self-efficacy and outcome expectations as possible mediators of the relationship between organizational supports and job attitudes, which in turn are expected to be related to turnover intentions.

We developed a model (see Fig. 1) by integrating key components from the SCCT and turnover models, and in doing so, we sought to deepen our understanding of each theoretical tradition in several ways. First, we aim to contribute to research on turnover intentions by explicating the mechanisms that link key SCCT psychological variables such as self-efficacy and outcome expectations with turnover intentions. Self-efficacy behaviors have been hypothesized to influence work satisfaction (Lent &

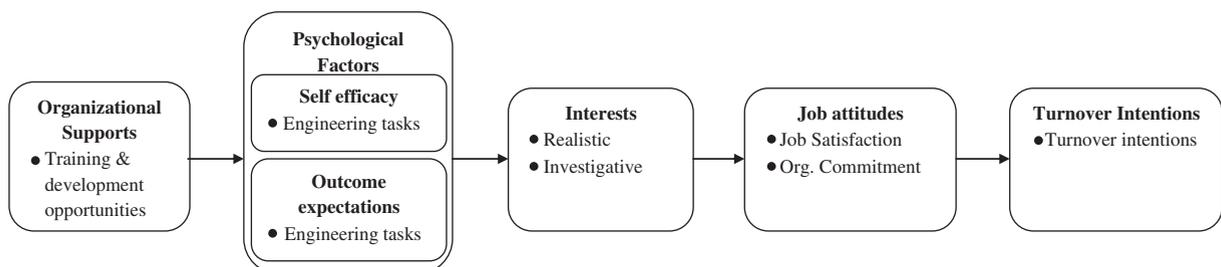


Fig. 1. Adapted SCCT model predicting turnover intentions.

Brown, 2006) and thus implicitly assumed to influence turnover intentions but this relationship has never been tested (Fouad, Fitzpatrick, & Liu, 2011; Hom et al., 2010). Second, we contribute both to the SCCT and turnover theoretical frameworks by suggesting that the demonstrated link between organizational supports and job attitudes (Lee & Bruvold, 2003) flows through its effects on work-related self-efficacy and outcome expectations. By empirically testing Lent and Brown's hypothesis of organizational supports as a source of self-efficacy and outcome expectations, which in turn are predicted to influence job attitudes, we offer a more nuanced understanding of the role of a supportive organizational context on key, influential job attitudes. Third, our approach further aims to extend the Social Cognitive Career Theory by helping explain the mechanisms that affect critical post-entry career choices such as exit and turnover intentions.

2. Theoretical background and hypothesis development

The consideration to leave's one organization represents one of the significant events in any employee's career. At the same time, the potential departure of an employee represents a disruption to the routine, normal, organizational processes at the very least, and can be a potentially expensive proposition. The departure represents a sense of loss both for the individual making that decision and for the organization that needs to make up for that potential loss (Holtom, Mitchell, Lee, & Eberly, 2008). But even the mere consideration of departure represents a loss for the organization, for we know that individuals contemplating leaving an organization are often dissatisfied with their jobs and display low levels of commitment toward their organization (e.g., Harrison, Newman, & Roth, 2006; Hom & Griffeth, 1995; Mobley, 1977). There are two key unanswered questions here: first, which psychological states predict these two key job attitudes (of satisfaction and commitment) that have been strongly implicated in research on turnover intentions? Second, given that organizational interventions in the form of supportive workplace and HR practices seldom have a direct effect on turnover intentions (Allen, Shore, & Griffeth, 2003), are there certain HR practices that an organization can proactively use to shape employees' confidence beliefs and attitudes that would dissuade them from thinking about leaving the organization? In the following sections, we explore these two questions with the help of SCCT and turnover theories. We first start with a selective review of the SCCT literature highlighting aspects of the theory most directly relevant to our understanding of exit decisions.

2.1. Social cognitive career theory

The SCCT model (Lent, 2013; Lent et al., 1994, 2003) predicts the relationships among self-efficacy, outcome expectations, interests, choice goals and choice actions as they might affect the career development process. More specifically, the model predicts that self-efficacy and outcome expectations act indirectly on goals through their influence on interests. If one perceives mastery of the skills necessary to an occupational area and believes that positive outcomes will result from engaging in that behavior, interests are predicted to develop in that occupational area. Developing interests in an area can subsequently lead to choosing to enter the occupation. The constructs of the model are related but distinct from each other. Confidence that one can accomplish a task is distinct from the expectations one has about the result of such behavior. Both of these are separate from interest in the area, the goals to engage in such behavior, and the actions necessary to implement those goals (e.g., majoring in engineering).

Lent et al. (2002, 2003) have expanded the SCCT to incorporate the concept of barriers and supports and called for research to examine their role on choice behavior. Distal and proximal contextual supports and barriers may facilitate or impede the implementation of choice. They recommended that "it would be valuable to examine the dimensionality of the contextual supports and barrier measures and to assess how particular types of supports and barriers... rather than aggregate environmental ratings, relate to choice behaviors" (2003, p. 464). Distal and proximal refer to distance from the choice action. For example, family (Ferry, Fouad, & Smith, 2000) and acculturation (Tang, Fouad, & Smith, 1999) have been found to be distal contextual influences on career choice, while financial and racial barriers have been found to influence career choices closer to the implementation of that choice (McWhirter, Torres, Salgado, & Valdez, 2007).

Most of the research focus on self-efficacy has emphasized the individual, rather than the environment, with many self-efficacy studies focusing on promoting interests (note the model suggests that higher self-efficacy in turn is related to higher interest in an area). Lent (2013) summarizes several meta-analyses that support these hypotheses. Lent further notes that while these variables have been found to predict initial career choices, those initial choices are shaped by subsequent events, commenting that it is important to consider 'career selection as an unfolding process with multiple influences and choice points' (p. 123).

While post-degree women have already chosen a career in engineering, some of the same constructs might help explain why women in engineering choose to stay in, or leave, their engineering jobs. Barriers and supports may also operate to either enhance or undermine women's career decisions related to turnover intentions and decisions. Organizational contextual factors may be sources of, or inhibitors of, self-efficacy and outcome expectations. Thus, if an organization provides a supportive work context for employees, they may be more likely to feel mastery to do the tasks related to their profession and have positive expectations of outcomes related to those tasks. Conversely, an organization that does not provide such a supportive context, or is one in which their employees perceive barriers, employees may not be confident of their ability to do the tasks related to that occupation and may have negative outcomes expected of those tasks.

2.1.1. STEM and social cognitive career theory

Women who do choose engineering and persist through the educational system to achieve a technical degree have demonstrated interest in their field (Davey, 2001), expect positive outcomes from their participation (Schaeffers, Epperson, & Nauta, 1997), possess the math, science, and engineering self-efficacy sufficient to navigate required technical coursework (Lent et al., 2003), and value the occupational characteristics of technical jobs (Eccles, 2007). Thus, one would expect that women who earn engineering degrees would be likely to persist and be successful in their careers. However, as we have noted, women's representative numbers in engineering and the physical sciences decline significantly post-degree and the occupational filter continues to narrow such that women are less and less represented in engineering over their career span (NSF, 2012; Preston, 2004; Society of Women Engineers, 2007).

2.2. Job attitudes and turnover intentions

Most of the general models of voluntary turnover intentions and behavior establish the importance of employee attitudes toward their jobs and organizations as precursors to turnover cognitions and behavior (e.g., Mobley, 1977; Steers & Mowday, 1981). Turnover intentions refer to deliberate and conscious willfulness to leave the organization (Tett & Meyer, 1993). The two key job attitudes implicated in turnover theories and research are job satisfaction and organizational commitment. Job satisfaction is commonly referred to as a psychological state that reflects cognitive and affective appraisal of one's job experiences (Brief & Weiss, 2002; Locke, 1976). Several turnover models and reviews have concluded that active consideration of leaving the organization starts with employees' low levels of satisfaction with their jobs and low levels of commitment toward their organization (Hom & Griffeth, 1995). For example, meta-analytic findings report correlations between job satisfaction and turnover intentions to range from $-.53$ (Tett & Meyer, 1993), to $-.58$ (Podsakoff, LePine, & LePine, 2007).

Besides satisfaction with one's job, loyalty and commitment toward the organization provide another compelling reason why employees may not consider quitting their organizations. Organizational commitment refers to one's feelings of attachment, identification, and involvement in the organization and is composed of three dimensions: affective, normative, and continuance commitment (Meyer & Allen, 1991). Of these three, affective organizational commitment, which reflects the strength of an individual's identification and involvement with the organization, has been most frequently researched in turnover studies (Tett & Meyer, 1993). Several theories and models of turnover emphasize the role of organizational commitment as an inhibitor of turnover intentions (e.g., Mowday, Porter, & Steers, 1982; Porter, Steers, Mowday, & Boulian, 1974). Meta-analytic evidence also supports this linkage and has shown the strength of the relation between organizational commitment and turnover intentions to be $-.58$ (Cooper-Hakim & Viswesvaran, 2005) and $-.52$ (Tett & Meyer, 1993).

There has been considerable discussion in the literature about the distinctions between job satisfaction and organizational commitment given that they are strongly correlated (e.g., meta-analytic $\rho = .65$; Meyer, Stanley, Herscovitch, & Topolnysky, 2002) and share a great deal of variance (Mathieu & Zajac, 1990). Other evidence also suggests that correlation between job satisfaction and affective commitment is stronger than what was found among the three facets of organizational commitment (Meyer et al., 2002). On the bases of this evidence, researchers have begun to treat job satisfaction and affective commitment as reflections of an overall job attitude (e.g., Harrison et al., 2006; Judge, Thoresen, Bono, & Patton, 2001), and in this study, we adopt the same approach. Based on existing theory and research on turnover phenomenon, we propose the following hypothesis:

Hypothesis 1. Job attitudes will be negatively related to turnover intentions.

2.2.1. Relationship between social cognitive factors and job attitudes

A large body of findings has accumulated on the positive work outcomes associated with self-efficacy and outcome expectations (e.g., Stajkovic & Luthans, 1998) although research directly linking self-efficacy beliefs and job attitudes continues to be relatively sparse (McNatt & Judge, 2008). Empirical evidence attests to the positive relationship between self-efficacy beliefs and job satisfaction and to a lesser degree, organizational commitment. Research by Judge, Locke, and Durham (1997) showed that generalized self-efficacy was positively related to job satisfaction. Moreover, a meta-analysis by Judge and Bono (2001) showed a $.45$ corrected correlation between generalized self-efficacy and job satisfaction. There is theoretical support for these results. Gist and Mitchell (1992) built on Bandura's original formulation and suggested that since individuals with high levels of self-efficacy are able to cope more effectively with setbacks and persevere in spite of adversity, they are more likely to attain valued outcomes and thus gain satisfaction from their jobs. Bandura (1997) himself noted that "efficacy beliefs are concerned not only with the exercise of control over action but also with the self-regulation of ... affective and psychological states" (p. 36).

A more limited stream of research has examined the relationship between outcome expectations and organizational commitment and turnover intentions. As Rottinghaus and Hauser (2013) note, outcome expectations are typically assessed via assessment of work-related values. A good fit between one's values and the values reinforced by the environment reflects an outcome expected of engaging in an occupation. Verquer, Beehr, and Wagner (2003) found that the studies of value congruence had a strong positive relationship to organizational commitment than other measures of person–environment fit.

Similar conceptual and theoretical reasoning applies to the relationship between self-efficacy and organizational commitment. Scholars have suggested that since self-efficacy helps individuals persevere in the face of setbacks, employees with higher self-efficacy may be in a better position to act proactively to shape and impact their environments thereby creating potentially better situations and experiencing higher commitment toward the organization (McNatt & Judge, 2008; Saks, 1995).

Drawing on insights from above theory and research, we suggest that women engineers with high levels of domain-specific efficacy and outcome expectations are likely to have favorable job attitudes (e.g., they will be satisfied with their jobs and committed to their organizations). Based on the foregoing discussion, we offer the following hypothesis:

Hypothesis 2. Self-efficacy will be positively related to job attitudes.

Hypothesis 3. Outcome expectations will be positively related to job attitudes.

2.3. Role of organizational supports

Organizational support theory posits that employees who encounter a supportive climate at work in the form of an organization that cares about their well-being, recognizes their contributions, and offers opportunities for recognition, promotion, and training and development will be more satisfied and committed to their jobs, and are less likely to consider quitting their organizations (e.g., Eisenberger, Huntington, Hutchison, & Sowa, 1986; Shore & Shore, 1995). Such organizational support has been shown to have a salutary effect on employees' experiences at work (Eisenberger et al., 1986).

Support for this view comes from several different theories and perspectives. Based on social exchange theory and norms of reciprocity that indicate that people feel obligated to help those that help them, Eisenberger and colleagues have argued that employees who perceive greater support from their organizations would be more likely to feel obligated to their organizations and help the organization reach its goals, and in so doing, repay their organizations (e.g., Eisenberger et al., 1986; Shore & Wayne, 1993; Wayne, Shore, & Liden, 1997). Employees can repay their organizations in many ways and one could reasonably assume that having favorable job attitudes and not thinking of quitting is one form of repayment.

This view is also consistent with the inducements-contributions framework (cf., March & Simon, 1958) that underlies much of the turnover theory (e.g., Hom & Griffeth, 1995) and suggests that employees' decisions to stay and engage in organizations reflects a balance between the inducements offered by the organization (e.g., support, rewards, advancement, and developmental opportunities) and contributions expected of the employee. We suggest that a supportive organization that provides opportunities for advancement and developmental experiences may be perceived as offering an inducement that the employee is likely to reciprocate by displaying favorable job attitudes and not thinking of quitting their jobs.

Specific practices indicative of a supportive organization include the availability of developmental experiences such as opportunities for training and development. Wayne et al. (1997) suggest that the provision of formal and informal training and development opportunities and recognition of employee contributions through advancement opportunities signal an organization's investment in their employees. Wayne et al. (1997) also used the social-exchange perspective to suggest that employees may view these opportunities as signals of an organization's continued support which the employees are likely to reciprocate with continued employment and loyalty. The availability of developmental learning opportunities has been found to be positively related to job satisfaction and affective organizational commitment (Lee & Bruvold, 2003), but has not been consistently found to predict turnover intentions (e.g., Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001; Kraimer, Scott, Wayne, Liden & Bravo, 2011). It would appear that some other factors account for the relationships among these variables.

We suggest that, in fact, developmental opportunities serve as sources of self-efficacy and outcome expectations, and that self-efficacy and outcome expectations mediate the relationship between developmental opportunities and job attitudes. For example, Lee and Bruvold (2003) noted that perceived investment in employee development helps employees be prepared for new job requirements, equips them for advancement and promotion, and for greater professional growth; these may be sources of both self-efficacy and outcome expectations. Further, Kraimer, Seibert, Wayne, Liden, and Bravo (2011) found an indirect relationship between developmental learning opportunities and turnover intentions, specifically alluding to the role of career opportunities within organization, a form of outcome expectations. In essence, the research to date points out that employees who have had the opportunities to participate in training and learning events that bolster self-efficacy to engage in work-related tasks will have greater job satisfaction and organizational commitment. Similarly, because having the opportunity to participate in developmental learning experiences signals that the organization is willing to invest in its employees, the predicted outcomes expected of engaging in work tasks are likely to be positive, and if so, would influence job satisfaction and organizational commitment. On the basis of foregoing theory and research, we offer the following hypotheses:

Hypothesis 4. Self-efficacy will mediate the relationship between developmental opportunities at work and job attitudes.

Hypothesis 5. Outcome expectations will mediate the relationship between developmental opportunities at work and job attitudes.

Finally, because self-efficacy is theoretically presumed to influence job attitudes through an influence on outcome expectations:

Hypothesis 6. Self-efficacy and outcome expectations will mediate the relationship between developmental opportunities at work and job attitudes.

In sum, the present research adapts and extends the SCCT model by integrating the core constructs of domain specific self-efficacy, outcome expectations, and organizational supports with key attitudinal precursors of turnover intentions. The

adapted model proposes that organizational support in the form of developmental opportunities at work is a source of self-efficacy and outcome expectations, which positively influences women engineers' attitudes toward their job and their organization (i.e., their job satisfaction and organizational commitment), which in turn, influence their turnover intentions.

3. Method

3.1. Sampling procedure and description

To reach the maximum number of women who earned engineering undergraduate degrees, the research team surveyed women who had graduated with an undergraduate degree in engineering, rather than those who were currently working or who had already left the field. The research team identified the top 50 universities that graduate women in engineering programs, as well as the top 20 universities that graduate Latino, African American, and Asian engineers. Combining all lists resulted in 71 universities. The deans of Colleges or Schools of Engineering were contacted and invited to be part of the study. Nearly half of the universities responded affirmatively, and in the end, thirty universities agreed to participate. Some of the universities provided the team with alumnae emails; other universities had their alumni relations officers forward the link to their engineering alumnae. Universities represented every region of the country and included very large public institutions (e.g., University of Washington, University of Maryland, University of Florida, University of Michigan, University of California-San Diego), large private universities (Stanford University, Cornell University, Massachusetts Institute of Technology), and universities that are known for technology (e.g., Georgia Institute of Technology, Virginia Tech, Iowa State University, California Polytechnic State University campuses). We were also contacted by some universities who wanted to participate by sending the link to their alumnae.

Email and postcards were used to contact engineering alumnae whose addresses were provided to the team by the university. Women interested in participating in this study were directed to a dedicated website and a link to the online survey. However, we realized that women were sending the link to their female engineering friends and co-workers. There was some media attention, in particular, on blogs focused on women in business and engineering. In the end, although we started with alumnae from 30 universities, women from an additional 200 universities participated in the survey after hearing about the study in the media and through colleagues.

3.2. Participants

A total of 5,562 women who graduated with a bachelor's degree in engineering participated and completed the study. Of this, 554 (10%) women obtained a degree but never worked as an engineer, 1,365 (29%) women previously worked as engineers but have left the field since (279 of these left less than five years ago), and 3,324 (60%) women are currently working in engineering. We focus this study on those women who are currently working in engineering. After removing missing data and doing list-wise deletion, the study sample used for testing the measurement model was 2,042.

The top majors for this group were Chemical, Mechanical, Civil, and Electrical Engineering. Forty three percent received additional degrees; most had a Master's or MBA, and 2% had earned a Ph.D. The graduates represented over three decades of engineering education: 9% graduated prior to 1984, 10% between 1984 and 1989, 7% between 1990 and 1994, 11% between 1995 and 1999, 14% between 2000 and 2004 and 12% after 2005. Most women self-identified as Caucasian (84%), with 3% identifying themselves as Latina, 2% as African American, 3% as Multiracial, and 8% as Asian or Asian-American. With regard to their marital status, 70% reported being married or in a committed relationship, while 23% reported never having married. Only a quarter reported being parents.

Current engineers reported working an average of 43.5 h a week, organization tenure of an average of 8 years, and a median income of between \$76,000 and \$100,000 a year. Among this group of respondents, two-thirds reported that the gender composition of their work group was either mostly men or all men. About half (51%) reported working as individual contributors with no direct reports, while 30% worked as project managers, and 16% were in executive positions. The top industries represented included Consulting (16%), Aerospace (10%), Electronics (6%), Education (6%), Construction (5%), Computer Engineering (4%) and Utilities (4%).

3.3. Measures

Responses to almost all scales were given on a five-point Likert scale and were computed by averaging the items. Higher values represented more positive self-efficacy beliefs, outcome expectations, positive job attitudes, higher developmental experiences, and stronger turnover intentions and greater job search behaviors. Reliability estimates for all measures exceeded .70.

3.4. Self-efficacy and outcomes expectations

3.4.1. Engineering tasks self efficacy

Engineering tasks were identified in the O*Net set of tasks common across the major engineering occupations (DOL, 2013) which included researching, designing, answering technical questions, operating software to execute designs, communicating with colleagues, supervisors and customers, troubleshooting problems, and documenting procedures. Based on these

characteristics, we developed a 21-item set of questions to assess engineering task self-efficacy. One item was dropped because of poor factor loading. The reliability estimates for the final version of the scale was .93. On a scale of 1 to 5 (with 1 = *Not at all confident* to 5 = *very confident*), participants were asked to indicate the extent of their confidence in performing a variety of common engineering tasks such as “researching the requirements or specifications for a new product or project” and “design a new product or project to meet specified requirements.”

3.4.2. Engineering tasks outcome expectations

We developed an 11-item scale to assess outcomes that might be expected of doing engineering tasks. Consistent with recommendations in constructing outcome expectations scales (e.g., Bandura, 2004; Fouad & Guillen, 2006; Lent & Brown, 2006), we included items about outcomes from the perspective of others (co-workers, managers), self-evaluation, and material goods, such as receiving raises for doing a good job. Examples of items included, “If I perform my job tasks well, then I will earn the respect of my co-workers,” “If I achieve in my job, I expect I’ll receive good raises,” “When I am successful at my work tasks, then my manager(s) will be impressed.” Responses given on a five-point scale (1 = *Strongly disagree* and 5 = *Strongly agree*) were averaged to provide a composite score with high values indicating higher levels of engineering tasks outcome expectations. The scale demonstrated good internal consistency with a Cronbach’s alpha of .84 in this sample.

3.5. Job Attitudes

Established scales were used to measure the two job attitudes: job satisfaction and organizational commitment.

3.5.1. Job satisfaction

Job satisfaction was measured with an established three-item scale by Cammann, Fichman, Jenkins, and Klesh (1983) that assessed the extent to which individuals felt satisfied with their current job (Cronbach’s $\alpha = .90$). Items included, “All in all, I am satisfied with my job.” Responses given on a five-point scale (range 1 = *Strongly disagree* to 5 = *Strongly agree*) were averaged with higher values indicating higher levels of job satisfaction.

3.5.2. Organizational commitment

The six-item affective commitment component of Allen and Meyer’s (1990) organizational commitment scale was used to assess the extent to which individuals felt a sense of belongingness and emotional attachment to their organization. Example items include, “I really feel as if this organization’s problems are my own,” and “This organization has a great deal of personal meaning for me.” Responses given on a five-point scale (1 = *Strongly disagree* to 5 = *Strongly agree*) were averaged. Higher scores indicated higher levels of commitment toward the organization. Reliability estimates for this scale were .89.

3.6. Workplace supports

3.6.1. Developmental opportunities

This four-item measure assessed the extent to which the organization offered training and development such as professional development opportunities and support to its employees (Wayne et al., 1997). Responses on a five-point Likert scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*) were averaged to indicate the extent to which employees believed their managers took an active interest in providing them with developmental opportunities. Higher scores indicate greater perception of developmental experiences. Reliability estimates for this scale were .82.

Table 1

Correlations for the observed variables in the model.

| Observed variable | 1 | 2 | 3 | 4 | 5 | 6 |
|--|--------|-------|--------|--------|--------|------|
| 1. Developmental opportunities | 1.00 | | | | | |
| 2. Engineering task self-efficacy | .12** | 1.00 | | | | |
| 3. Engineering task outcome expectations | .45** | .10** | 1.00 | | | |
| 4. Organizational commitment | .49** | .11** | .38** | 1.00 | | |
| 5. Job satisfaction | .51** | .09** | .45** | .70** | 1.00 | |
| 6. Turnover intentions | -.41** | -.05* | -.34** | -.61** | -.73** | 1.00 |

Note. N = 2042 for all correlations.

* p < .05.

** p < .01.

3.7. Turnover intentions

3.7.1. Organizational turnover intentions

A four-item instrument by Hom, Griffeth, and Sellaro (1984) was used to assess the extent to which participants were considering leaving their current organization. Illustrative item includes, "I often think about quitting my job." Responses given on five-point scale (1 = *strongly disagree* to 5 = *strongly agree*) were averaged with higher scores indicating greater intentions to leave the organization. The reliability of the scale was .91.

4. Analyses and results

Structural equation modeling using maximum likelihood in MPLUS (version 6.11) was used to run the SEM analysis. There were six scale scores utilized for this analysis. Scale scores were treated as indicators for the job attitudes latent construct while the remaining scale scores were treated as observed variables. Organizational commitment and job satisfaction scales served as the indicators for the job attitudes latent construct. The observed correlation matrix and means and standard deviations of all scales are provided in Tables 1 and 2 respectively.

Data were analyzed using complete case analysis. Complete case analysis was performed because of the 3,323 total current engineers in the dataset, only 2,288 had at least one scale score required for the analysis and of those only 122 participants had at least half of the needed data. Scholars posit that if the loss of cases due to missing data is small, biases and loss of power are both unlikely (Graham, 2009). Given the very large sample size even after list-wise deletion ($n = 2,042$) power was not an issue and biases were not foreseen given the large dataset and large portion of missing data for those cases with absent responses.

Model fit was assessed with four different fit statistics (RMSEA, CFI, TLI, and SRMR). The Root Mean Square Error of Approximation (RMSEA) fit statistic measures the degree of misfit in a model. Browne and Cudeck (1993) have suggested that RMSEA values less than .05 indicate close fit, values in the range of .05 to .08 indicate fair fit, and values greater than .10 indicate poor fit. CFI assesses model fit by comparing the proposed model with a less restrictive baseline model (Bentler, 1990). The CFI has a range of .0 to 1.0 with values closer to 1 indicating good fit and values greater than .90 are required in order to make sure models are not misspecified (Hu & Bentler, 1999). Hu and Bentler recommend a value of $\geq .95$ to indicate good fit. The TLI is similar to the CFI in that it compares the proposed model to the null model and values greater than .95 are often thought of as good fit (Hu & Bentler, 1999). The TLI is a non-normed index that penalizes overly complex models. Lastly, the SRMR was used to assess model fit. This fit statistic is an absolute fit measure that tests the standardized difference between observed and predicted correlations (Hu & Bentler, 1999). The range of the SRMR is .00 to 1.00 and a value less than .08 generally indicates acceptable fit (Hu & Bentler, 1999), while well-fitting models should result in SRMR values less than .05 (Byrne, 1998).

4.1. The proposed model

The proposed SEM model tested the relationships among developmental opportunities (i.e., training and development), engineering task self-efficacy, engineering task outcome expectations, job attitudes, and turnover intentions. The conceptual model can be referenced in Fig. 1.

The proposed model investigated the relationship between developmental opportunities (training and development) and job attitudes in order to gain insight into explaining the ultimate dependent variable: turnover intentions. The proposed model tested both the direct and indirect effects of development opportunities on job attitudes. There were three indirect paths explicitly tested. The three tested mediation effects were 1) the mediating effect of engineering task self-efficacy on the relationship between developmental opportunities and job attitudes, 2) the mediating effect of engineering task outcome expectations on the relationship between development opportunities and job attitudes, and lastly 3) the indirect effect of developmental opportunities through engineering task self-efficacy and then engineering task outcome expectations on job attitudes.

4.2. The fitted SEM model

The proposed model resulted in good fit and was used for interpretation. The estimate of RMSEA was .06 [.045, .076]; CFI = .99; TLI = .98; and SRMR = .02. The resulting SEM standardized model estimates can be referenced in Table 3 and Fig. 2. The

Table 2
Mean Values (with standard deviations in parentheses) of all observed variables.

| Scale name | Mean (SD) |
|---------------------------------------|-------------|
| Developmental opportunities | 3.63 (.82) |
| Engineering task self-efficacy | 4.17 (.59) |
| Engineering task outcome expectations | 3.90 (.59) |
| Organizational commitment | 3.34 (.88) |
| Job satisfaction | 3.74 (.89) |
| Turnover intentions | 2.15 (1.01) |

Note. Values based on $N = 2042$.

Table 3
Unstandardized, standardized, and significance levels for the fitted model.

| Parameter | Unstandardized estimate | Standardized |
|--|-------------------------|--------------|
| <i>Measurement model estimates</i> | | |
| Job satisfaction → X ₁ | 1.00* | .92 (.01)** |
| Organizational commitment → X ₂ | .83 (.02)** | .77 (.01)** |
| Error in X ₁ | .13 (.01)** | .16 (.01)** |
| Error in X ₂ | .31 (.01)** | .40 (.02)** |
| <i>Structural model estimates</i> | | |
| Developmental opportunities → engineering task self-efficacy | .09 (.02)** | .12 (.02)** |
| Developmental opportunities → engineering task outcome expectations | .32 (.01)** | .45 (.02)** |
| Developmental opportunities → job attitudes | .43 (.02)** | .44 (.02)** |
| Engineering task self-efficacy → engineering task outcome expectations | .05 (.02)* | .05 (.02)* |
| Engineering task self-efficacy → job attitudes | .02 (.03) | .02 (.02) |
| Engineering task outcome expectations → job attitudes | .39 (.03)** | .28 (.02)** |
| Job attitudes → turnover intentions | -.97 (.02)** | -.79 (.01)** |
| Residual for engineering task self-efficacy | .35 (.01)** | .99 (.01)** |
| Residual for engineering task outcome expectations | .28 (.01)** | .79 (.02)** |
| Residual for turnover intentions | .39 (.02)** | .38 (.02)** |
| Residual for job attitudes | .41 (.02)** | .62 (.02)** |

Note. Standard errors are contained in parentheses.

* p < .05.

** p < .01.

resulting path coefficients indicated a statistically significant positive relationship between developmental opportunities and engineering task self-efficacy indicating that the more training and development one reported the greater their confidence in performing engineering related activities. There was also a significant path from developmental opportunities to engineering task outcome expectations indicating that the more training and development a person reported, the greater their belief in positive outcomes from engaging in engineering tasks. The path from training and development and job attitudes was also found to be statistically significant. This path indicated that the more the engineers' availed of the development opportunities, the more positive their job attitudes.

The path from engineering task self-efficacy to engineering task outcome expectations was found to be significant and positive indicating the greater the confidence to perform engineering tasks the greater their expectations of positive outcomes. The

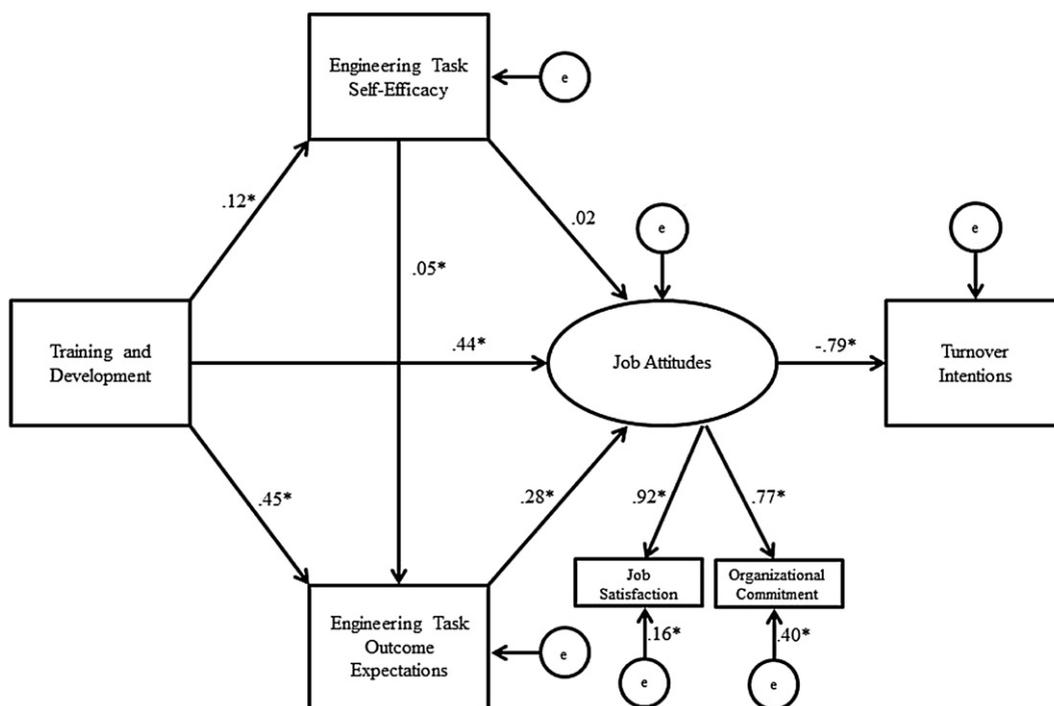


Fig. 2. Results for the structural equation model. RMSEA = .06; CFI = .99; TLI = .98; SRMR = .02; $\chi^2 (15) = 4407.99$. Note: * p < .05, ** p < .001.

relationship between engineering task self-efficacy and job attitudes was not found to be statistically significant indicating that the level of confidence employees had in completing engineering related tasks may not have had much of an influence on their job attitudes. The path from engineering task outcome expectations to job attitudes was found to be statistically significant indicating that the more individuals believe they will have positive outcomes from engaging in engineering tasks the more positive their attitudes toward their job and the organization. Lastly, the path from job attitudes to turnover intentions was found to be statistically significant and negative indicating that the more favorable attitudes employees had toward their jobs the lower their intent to leave their organization. Thus, [Hypotheses 1](#), [Hypothesis 2](#), and [Hypothesis 3](#) were supported.

4.3. Mediation analysis

Mediation analyses were performed to determine the effect of developmental opportunities (training and development) on job attitudes. The mediation effects were calculated with the built in delta method in MPLUS 6.11 ([Muthén & Muthén, 2010](#)). A bias-corrected bootstrap technique using 1000 iterations was completed in MPLUS to gain a 95% confidence interval of the estimates of the indirect effects being tested. The confidence intervals were computed using the bias corrected bootstrap technique. This method was chosen because [MacKinnon, Lockwood, and Williams \(2004\)](#) have demonstrated that bias-corrected bootstraps are the best method of obtaining accurate confidence intervals.

Results of the mediation effects can be referenced in [Table 4](#). First, to meet the necessary requirements of mediation analysis set forth by [Baron and Kenny \(1986\)](#) the total effect, direct effect, and indirect effect were investigated. The total effect (estimate = .56) was found to be statistically significant indicating there is a significant relationship between developmental opportunities and job attitudes. The direct effect of developmental opportunities on job attitudes was also found to be significant (estimate = .43) indicating that even after accounting for the indirect effects of engineering task self-efficacy and engineering task outcome expectations there still exists a direct relationship between training and development and job attitudes. The total indirect effect (estimate = .13) was found to be statistically significant which included the three possible mediation effects. Since the direct effect was still present after inclusion of the mediation effects, the estimated model resulted in partial mediation. The three proposed mediating effects were then investigated.

Engineering task self-efficacy was not found to be a significant mediator of the relationship between developmental opportunities and job attitudes. This indirect effect did not meet the necessary requirements of mediation explicated by [Baron and Kenny \(1986\)](#) where a significant path from the mediator to the dependent variable is required for a mediation effect. In the proposed mediation, the path from engineering task self-efficacy (mediator) to job attitudes (DV) was not statistically significant. Thus, [Hypothesis 4](#) was not supported.

Engineering task outcome expectations were found to be a significant, but partial, mediator of the relationship between training and development and job attitudes. This is a positive, partially mediating effect indicating that those who frequently participated in training and development opportunities reported expecting positive outcomes from performing engineering tasks which in turn reflected in more positive job attitudes. The estimate of .13 accounted for approximately 23% of the total effect between developmental opportunities and job attitudes. [Hypothesis 5](#) was thus supported.

Lastly, the indirect effect of developmental opportunities through engineering task self-efficacy and then engineering task outcome expectations to job attitudes was investigated. This effect was found to be statistically significant (estimate = .00); however, this effect was negligible and thus most likely just a result of high power due to a large sample size. The 95 percent confidence interval of the estimate of the indirect effect from the bootstrap technique was [.000, .003] indicating there is an effect, yet it is very small to be relevant for either theoretical or practical purposes. Thus, [Hypothesis 6](#) was not supported.

5. Discussion

The findings of this study support the importance of integrating key constructs from vocational psychology and turnover research to offer a more nuanced explanation of voluntary turnover intentions. Using the central constructs of self-efficacy,

Table 4
Mediation analysis of the effect of developmental opportunities on job attitudes.

| Effect | Unstandardized estimate | Standardized estimate | 95% confidence interval |
|--|-------------------------|-----------------------|-------------------------|
| Total effect | .56 (.02)** | .56 (.02)** | [.531, .596] |
| Total indirect effect | .13 (.01)** | .13 (.01)** | [.104, .154] |
| Direct effect | .43 (.02)** | .44 (.02)** | [.391, .479] |
| Indirect effects | | | |
| Developmental opportunities → engineering task self-efficacy → job attitudes | .00 (.00) | .00 (.00) | [−.003, .007] |
| Developmental opportunities → engineering task outcome expectations | .13 (.01)** | .13 (.01)** | [.100, .150] |
| Developmental opportunities → engineering task self-efficacy → engineering task outcome expectations | .00(.00)* | .00 (.00)* | [.000, .003] |

Note. Standard errors are contained in parentheses. The 95 percent confidence interval is for the standardized estimate and was calculated using a 1000 iteration bias corrected bootstrap technique in MPLUS version 6.11.

* p < .05.

** p < .01.

outcome expectations and contextual supports from the Social Cognitive Career Theory (SCCT), we combined it with two key job attitudes that are influential in turnover models, to predict the extent to which women engineers express intentions to leave their organizations. Using a large, national sample of 2,042 women engineers, we found that self-efficacy and outcome expectations influenced women engineers' job satisfaction and organizational commitment, which in turn influenced their turnover intentions. We also considered what role, if any, supportive HR practices in the form of developmental opportunities played in influencing engineers' job attitudes and their subsequent turnover intentions. The results pointed out that the availability of developmental opportunities at work are related to higher self-efficacy and outcome expectations, and indirectly, are also related to positive job attitudes. Taken together, these results offer new and thought-provoking insights into the process of making career decisions among highly skilled employees who are contemplating quitting their jobs.

There are three noteworthy sets of findings that emerged from this study. First, one of the overarching goals of this study was to test whether some of the key constructs in the SCCT model that predict career entry decisions are effective in predicting organizational exit intentions as well. Our findings support the prediction that SCCT constructs of self-efficacy and outcome expectations play an important, but distal, role in influencing turnover intentions, and they do it through their effect on job attitudes. In doing so, the study contributes to the SCCT literature by providing empirical verification of the [Lent and Brown's \(2006\)](#) work satisfaction model, and adapting and expanding the theoretical lens to include turnover related intentions and behaviors as significant career choices. Likewise, these findings make an important contribution to turnover theory by illuminating the role of self-efficacy beliefs and outcome expectations whose influences on organizational departure decisions have remained virtually unexplored.

Moreover, our results also offer new insights into the potential sequence by which organizational supports influence career choices. Specifically, we found that supportive organizational practices, in particular, the availability of developmental opportunities such as training and professional development programs, are positively related to women's engineering task self-efficacy and also the positive outcomes they expect from successfully performing engineering tasks. Outcome expectations, in turn, were found to be positively related to job attitudes in that the more positive the outcomes engineers expected from performing their tasks, the greater their levels of satisfaction with their jobs and loyalty toward their organizations, and lower their intentions to leave their organizations. According to the SCCT model, workplace supports can act at different stages in the choice-making process. Following the recommendations of [Lent and Brown \(2006\)](#), we found that workplace supports in the form of developmental opportunities played a greater role in shaping efficacy beliefs and outcome expectations and were less instrumental in shaping choice actions such as organizational turnover intentions. In presenting these results, we offer a sharper and more refined portrayal of the role of organizational supports on choice behavior.

This nuanced view also contributes to the turnover literature which has grappled with empirically demonstrating the role of supportive organizational practices in influencing turnover intentions ([Allen et al., 2003](#)). In addition, the mechanisms underlying this relationship still remain relatively unexplored and the limited research that exists tends to identify job attitudes as chief explanatory factors. By integrating key SCCT tenets with organizational support and turnover theories, our results demonstrate that supportive organizational practices, in the form of developmental opportunities, may operate partially through their effects on employees' positive expectations from engaging in specific tasks which enhances their job attitudes. Further, in our study and other research, more positive job attitudes have been associated with lower intentions to quit. Overall, the results suggest that developmental opportunities are indeed associated with lower turnover intentions partly because of more positive expectations that engineers expect from performing their tasks and also because of favorable job attitudes.

We found that despite the positive correlations between self-efficacy and job attitudes, the mediational role of self-efficacy was completely muted in this study. In contrast, outcome expectations emerged as a key mechanism that channeled the influence of supportive organizational practices on job attitudes. By elucidating the role of outcome expectations within the potential unfolding sequence by which organizational support is negatively related to turnover intentions, our findings simultaneously extend our knowledge in several theoretical traditions such as SCCT, turnover, and organizational supports frameworks.

Another noteworthy contribution of our study centers around the relationship between developmental opportunities and self-efficacy and outcome expectations. As shown by our results, and in line with several theoretical traditions (referenced above), developmental experiences play a pivotal role in equipping engineers with requisite self-confidence in performing their engineering tasks and positively influencing their outcome expectations. Taken in conjunction with the mediational results, our study offers a more fine-grained assessment of the relative importance of self-efficacy and outcome expectations as effective conduits of the influence of workplace supports on job attitudes and more distal choice actions. These findings suggest a potential refinement to the SCCT model by placing the effects of contextual supports farther from the decision expression point, and elevating the role of outcome expectations, especially among a group of highly skilled professional employees within a chosen occupation. It would appear that developmental opportunities are a stronger source of outcome expectations than of self-efficacy, but future research should examine other environmental conditions that may influence self-efficacy as well as outcome expectations.

We first tested our model by examining the paths from domain specific engineering tasks self-efficacy and outcome expectations to vocational interests and then examined the paths from interests to job attitudes and subsequent turnover intentions. We found this model to have poor fit. In contrast, when we tested the paths from self-efficacy and outcome expectations to turnover intentions via job attitudes (excluding vocational interests), we found the model to have a better fit. In other words, we found that women engineers who exhibited high levels of confidence in performing engineering tasks and expected positive outcomes from performing these tasks, tended to have more positive job attitudes that negatively influenced their desire to leave their organizations. These results led us to rethink the role of interests in populations that are already engaged in a given occupation. By testing the SCCT model on a group of working adults, with stable interest patterns within a specific occupation, the results suggest a refinement to the SCCT

performance model by identifying a different set of mechanisms that link self-efficacy beliefs, outcome expectations, and career decisions and do not necessarily flow through vocational interests.

5.1. Implications for theory, research, and practice

Our results offer a number of important implications for theory, research, and practice. First, our adapted and integrated SCCT framework expands the criterion of interest to encompass organizational turnover intentions as an important choice outcome. The original SCCT model was proposed to explain students' vocational and academic choices, persistence and withdrawal decisions. By integrating the constructs of self-efficacy, outcome expectations, and contextual supports that underlie the SCCT theory with specific theoretically and empirically prominent antecedents of turnover intentions, our study contributes to both SCCT and turnover theories. In particular, our results support the theoretical extension to the SCCT model and indicate that the adapted model is useful in predicting career choices of individuals once they complete their occupational training and establish themselves in their chosen occupations.

Moreover, by integrating key SCCT constructs with the affective paths known to influence turnover phenomenon, we offer deeper insights into why highly skilled employees contemplate leaving their organizations, and in doing so, strengthen the explanatory power of the SCCT model. Although our model was tested on a group of highly skilled women working in the male-dominated engineering profession, we believe it offers a versatile framework that can be adapted to explain departure decisions confronting different populations working in different professions. Finally, our model also extends one of the newer formulations of SCCT-turnover relationship that focused on attrition rates and behaviors of newcomers (Hom et al., 2010) and offers new and unique insights into the choice-making process engaged in by self-efficacious, satisfied, and committed employees with considerable tenure in their organizations.

Another way that our findings extend the SCCT model is by providing thought-provoking evidence about the role of vocational interests among professionally established employees who are *not* contemplating a career change. Although Lent et al.'s (1994) original model suggests that the role of vocational interests changes as individuals go through different stages of forming and implementing academic choices and pursuing specific career activities, the findings from our study highlight that self-efficacy beliefs and outcome expectations *directly* shape employees' affective outcomes and indirectly influence subsequent turnover intentions. Given the diminished and non-significant role that vocational interests played in our findings, perhaps it is more useful to cast vocational interests in models dealing with career change and withdrawal rather than organizational turnover intentions and behaviors.

With the exception of a few studies (e.g., Lee & Mitchell, 1994), most turnover research has ignored distal predictors of turnover intentions and behaviors. The findings of this study demonstrate the usefulness of considering more distal psychological predictors of turnover phenomena such as self-efficacy beliefs and expected outcomes of performing certain behaviors. By showing how these distal career constructs are shaped by supportive organizational practices, and in turn, influence the more proximal attitudinal precursors to turnover, our adapted model provides an expanded lens with which to understand and predict turnover phenomenon. This study also helps to address some of the recent calls (Hom et al., 2010) for more research that examines the links between two well-established fields of study that examine individuals' persistence and withdrawal decisions.

The findings from this research also offer practical implications. First, knowing that strong outcome expectations do indeed indirectly influence turnover intentions, organizations interested in retaining professionals might like to consider creating conditions that help foster positive outcome expectations especially in domains that may be relevant to individuals' work accomplishments, and in doing so, prevent them from contemplating leaving their organizations. It would appear that developmental opportunities offer the potential for role modeling, feedback on performance, and verbal persuasion that help employees to expect more positive outcomes when engaging in engineering tasks.

Second, our results on the direct role of organizational supports on engineers' self-confidence abilities and outcome expectations, and indirect role of supports on job attitudes and subsequent turnover intentions, suggests that organizations may find some value in offering a variety of interventions that can boost outcome expectations and enhance job satisfaction and commitment in a manner that engineers are less likely to want to leave their organizations. For example, by tasking their human resource departments to offer training and development opportunities and thereby creating a supportive workplace that promotes employees' expectations from performing well, organizations can begin to stem the tide of departure by bolstering the ensuing job satisfaction and commitment to the organization.

These results also raise pointed questions regarding the practical role of different SCCT constructs in shaping career decisions. For example, are interventions more effective if geared towards bolstering supports in the environment in which the engineers work, or should they be geared towards making outcome expectations more realistic, or helping increase self-confidence for work-related tasks?

5.2. Limitations and suggestions for future research

Although we noted several theoretical and empirical contributions, like all studies, ours has limitations. These limitations suggest some caution in interpreting the study findings but at the same time, also offer several avenues for future research. First, all responses were collected from one single source that makes it vulnerable to common-method variance. We employed one possible way (Podsakoff, MacKenzie, & Podsakoff, 2012) to mitigate the effects of this bias by "psychologically separating" the possible linkages between predictor and criterion variables that appeared in our survey. However, this in and of itself, may not be

sufficient to completely overrule common method bias. Future research needs to follow some of the recommendations outlined by Podsakoff and colleagues in designing research studies that minimize the occurrence and impact of common method bias.

Because of the design, a second and related limitation is that we cannot completely rule out alternative causal mechanisms that influence turnover phenomena. Although we used well-established theories to guide the causal ordering of variables and our extensive analyses on alternative pathways ruled out other possible explanations of turnover intentions, there still remains a slim chance that we have fully ruled out other means of explaining the dependent variable. Future research could consider employing a field or a quasi-field design to document and manipulate the different variables used in our model as well as a longitudinal design that aims to capture the paths to actual turnover decisions.

A third limitation stems from our exclusive focus on women engineering professionals which limits the generalizability of our study results. This limitation also presents an opportunity for future researchers to test our proposed model on different groups of employed individuals. The theories that informed the model development in this study were all previously tested and refined on diverse samples of employees and students from different occupational and professional backgrounds which give us confidence that our model is potentially generalizable to populations other than female engineers. For example, further research should examine the model with men, with more racially/ethnically diverse groups, and also other occupational groups. This study examined women in a male-dominated occupation, and other studies could examine more gender-balanced occupations, such as medicine, or men in female-dominated occupations, such as nursing. Further research could also examine women in other male-dominated occupations such as computing, physics, or economics.

6. Conclusion

The continued scholarly interest in turnover has led to the development of innovative theories and insightful research that has enriched our understanding of this phenomenon. The current study continues this trend by offering a new approach to understanding why highly-skilled, attrition-prone group of employees contemplates leaving their organizations.

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