



Social cognitive model of adjustment to engineering majors: Longitudinal test across gender and race/ethnicity[☆]



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ABSTRACT

We conducted a longitudinal test of a social cognitive model of academic adjustment in a sample of 732 engineering students. The model, designed to explain students' satisfaction with and intentions to persist in their majors, integrated features of social cognitive career theory's (SCCT) segmental models of satisfaction, interest, choice, and performance (Lent & Brown, 2006; Lent, Brown, & Hackett, 1994). Students completed measures of academic support, self-efficacy, outcome expectations, interests, satisfaction, positive affect, and intended persistence at three time points (at the end of their second, third, and fourth semesters in engineering). A bidirectional version of the model offered good fit to the data, both in the larger sample and across gender and racial/ethnic groups. Self-efficacy was the most reliable direct predictor of academic satisfaction and intended persistence across the third and fourth semesters, though other social cognitive variables also contributed, either directly or indirectly, to predictions at one time point or the other. We consider implications of the findings for further research and practice on academic adjustment and persistence in STEM fields.

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One notable focus of inquiry in vocational psychology in recent years has been on the study of factors that predict engagement in science, technology, engineering, and mathematics (STEM) careers. Given concerns about the narrowing of the STEM “pipeline” as people move through the educational system, much of this research has involved student samples, including groups that have historically been under-represented in particular STEM fields (e.g., women in engineering). Social cognitive career theory (SCCT; Lent, Brown, & Hackett, 1994, 2000) has often been employed in this research as a basis for understanding engagement in or avoidance of STEM activities. For example, SCCT's interest and choice models have been examined in female, male, and racially diverse samples in engineering (Lent et al., 2005), biological/life sciences (Byars-Winston, Estrada, Howard, Davis, & Zalapa, 2010), and computing disciplines (Lent, Lopez, Sheu, & Lopez, 2011). (See Flores et al., 2014, and Navarro, Flores, Lee, & Gonzalez, 2014, for recent reviews of this literature.)

1. Integrative model of interest, satisfaction, and choice stability

Although consisting of a common core of predictors, SCCT's interest, choice, satisfaction, and performance models have often been studied as separate segments of academic and career development. However, Lent et al. (2013) recently noted the advantages of combining elements of these models into an integrative framework that, among other things, can illuminate the interplay among interest

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and satisfaction as these variables relate to both initial and subsequent educational and occupational choices. This larger, integrative framework may also be seen as offering a window on the process of engagement in particular fields, where engagement consists of multiple adjustment dimensions, such as satisfaction with and intentions to remain in the field's educational environment. The same framework may also be used to understand (and, in some cases, prevent) the process of disengagement or defection from particular fields.

The integrative SCCT model, shown in Fig. 1, consists of domain-specific environmental supports, self-efficacy, outcome expectations, interests, satisfaction, personality traits, and choice goals (or, where initial choices have been made, persistence intentions). (The model can also be extended to include choice actions, that is, behaviors designed to implement, maintain, or change one's choice goals.) In keeping with SCCT, self-efficacy refers to beliefs about one's capability to perform particular behaviors or courses of action; outcome expectations represent the consequences one anticipates from performing these actions; choice goals involve one's intentions to perform these actions; and supports refer to environmental resources that can facilitate one's goal pursuit. Interests involve the extent to which people like particular school or work activities, and satisfaction is defined as one's enjoyment of the educational or occupational environment in which these activities occur. Personality traits, or affective tendencies, such as positive affectivity (the general tendency to experience positive affect), represent dispositions that contribute to the experience of domain-specific satisfaction (Lent & Brown, 2006).

Lent et al. (2013) posited and tested the following hypotheses in a sample of students initially planning to major in engineering (the path letters are shown in Fig. 1): having interests in the activities that define one's academic major (and being able to pursue these interests) is likely to promote satisfaction with the major (path a). Together, interests (path b) and satisfaction (path c) nurture persistence intentions (and actual persistence) because people generally wish to keep performing activities they like and to remain in environments they find satisfying. It was also suggested that satisfaction would at least partially mediate the relationship of interests to persistence intentions (i.e., the path from interest to persistence intentions would lead through satisfaction).

The remainder of the paths in the integrative model were adapted from SCCT's interest, choice, and satisfaction models: Self-efficacy and outcome expectations are seen as precursors of interests (paths d and e, respectively), reflecting the assumptions that interests tend to blossom in relation to activities that people feel efficacious performing and perceive as likely to lead to valued outcomes. Self-efficacy (path f), outcome expectations (path g), and environmental supports (path h) are seen as determinants of satisfaction with one's academic or work life. That is, people are likely to be satisfied with their choice paths when they feel competent at performing the requisite activities, expect to receive positive outcomes from performing them, and perceive they have access to supportive resources. Trait positive affect is also seen as contributing to satisfaction (path i) as well as to perceptions of self-efficacy and environmental support (paths j and k, respectively).

Environmental support is posited to be a precursor of both self-efficacy and outcome expectations, and self-efficacy is assumed to predict outcome expectations (paths l, m, and n, respectively). Finally, favorable beliefs regarding self-efficacy, outcome expectations,

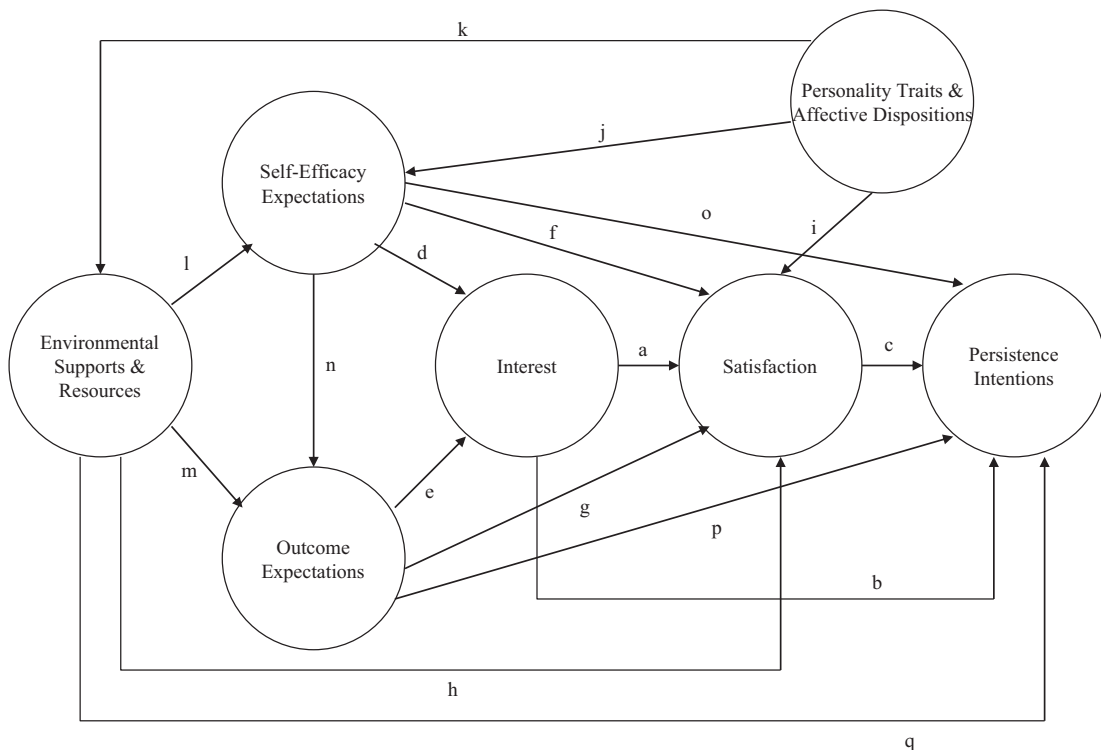


Fig. 1. Integrative model of interests, satisfaction, and choice stability.

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