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Applying social cognitive career theory to predict interests and choice goals in statistics among Spanish psychology students

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ABSTRACT

This study investigated the usefulness of social cognitive career theory—SCCT (Lent, Brown, and Hackett, 1994) in predicting interests and goals relating to statistics among psychology students. The participants were 1036 Spanish students who completed measurements of statistics-related mastery experiences, self-efficacy, outcome expectations, interests and goals/intentions. Structural equation modeling (including multi-group analysis) was used to test the fit of the hypothesized models to the data. Results indicated support for SCCT as a way to predict students' interests in statistics and their intentions of engaging in academic or professional activities where statistics is used. Collectively, the predictors accounted for 50% of the variance in interests and for 77% of the variance in goals. Implications both for future research on SCCT and for intervention in statistics education are discussed.

Introduction

Lent, Brown, and Hackett (1994, 2000) outlined a comprehensive framework based on social cognitive theory (Bandura, 1986) to explain and predict the process involved in the development of vocational and academic interests, how vocational and academic choices are made, and how academic performance is achieved. Since then, numerous empirical studies in the United States have tested models derived for social cognitive career theory (SCCT) with university students, mainly in math and science-intensive fields and activities (e.g. Bishop & Bieschke, 1998; Ferry, Fouad, & Smith, 2000; Gainor & Lent, 1998; Lapan, Shaughnessy, & Boggs, 1996; Lent et al., 2001, 2003, 2005; Lent, Lopez, Lopez, & Sheu, 2008), as well as in other areas (e.g. Diegelman & Subich, 2001; Fouad, Smith, & Zao, 2002; Tang, Fouad, & Smith, 1999). As the findings generally support SCCT propositions (see Sheu et al., 2010), in recent years researchers have also been testing social cognitive hypotheses in different cultural contexts and educational systems, including Japan (Adachi, 2004), Italy (Lent, Brown, Nota, & Soresi, 2003), Portugal (Lent, Paixão, da Silva, & Leitão, 2010) and Turkey (Özyürek, 2005).

According to Lent et al. (1994) the core of SCCT proposes that the individual's interests reflect the interaction between his or her self-efficacy beliefs and outcome expectations over time. Therefore the determination to engage in a particular activity or to produce a particular outcome (choice goals/intentions) can be explained as a result of interests and self-reference beliefs. In addition to postulating relationships among key theoretical constructs, SCCT incorporates the effects of individual differences and environmental influences on interest, choice and performance.

An important aspect of SCCT is its domain-specific nature, as the social cognitive view of person and context differs from that of trait-oriented career theories, given that "SCCT is more concerned with relatively dynamic and situation-specific aspects of people (e.g. self-views, future expectations) and their environments" (Lent & Brown, 2006, p. 13). Because the theory deals with domain-

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specific aspects of human functioning, theorists consider that social cognitive constructs should be examined within specific domains (Bandura, 1986, 2006; Lent & Brown, 2006). Therefore, the agenda for SCCT research includes testing social cognitive hypotheses across subject-matter domains and examining whether the relationships among social cognitive constructs are similar (see e.g. Betz & Hackett, 2006; Fouad et al., 2002).

In this context, the aim of the present study was to test social cognitive career theory in the field of statistics for non-mathematical university students. To our knowledge, this domain has not been examined by SCCT researchers before. Specifically, this research examined the usefulness of core SCCT interest and choice models in predicting statistics-related interests and choice goals among Spanish psychology undergraduates. Therefore, this study also seeks to extend previous research by testing SCCT hypotheses in a Spanish university setting. In addition, university students' difficulties in attaining an adequate performance in their statistics courses, coupled with their negative attitudes and beliefs about statistics, have been widely documented all over the world for over two decades (for a review see e.g. Blanco, 2008). Based on over 15 years' research and applied experience, SCCT can be viewed as a potential basis for conceptualizing and designing career-development interventions in the field of statistics, including efforts to expand interests and choice goals among students of social science, psychology, education and other non-mathematical subjects.

This study examined several basic SCCT predictions about self-efficacy, outcome expectations, interests and goals. Specifically, the research focused on testing five principal hypotheses:

Hypothesis 1. Statistics self-efficacy and outcome expectations predict interests in statistics.

Hypothesis 2. Interests in statistics are predictive of the goals or intentions of students to engage in statistics-related activities in their future career.

Hypothesis 3. Statistics self-efficacy contributes to statistics outcome expectations and also affects interests in statistics indirectly through outcome expectations.

Hypothesis 4. Outcome expectations affect statistics-related intentions both indirectly (through interests) and directly.

Hypothesis 5. Statistics self-efficacy has a significant indirect effect on goal/intentions through outcome expectations and interests.

Since these five hypotheses concerning the SCCT core have received the strongest empirical support to date–and particularly those referring to direct effects– they were considered the principal predictions in this preliminary study. In addition, the study examined the role of mastery experiences in the development of statistics-related interests and intentions using an exploratory approach, by comparing two alternative models, model A and model B (see Fig. 1).

According to social cognitive theory, self-efficacy is mainly developed through successful mastery experiences (Bandura, 1986). In prior research on SCCT, several studies tested the direct effect of mastery experiences on self-efficacy, and their results supported this proposition (Ferry et al., 2000; Fouad et al., 2002; Lapan et al., 1996; Lopez, Lent, Brown, & Gore, 1997). Therefore, the direct effect of personal accomplishment on statistics self-efficacy was included in both models (*hypothesis 6a*). As an exploratory extension of this hypothesis, it was hypothesized, also in both models, that mastery experiences have a significant indirect effect on the other factors (outcome expectations, interests and intentions) through self-efficacy (*hypothesis 6b*). In view of the fact that only a limited number of studies have examined the direct and indirect effects of mastery experiences on the rest of the social cognitive constructs, the results of this work may contribute to increasing the knowledge of the role played by the main source of self-efficacy in SCCT interest and choice models.

Furthermore, one of the frequent findings of research into statistics education is the significant relation between performance or previous experience (constructs which are close to mastery experiences) and attitudes to statistics, the measure of which usually includes behavioral intentions (see Blanco, 2008). Therefore a tentative hypothesis was formulated in order to examine more closely the nature of the relationship between mastery experiences and intentions or goals. In *model A* the effect of mastery experiences on intentions was fully mediated by self-efficacy, so additional paths were not included. However, *model B* was defined as a partially mediated model in which mastery experiences affected goals/intentions both indirectly through self-efficacy

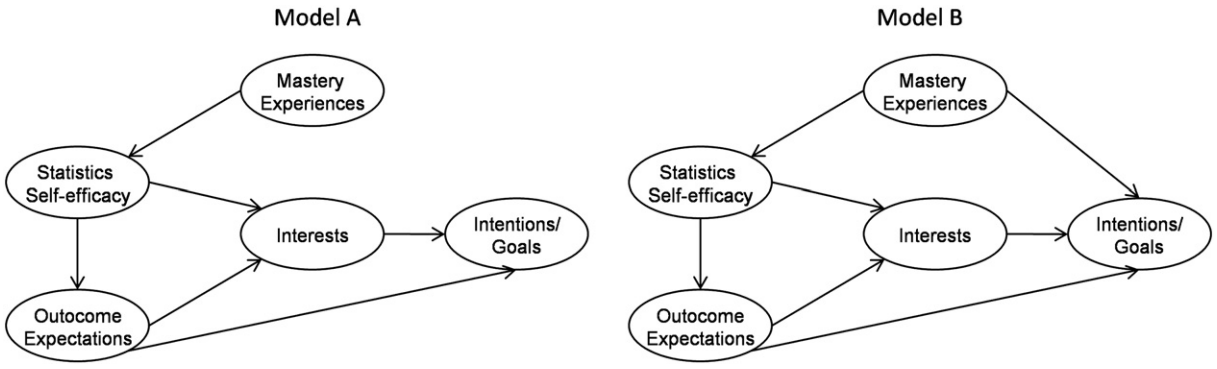

Fig. 1. The social cognitive career models tested.