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Empirical Evidence for a Socio-Cognitive Model of Academic Satisfaction: A Review and Meta-Analysis Approach

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The study of Academic Satisfaction (AS) has increased as researchers and educators recognized AS as a key variable to explain problems regarding academic performance, motivation and retention. Moreover, actual research sustains the importance of studying the role of AS and to analyze the factors that promote it. The elaboration of AS judgments is a complex process that involves different variables. In this paper, a review is presented in order to display the individual contribution of every factor in Lent's AS model. The main purpose is to provide a summary of empirical investigations of the interrelation of the proposed factors, which will enable researchers to reach conclusions about the fit of the model. The collected evidence in this study justifies each of the assumptions made in Lent´s AS model. The meta-analysis is consistent with these findings.

Introduction

Attention to studying Academic Satisfaction (AS) has increased as researchers and educators recognized AS as a key variable to explain problems regarding academic performance, motivation and retention. Several studies point out that, on the one hand, AS is negatively related to delay at the beginning of a career, academic failure and stress during educational transitions, and dysfunctional behavior throughout the development of the career (Lounsbury et al., 2003; Tessema, Ready & Yu, 2012). On the other hand, AS is positively related to academic adjustment (Lent, Taveira, Sheu & Single, 2009), social integration (Suldo, Riley & Shaffer, 2008), persistence and retention (Fernandes Sisto et al., 2008; Kuo, Walker, Schroder, & Belland, 2014), academic success (Balkis, 2013; Suldo Riley & Shaffer 2006) and general life satisfaction (Lounsbury, Park, Sundstrom, Williamson, & Pemberton, 2004; Lent et al., 2014), among other factors.

Conceptual Delimitation

Despite the agreement between researchers about the significance of satisfaction judgments, there have been distinct controversies about its conceptual delimitation (Vittersø, Biswas-Diener & Diener, 2005). The most extended conceptualization in actual literature sees satisfaction as a cognitive evaluation that people make in order to compare their aspirations with their achievements (Diener, 1994). Such satisfaction judgments can be made considering life as a whole (satisfaction in life) or considering specific areas as job, family or career (Suldo et al., 2006), with AS as a specific type of satisfaction judgment. As pointed out by Lent, Singley, Sheu, Schmidt, and Schmidt (2007), there is another (parallel) conceptualization that defines AS as "the level of enjoyment that

students perceive when they carry out experiences linked to their role as students" (87). However, this definition is unsuitable since the positive affect would be a variable closely linked with satisfaction judgments, but different. The positive affect influences the conformation of satisfaction judgment (Schoefer, 2008) and may increase as a consequence of favorable evaluation (Tessema, Ready & Yu, 2012). This close link between positive affect and satisfaction judgments leads often to them being seen as interchangeable, when actually they are associated but are different variables. Therefore, AS must be understood as a *cognitive judgment* that refers to how positively students evaluate their learning experiences at the university (Kuo et al., 2014).

Academic Satisfaction and Academic Achievement

Academic achievement and persistence at school depends upon cognitive aptitude but also motivational variables are key factors to explain the causes of student success (Lent et al., 2014). Usually, the concept of motivation is used to refer to the drive or energy necessary to initiate and maintain a behavior. However, this concept involves the coordination of the person to activate and direct behavior towards a goal (Palmero, 2008). In other words, activation is only one component of motivation, while direction is another key to understanding motivated behavior.

Cognitive judgments, and in particular, satisfaction judgments are central in the process of directing behaviors. These judgments allow the organization to determine if it will continue to invest energy and resources in a particular behavior or goal or if it is convenient to redirect these resources and effort. Satisfaction judgments have a feedback function over goal choices and behaviors towards reaching them (Bradford, 2011). Thus, the students most satisfied with their studies will redirect their resources towards their academic activities, showing a greater involvement (Kong & Yan, 2014), while students with less AS will redirect their resources to activities that generate greater satisfaction. This can explain why AS is positively related to persistence and commitment (Tessema, et al., 2012) and inversely related to procrastination and the decision to dropout (Balkis, 2013; Kuo, et al., 2014).

Several investigations developed during the last decade concluded that is most likely that students with higher AS show more persistence and commitment to their studies, as well as academic achievement and, therefore, are more likelyy to successfully end their studies (DeShields, Kara & Kaynak, 2005; Pascarella & Terenzini, 2005; Simões, Matos, Tomé, Ferreira, & Chaínho, 2010; Tessema, et al., 2012). Students with lesser satisfaction tend to show greater tendencies to dropout, lesser efforts and more difficulties to develop actions that require regularity such as attending class and getting involved in activities demanded by their careers (Kuo et al., 2014; Özgüngör, 2010). Still, in order to define optimal academic behavior, it should be considered academic achievement but also psychological welfare of the student during the process of learning.

Academic Satisfaction, Health and Well-being

The contribution of Subjective Well-being (SW) on improving health has been widely demonstrated. In a review made by Diener and Chan (2011) 26 longitudinal studies conclude that SW is associated with longevity in health populations as in populations with diseases (e.g. AIDS, coronary diseases, with organ transplants, diabetics, among others). Additionally, 17 longitudinal studies concluded that people with higher SW have fewer possibilities to get a disease (mainly with small cardiovascular problems) and have greater probabilities to successfully recover from a disease or pain (e.g. fractures). It is important to mention three meta-analytic studies (Chida & Steptoe, 2008; Howell, Kern & Lyubomirsky, 2007; Lyubomirsky, King & Diener, 2005) that suggest that people with higher SW live longer, have fewer health problems and less risk of mortality, even when controlling the effect of variables associated with socioeconomic level or negative emotional states.

SW refers to a global evaluation that individuals make about their well-being. This construct has a cognitive component (vital satisfaction judgments) and an affective component (the balance between positive and negative emotions). This way, satisfaction judgments with life constitute a key component to understand and predict SW (Gamble & Gärling, 2012). Experimental and non-experimental studies suggest that vital satisfaction judgments are strongly associated with SW rates (r values =.50; Schimmack, 2008) and changes in satisfaction judgments generate meaningful changes in SW. At this point, AS judgments are important, because they are key components in vital satisfaction in university students (Lent, 2004; Lounsbury et al., 2004).

Many studies support the importance of AS above vital satisfaction judgments and SW. In a review conducted by Suldo et al. (2006) over a dozen investigations were found that indicate that feelings and attitudes of students towards school are positively associated with their levels of SW and satisfaction in life (r values around .34). Similar results have been reported in empirical studies with students from different cultures, for example North America (Lent et al., 2007), Portugal (Lent et al., 2009; Lent, do Céu Taveira, & Lobo, 2012), México (Ojeda, Flores & Navarro, 2011) and Africa (Lent et al., 2014). In all cases, a meaningful effect was observed between AS and vital satisfaction (β values between .12 y .37), even when the influence of positive affect is controlled. In a study of the Argentinian population, it verified the contribution of AS judgments over vital satisfaction and SW in university students (Medrano, 2012). Through a structural equation modelling investigation (N=326) it was verified that AS had a significant effect on vital satisfaction (direct effect β=.34) and SW (indirect effect β=.16). These effects where maintained when the influence of positive or negative affect was weighted. The model presented a good fit (χ^2=28.58, gl=7; CFI=.97; RMSEA=.069) and a similar explicative value to those obtained in previous studies (Lent et al., 2009; Lent, et al., 2012).

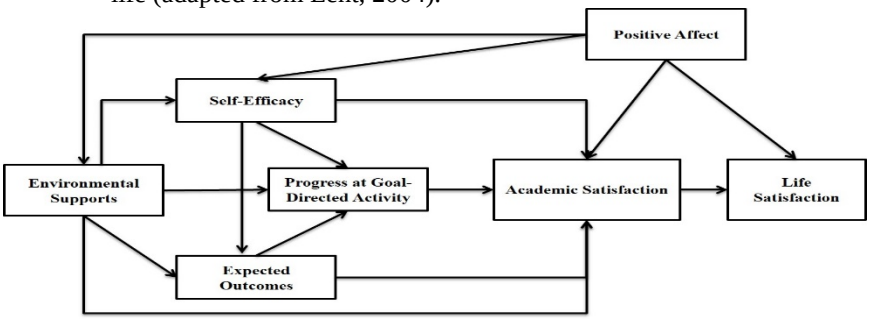
As pointed out by Suldo et al. (2006), educators & researchers must acknowledge that academic variables have a considerable impact on well-being and student health. It is essential to develop studies to determine the factors that promote well-being. This is a requisite to improve health promotion and optimal behavior in students. This is particularly important in students that are experiencing critical stages such as university entrance because vital transitions affect SW (Luhmann, Hofmann, Eid, & Lucas, 2012). AS judgments have been proved to be a factor that contributes not only to successful student achievement (Kuo, et al., 2014) but also in the development of their health and SW (Lent, et al., 2014; Medrano, 2012). Over all, actual research sustains the importance of studying the role of AS and analyzes the factors that promotes it.

Lent's Academic Satisfaction Model

The construction of AS judgments is a complex process that involves different variables. In an effort to systematize and articulate these variables, Lent (2004) proposes a theoretical model of *academic satisfaction*, which takes into account theoretical constructs of the Socio Cognitive Career Theory (SCCT; e.g. self-efficacy and outcome expectations) and from other theories of subjective well-being (positive affect, for example).

According to Lent's model (2004), general satisfaction in life is directly influenced by AS judgments. At the same time, AS is affected by student's goals, specifically goals progress perception: is more likely for people to be satisfied if they are actively involved and have achieved an effective progress in valued goals. On the other hand, to feel competent to achieve a task successfully (self-efficacy) and anticipate positive consequences (outcome expectations), makes it possible for people to actively get involved on achieving their goals. Finally, the environmental support can promote the development of efficacy beliefs, which generate the visualization of positive scenarios and consequences and provides resources that collaborate with the achievement of established goals. The AS model also integrates the role of positive affect (Lent, 2004), that influences the perception of environmental support, self-efficacy beliefs and AS judgments (see figure 1).

Figure 1. Social Cognitive Model of Academic Satisfaction and Satisfaction in life (adapted from Lent, 2004).



Purpose of the Research

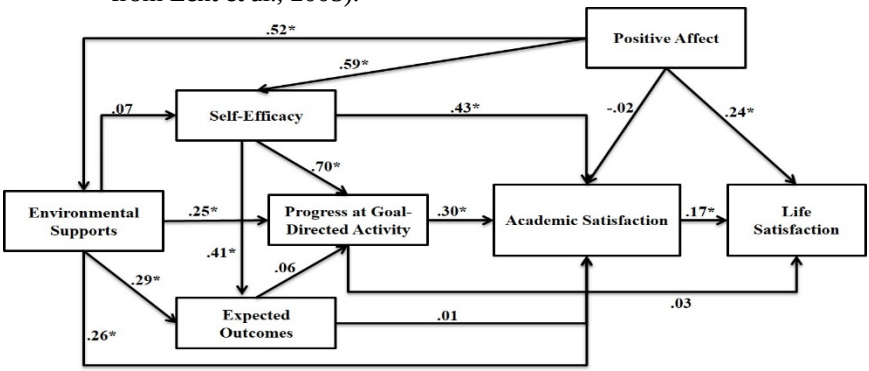
In this paper a review is presented in order to display the individual contribution of every factor in Lent's AS model (2004). The main purpose is to provide a summary of empirical investigations that evaluate the interrelation of the proposed factors, which enable investigators to reach conclusions about the adjustment (or not) of the model. In order to achieve this goal, studies conducted that have verified the appropriateness of the model using Structural Equation Analysis are reviewed and detailed. The importance of conducting a review and a meta-analytic approach lays on the recognition of the state of knowledge of the relations and/or the model of interest as to discern the aspects that need to be more researched (Cooper, 2010).

Empirical Evidence on Socio Cognitive Model of Academic Satisfaction

Since its initial formulation, the AS model (Lent, 2004), has been empirically examined in several opportunities. The investigation examined and evaluated Lent´s model (Lent et al., 2005) contribution over vital satisfaction using a nomothetic (study 1; *N*=177) and ideographic approach (study 2, *N*=299). Even though both studies started from the model proposed by Lent (2004), in the first, participants reported their levels of progress and perceived satisfaction in a predefined domain (e.g., academic), while the second model also considered the importance that each student gave to the specific domain. Using this strategy, the authors pretended to determine if the assigned value to a goal moderates the effect over satisfaction.

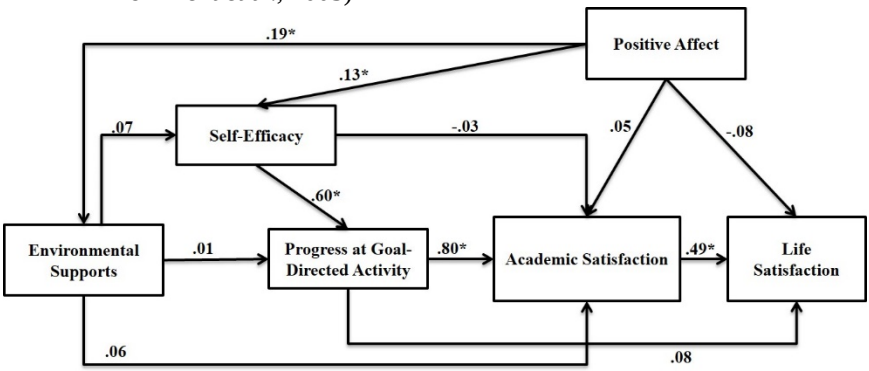
Both models presented a good fit (Table 1). In the first study (nomothetic measures) the explanatory power was verified in every variable, some theoretical discrepancies were observed in some cases (Figure 2). The positive affect showed significant effect over support perception, self-efficacy and vital satisfaction, but did not show a direct effect over AS. Perceived support, verified its contribution to goal progress, outcome expectations and AS, but noticeably it was not obtained a significant effect over self-efficacy. Moreover, self-efficacy showed a significant effect over outcome expectations, goal progress and AS. Outcome expectations did not present a significant effect and goal progress showed a direct contribution over AS but not over vital satisfaction. AS proved to contribute significantly in vital satisfaction prediction.

Figure 2. Standardized β scores of AS model with nomologic scores (adapted from Lent et al., 2005).



In the second study (ideographic measures), two substantial differences where observed: an improvement in the predictive power of goal progress over AS and in the predictive power of AS over vital satisfaction were obtained. Nevertheless, the effect of the other variables is diminished (Figure 3). In addition, the authors observed that measures remain invariant when comparing the most important domains with those less important. Their conclusion is that the value given to the goals only has a moderate effect. It is noticed that in this study was not examined the role of outcome expectations because they didn´t showed a significant contribution in the model of the study 1.

Figure 3. Standardized β scores of AS model with ideographic scores (adapted from Lent et al., 2005)

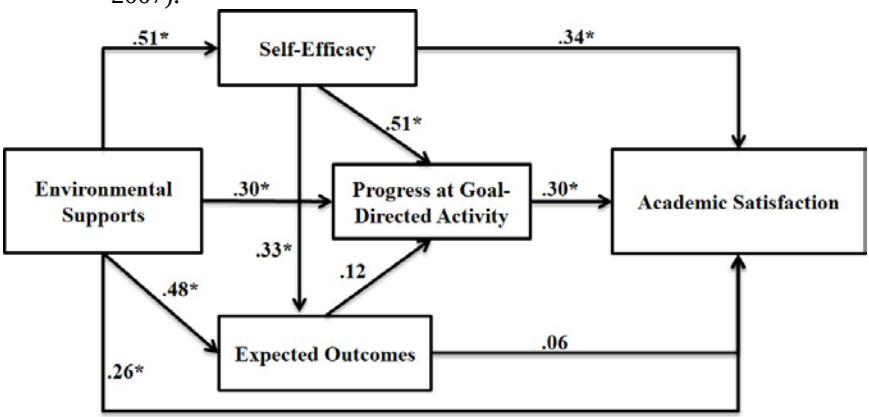


Based on these previous studies, a new research was developed in which 153 engineering students took part (Lent et al., 2007). In this opportunity, the study was focused in SCCT central variables (self-efficacy, outcome expectations, progress in goals and perceived support), without considering positive affect in the analysis. By using path analysis (Figure 4), it was verified that students that inform higher levels in AS perceive that they are achieving progress in their goals,

have strong beliefs about their academics abilities and perceive an adequate support to achieve educational goals (Lent et al., 2007). The only variable of this model that didn´t showed a significant influence over AS was outcome expectations. However, the authors suggested that the instrument used could not properly represent the expectations that engineering students have.

The results of this study also allowed to verify that self-efficacy beliefs and perceived support indirectly influence AS through the perception of progress in goals. In addition, perceived support constitutes a source of self-efficacy and results expectations, which is also influenced by self-efficacy beliefs. The model presented a satisfactory fit (Table 1) and a considerable explanatory value of AS (R^2 = 68%).

Figure 4. Standardized β coefficients of AS model (adapted from Lent et al., 2007).

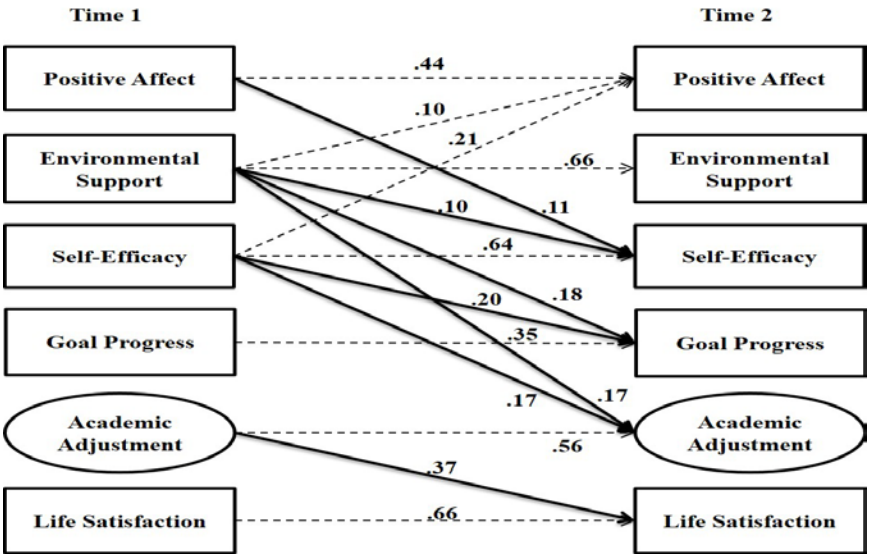


Despite the contributions of this work, it has methodological limitations. First, the sample was relatively small (N=153) and homogeneous, because only engineering students participated. These factors could affect the stability of the structural equations model and, in consequence, its utility (Weston & Gore, 2006). Second, the model doesn't include positive affect measures, as the theoretical model suggests (Lent, 2004; Lent & Brown, 2008).

In another study with Portuguese students (Lent et al., 2009) the AS model was verified using a longitudinal design (15 weeks) with the purpose of exploring the temporal relations between the variables and to verify if they were correctly formulated according to Lent's model (2004). For that purpose, two times measures were made to verified if measures made in time one have a significant contribution to explain measures made in time two (Figure 5). Thus, the plausibility of temporary hypothesis made in the model were examined. A significant point in this study is that it didn´t consider the role of outcome expectations but also that took into consideration three measures to evaluate

academic adjustment (academic satisfaction, stress and academic adjustment) and not AS as in previous studies.

Figure 5. Standardized β coefficients of AS model with longitudinal measures (adapted from Lent et al, 2009).



The two times model showed satisfactory fit indexes (CFI=.97; RMSEA=0.06) although not all hypothesized relations shown statistically significant values. In Figure 5 only the significant effects observed are included. As it can be seen, the contribution of positive affect over self-efficacy is confirmed, but not over perceived support and academic adjustment. The contribution of perceived support over self-efficacy, goal progress and AS (assessed as a component of academic adjustment) is verified. Furthermore, self-efficacy contributes significantly in goal progress and academic adjustment. Contrary to the expected, goal progress didn´t show a significant relation with AS as vital satisfaction. Finally, only academic adjustment contributed significantly on satisfaction in life judgments.

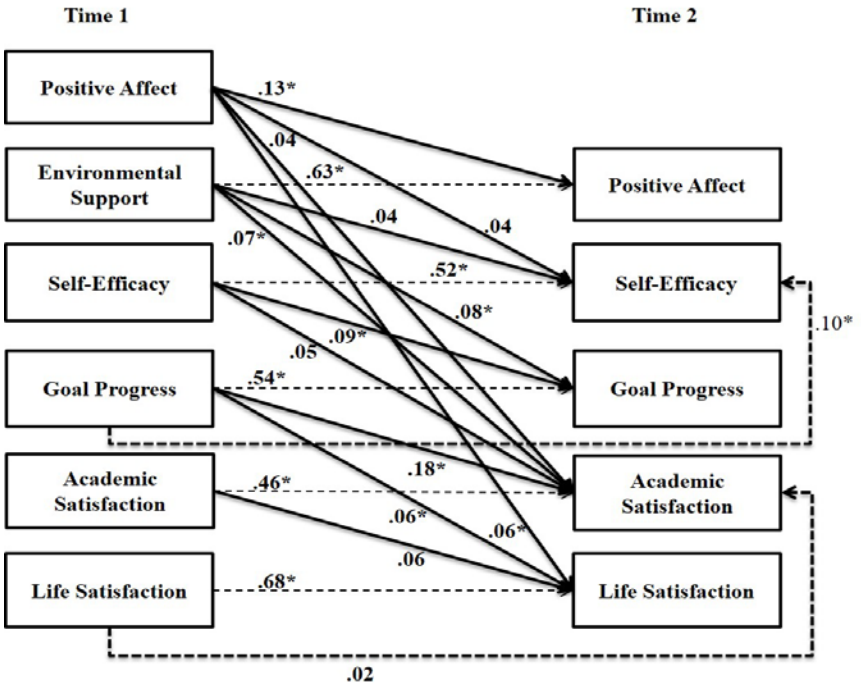
Although most of the effects are coherent with the base model, positive affect and goal progress do not present a different behavior than expected. According to this, the authors suggest that positive affect could have an indirect contribution over AS and it should be examined the way goal progress has been operationalized.

Regarding to the relation to the bi-directional effects, only two of them where verified: Self-efficacy/positive affect and perceived support/positive affect. The authors conclude that additional studies are needed to evaluate if the absence of

bi-directional effects in the remaining variables are due to problems in measurement or if more specifications to the original model are needed.

According to Single, Lent and Sheu (2010), these investigators developed a longitudinal study similar to the previous, but in this case, they considered two measures of the same variables with an eight-week interval between them. Unlike the previous work (Lent et al., 2009) only one measure of AS was taken. Fit indexes showed acceptable values but not optimal (Table 1). Among the most interesting results, it is noted that self-efficacy didn´t have a direct effect over AS, neither did positive affect over self-efficacy and AS (Figure 6). In addition, the authors observed that, when removing the reciprocal effects between self-efficacy and goal progress; and between AS and vital satisfaction, slightly improves the model fit. These results confirm the hypothesized behavior for every variable. However, the β values are lower than expected. It is important to highlight that data was obtained online and an important attrition was observed in the group of participants between the two measures. In fact, only 14% of 9000 initial participants answered the measures in time 1, while only 64% completed the measures in time 2. It is very likely that reported results are biased when a differential loss of participants is observed.

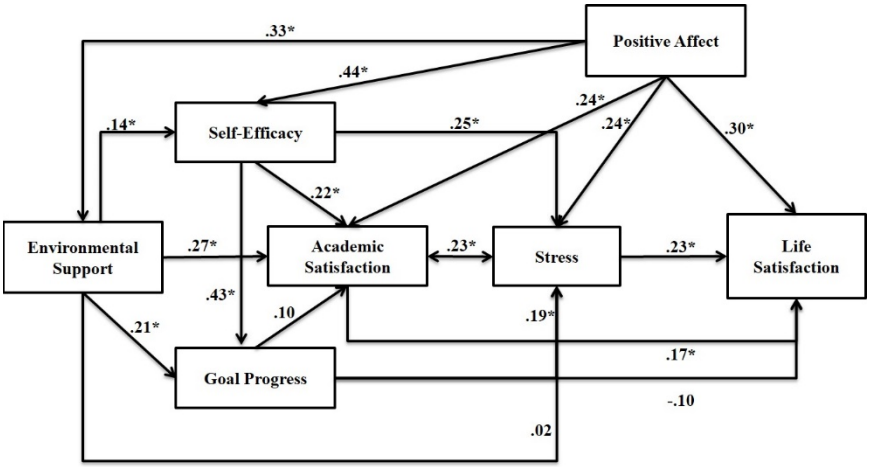
Figure 6. Standardized β coefficients of AS model with longitudinal measures (adapted from Single, Lent & Sheu, 2010).



These previous investigations were replicated by Lent et al. (2012) in a Portuguese student sample. Two studies were conducted: in the first one, the Lent´s (2004) model fit is evaluated and in the second one the longitudinal model assessed by Single, Lent & Sheu (2010) and Lent et al. (2009) is tested. Contrary to previous studies, stress is included as an independent variable but related to AS and vital satisfaction.

The first study verifies all the relations proposed by Lent (2004). Positive affect influences support perceptions, self-efficacy, AS judgments, vital satisfaction and stress in students. Similarly, support perceptions contributes on self-efficacy, goal progress and AS, although doesn't influences over stress. Self-efficacy beliefs predicts goal progress, AS and stress in a significant way, while goal progress only contributes in the prediction of perceived stress. Finally, AS, stress and vital satisfaction have significant relations between them (Figure 7).

Figure 7. Standardized β coefficients of AS model (adapted from Lent, et al., 2012).



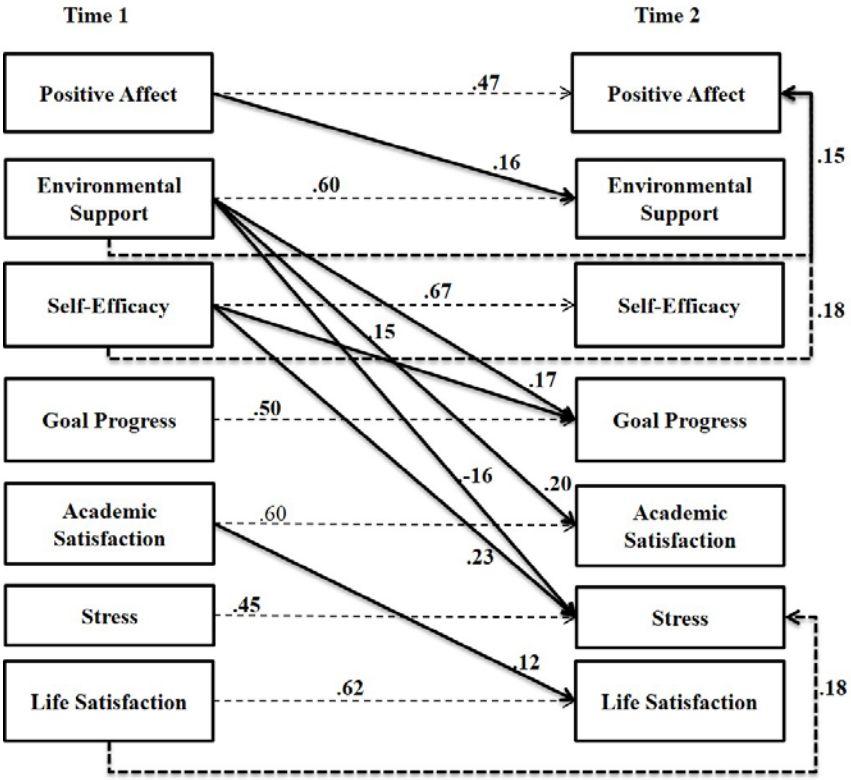
The model presents an acceptable adjustment to CFI index (.94) and SRMR (.05) but a poor adjustment in RMSEA index (.16). The authors argue that the inclusion of a path between positive affect and goal progress improves the adjustment of the model (CFI =.99; SRMR=.02; RMSEA =.10), although the RMSEA values remain inadequate.

In the second study, a longitudinal strategy was used, with a 15-week interval (Figure 8). Despite the acceptable model fit (Table 1), the variables behavior partially proved Lent's hypothesis (2004). It was demonstrated that positive affect (T1) influence perceived support (T2) and goal progress (T2) is predicted by self-efficacy (T1) and perceived support (T1). Correspondingly, perceived support (T1) has an effect on AS (T2) and AS explains vital satisfaction (T2). Finally, it is verified the contribution of self-efficacy (T1) over stress (T2). However, many

of the previous hypothesis where not confirmed because the measures of positive affect (T1) couldn't predict self-efficacy, AS, stress and vital satisfaction scores in time 2. Likewise goal progress (T1) and self-efficacy (T1) cannot explain AS (T2).

Based on these results, the authors argued that the AS and vital satisfaction model has some paths that are more strong and stable than others. This would be the case of positive affect over perceived support, the influence of self-efficacy and perceived support on goal progress and, finally, AS over vital satisfaction (Figure 8).

Figure 8. Standardized β coefficients of AS model with longitudinal measures (adapted from Lent, et al., 2012).



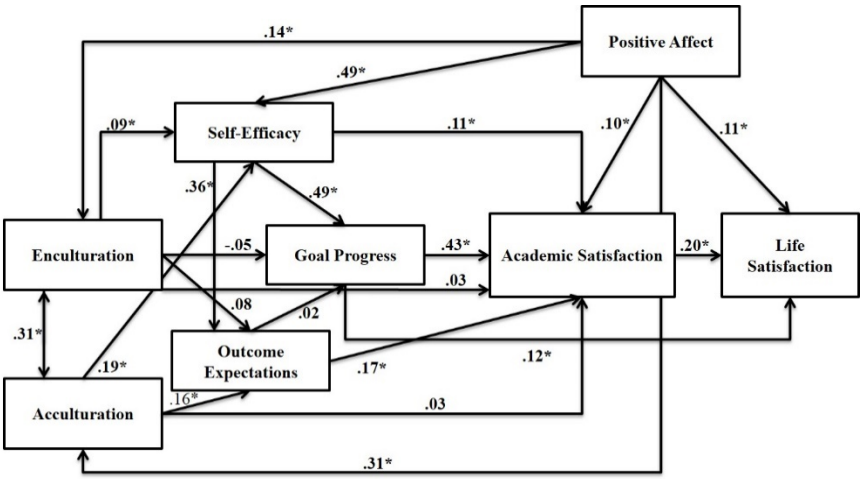
The AS model has been verified also in Mexican students. In a study carried out by Ojeda et al. (2011), the adjustment of the model was evaluated in a 457 sample of Mexican students that attended an American university. Besides this purpose, they had, as an additional goal, the evaluation of the acculturation and endoculturation, considering that these variables could work out as a particular

factors of the environment that could promote or block the development of AS and vital satisfaction in people that studied abroad.

The examined model presented satisfactory fit indexes (Table 1) and the variables showed a coherent functioning according to Lent's model (2004). In fact, the direct contribution of positive affect over self-efficacy, AS and vital satisfaction, as well as over endoculturation and acculturation, both variables considered as supporting/blocking factors of the environment. Self-efficacy beliefs contributes significantly to explain outcome expectations, goal progress and AS. Unlike previous research, outcome expectations present a significant effect over AS, despite the contribution of goal progress is not verified. Finally, the effect of goal progress on AS and AS over vital satisfaction is verified (Figure 9).

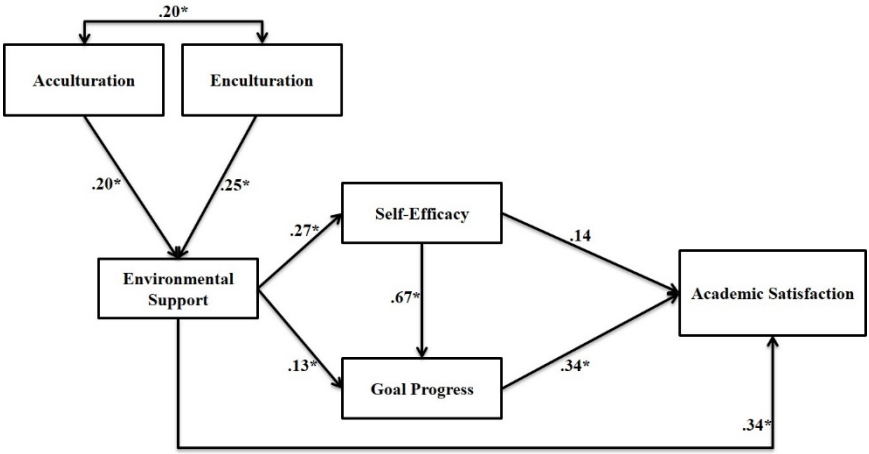
On the other hand, the authors had the additional aim to verify if endoculturation and acculturation as environment resources could affect AS and vital satisfaction in foreign students. In general, Lent's hypothesis of the importance of positive relations with the values and culture of the native people (endoculturation) and different cultures (acculturation) where verified. Still, the observed effects where minor and are centered in self-efficacy beliefs.

Figure 9. Standardized β coefficients of AS model (adapted from Ojeda, et al., 2011).



Hui, Lent and Miller (2013) also analyzed the contribution of acculturation and endoculturation in AS model with an Asian students sample that attended American universities. The adjustment of the model was optimal Table 1) and all the relations were confirmed except the link between self-efficacy and AS. Thereby, evidence shows that self-efficacy influences AS indirectly through goal progress (Figure 10). Both acculturation and endoculturation have an indirect effect on AS through perceived support.

Figure 10. Standardized β coefficients of AS model (adapted from Hui, et al., 2013).



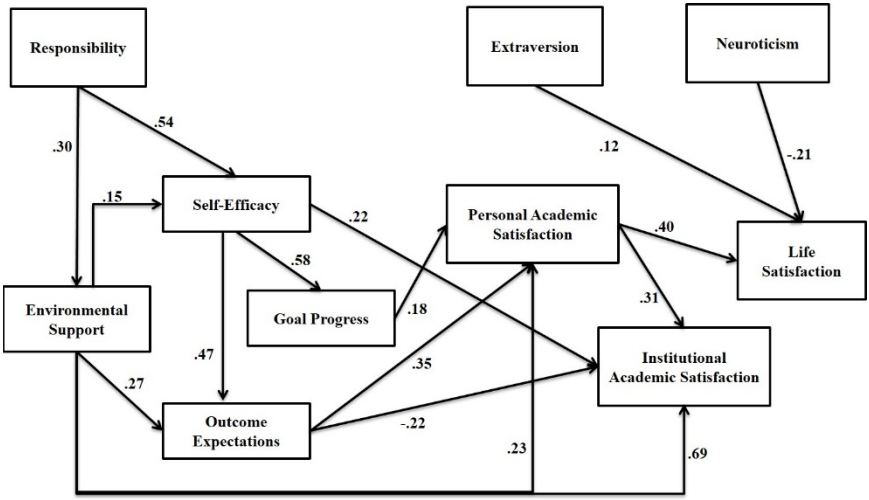
Feldt (2012) also studied Lent's Model (2004) in a sample of 270 psychology students. Unlike previous studies, the author divided AS judgments in two dimensions: 1) personal academic satisfaction and institution satisfaction. He also wanted to study personality features and their possible contribution to AS model. Features of responsibility, extraversion and neuroticism where included from the Big Five Factors Model.

Feldt's Model (2012) didn't showed a satisfactory model fit (Table 1) due to low indexes below the cut point suggested by the literature (CFI=.83). Additionally, extraversion and neuroticism were not significant over AS variables; they only contributed to vital satisfaction judgments. In addition, responsibility showed a significant influence over support perception and self-efficacy, but not over the other variables (Figure 11).

SCCT variables presented a similar behavior to Lent's Model (2004), but had some particularities: Self-efficacy had a significant effect over institutional AS, but not over personal. Outcome expectations had a significant effect on AS although it's direction was positive on personal AS and negative on institutional AS. Outcome expectations did not have a significant effect on goal progress. Another interesting result was that perceived support did not have an effect on goal progress as in previous studies. Finally, personal AS was observed to influence vital satisfaction.

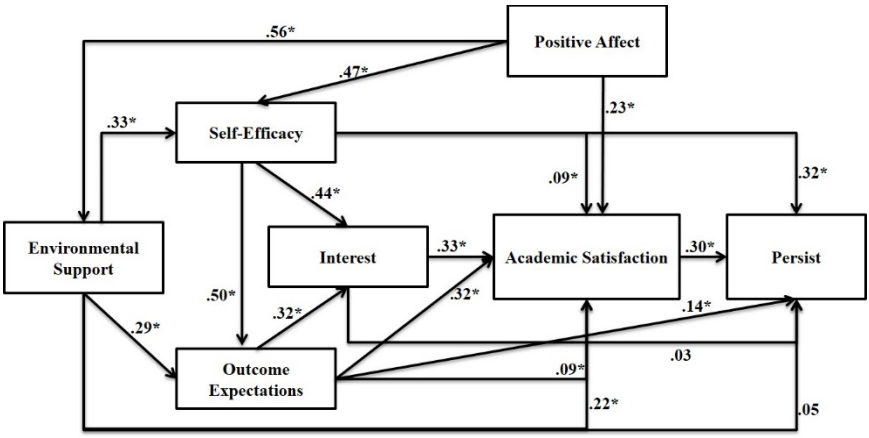
Feldt (2012) concludes that, in general, the study does not provide the necessary evidence in favor to include personality features in AS model. Beyond certain differences in the behavior of some variables, the contribution of perceived support, self-efficacy, outcome expectations and goal progress in AS judgment is verified.

Figure 11. Standardized β coefficients of AS model (adapted from Feldt, 2012).



More recently, Lent et al. (2013) try to articulate in one holistic model the SCCT models of interest and election and AS model. Working with the standard AS model, they remove goal progress as a variable and include interest and persistence (see Figure 12). This way, it can be explored the relation between interest, satisfaction and persistence: more specifically, the authors propose that AS mediate interest and academic persistence. As an additional objective, multi-group analysis were performed to determine the invariability of the model according to sex and race.

Figure 12. Standardized β coefficients of AS model, Interest and Persistence (adapted from Lent et al., 2013).



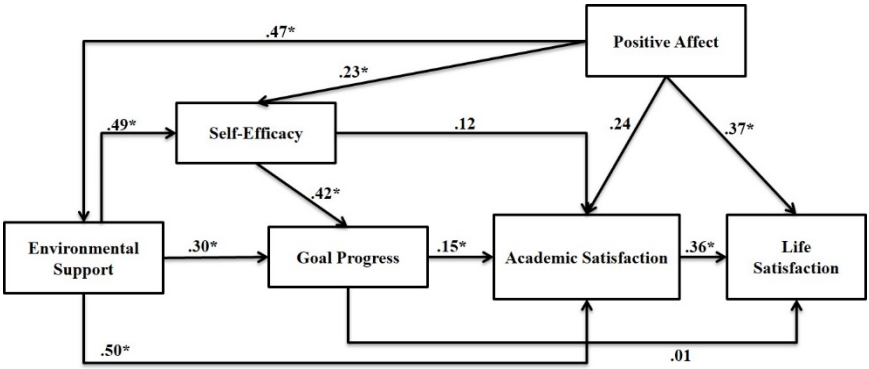
These results indicate that the model has a satisfactory adjustment (Table 2) and the interrelation between the variables is coherent with the theoretical model. Only two paths where not significant: perceived support / persistence and interest / persistence. Only AS and self-efficacy had a direct effect over persistence. Another remarkable aspect is that outcome expectations presented a significant contribution to the model, affecting interests, AS and persistence. The change in the behavior of this variable is attributed to modifications of the operationalization of the construct. As pointed out by the authors, new questions where added to include two dimensions of outcome expectations: a) intrinsic expectations and b) extrinsic expectations. It was observed that previous studies were centered mainly in extrinsic expectations misrepresenting intrinsic expectations. Because intrinsic expectations have more importance in the conformations of AS judgments, the modification in the scale has raised the predictive power of outcome expectations.

Noteworthy, outcome expectations have a poorly direct effect on AS, but mainly an indirect contribution is observed. The data obtained of this and previous studies (Hui et al., 2013; Lent et al., 2012) allow to hypothesize that the effect of self-efficacy over AS is through outcome expectations and goal progress. Finally, the metrical and structural invariance of the model was verify considering sex and race of the examinees. Apparently, these socio-demographic variables do not alter the variables under study.

AS model and vital satisfaction model were examined again by Lent et al. (2014) in an Angolan and Mozambican university students sample (N=241 and N=425 respectively). In previous studies, it was analyzed if the model was invariant according to sex and nationality. The authors eliminated outcome expectations due to its small contribution to the model (Lent et al., 2005, 2007).

The model showed an optimal fit (see Table 1) and the variables had similar results to those reported in previous studies (Figure 13). In this study it is detected that self-efficacy does not have a direct effect on AS, which reinforces Lent´s et al. (2013) hypothesis of an indirect effect through goal progress and outcome expectations. It is also observed that goal progress only affects AS and not vital satisfaction. The positive affect influences support perception, goal progress and AS is verified. The model also proved to be invariant considering sex and nationality.

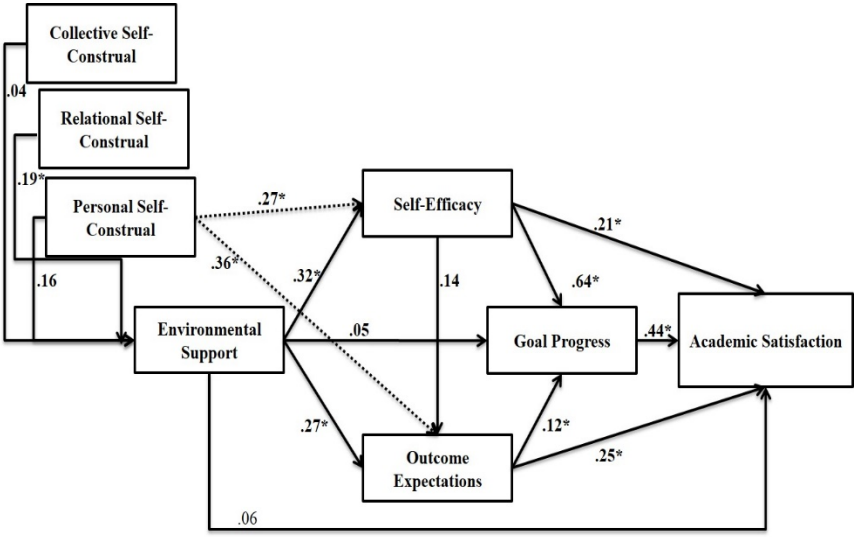
Figure 13. Standardized β coefficients of AS model (adapted from Lent et al., 2014).



In recent years, some studies have examined the contribution of "Self-Construal" in AS model. Sheu, Chong, Chen, and Lin, (2014) have done it with a Taiwanese and Singaporean students sample and Ezeofor and Lent (2014) with African students sample. This concept refers to the place that other people have in shaping our own thoughts. According to Ezeofor and Lent (2014), this variable could affect AS through the perception of environmental support. It arises that people can develop a vision of themselves more independent and autonomous from others (independent constructions of self-concept) or, on the contrary, a vision of themselves defined by the relation between others (relational construction of self-concept) or it can have more meaning the goals or values of the community that the person belongs. According to Ezeofor and Lent (2014), this variable can be considered more important in collectivistic cultures, as African culture.

The model shows an acceptable adjustment (see Table 1) and the relational vision of self-concept has a significant effect through support perceptions; however, it has a low contribution (Figure 14). The remaining variables of the model have a similar behavior as reported in previous studies. Analyzing the modification indexes, the authors re-specified the model by adding a new path between de independent vision of the self-concept and outcome expectations (Ezeofor & Lent, 2014). Authors argued that while support perception is a factor linked to socio-cultural factors, self-efficacy and outcome expectations are more independent variables.

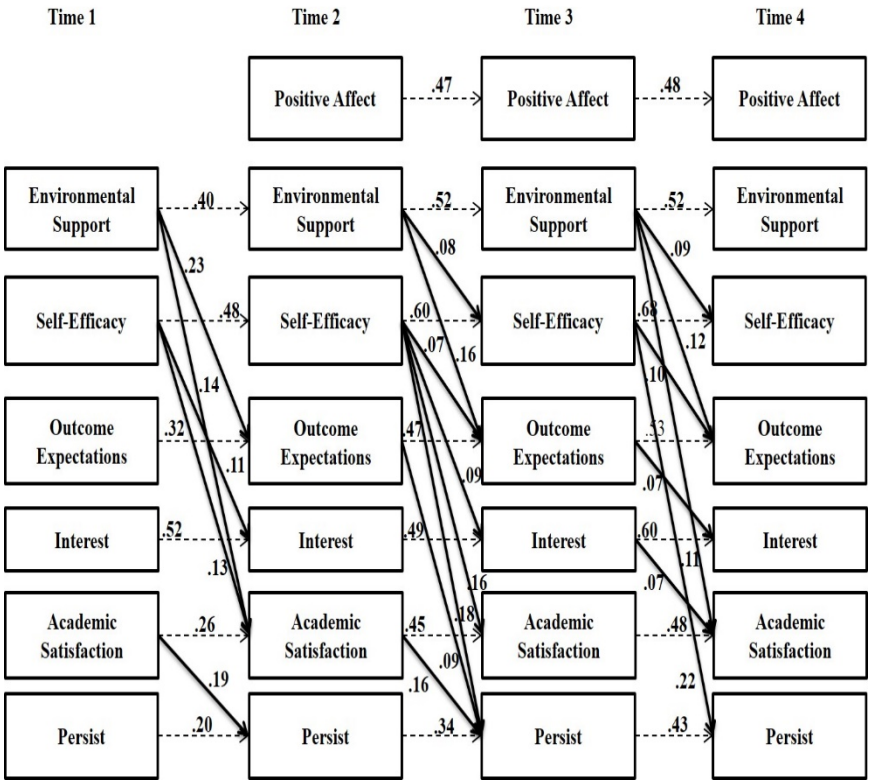
Figure 14. Standardized β coefficients of AS model (adapted from Ezeofor & Lent, 2014).



According to the investigation of Ezeofor and Lent (2014), most of the variables of the AS model presented an adequate fit to Lent´s model (2004), perceived support did not contribute directly to goal progress neither to AS. Self-efficacy, noteworthy, does not affect outcome expectations but did affect AS. The path between self-efficacy and AS becomes confusing due to the arguments presented in previous studies of the lack of a direct effect between these variables.

In their last work, Lent et al. (2015) work with the same sample of 1377 students used in their study of 2013 and develops a longitudinal two-year study (one measurement each semester). In the 2015 study, they try to test the holistic model that includes interests, satisfaction and persistence. Navarro, Flores, Lee and González (2014) developed the same study considering Lent's (2013) measures and adding second semester measures. By adding two more measures (third and fourth semester), Lent et al. (2015) tested a four-time model (Figure 15).

Figure 15. Standardized β coefficients of AS model with longitudinal measures (adapted from Navarro et al., 2014 and Lent et al., 2015).



It was observed, in general, that the integrative model of interests, satisfaction and persistence presents a good adjustment (Table 1). Despite the optimal adjustment of the model, the effect size measures estimated were weaker than those reported in previous studies. The authors argued that it is likely to expect this decrease when working with a longitudinal design.

The behavior of the variables is coherent to the previous studied models of AS. Perceived support is a significant predictor of self-efficacy, and both variables have an effect on outcome expectations. It is also verified the contribution of self-efficacy on interests and there is only partial direct contribution over AS. The observed effect is, however, low and tends to diminish when the goal progress model is included (Lent et al., 2013; Lent et al., 2014). The contribution of positive affect it is not verified, reason why the authors conclude that the influence of this variable occurs under certain circumstances, e.g. High emotional activation (Lent et al., 2015). Finally, as the authors hypothesized, the contribution of AS over persistence is partially verified.

Table 1. *Sampling characteristics and adjustment indexes of the different studies that evaluated AS Model.*

	Population	Sample	Adjustment indexes	
			CFI	RMSEA
Lent et al., 2005 (study 1)	American	*N*=177 (105w; 72m)	.95	.04
Lent et al., 2005 (study 2)	American	*N*=299 (185w; 114m)	.99	.02
Lent et al., 2007	American	*N*=153 students (124m; 21w; 8 not specified)	.96	.06
Lent et al., 2009	Portuguese	*N*=252 (217w; 35m)	.97	.06
Single, Lent & Sheu, 2010	American	*N*=769 (500w; 269m)	.97	.09
Lent, Taveira & Lobos, 2012 (study 1)	Portuguese	*N*=366 (94w; 271m; 1 not specified)	.99	.10
Lent, Taveira & Lobos, 2012 (study 2)	Portuguese	*N*=158 (91w; 67m)	.99	.07
Ojeda, Flores & Navarro, 2011	Mexican	*N*=457 (265w; 192m)	.92	.08
Fledt, 2012	American	*N*=270 (196w; 69m)	.83	.06
Lent et al., 2013	American	*N*=1337 (456w; 918m)	.95	.05
Hui, Lent y Miller, 2013	Asian	*N*=122 (68w; 50m; 4 not specified)	1	0
Lent et al., 2014	African	*N*= 666 (250w; 416m)	.99	.02
Ezeofor & Lent, 2014	African	*N*=174 (sex distribution not reported)	.99	0
Navarro et al., 2014	American	*N*=550 (166w; 384m)	1	0
Lent et al., 2015	American	*N*=732 (268w; 464m)	.92	.07

Empirical Evidence: Contribution of every factor in Lent's model of AS. A Meta-Analysis Approach

Quantitative analysis was based in standardized β scores taken as correlations for the meta-analysis, because most of the studies used didn´t report a correlation matrix. Although this procedure is controverted, Peterson and Brown (2005)

points out that there is a strong relation between *r* scores and *β*. Indeed, the observed correlation by these authors were .84, which is equivalent to R^2=.70.

In order to make the analysis, it was used Comprehensive Meta-Analysis 3.3.070 software. It was used in the following functions (Table 2):

Table 2. *Statistics formula applied*

Fisher's Z transformation	Correlation
FisherZ = 0.5 * Log((1 + Corr) / (1 - Corr))	Corr = Given
FisherZSE = 1 / (Sqr(N - 3))	CorrSE = (1 - Corr ^ 2) * FisherZSE
FisherZ = 0.5 * Log((1 + 0,560) / (1 - 0,560)) = 0,633	Corr = 0,560
FisherZSE = 1 / (Sqr(1377 - 3)) = 0,027	CorrSE = (1 - 0,560 ^ 2) * 0,027 = 0,019

Note. Starting with Correlation and Sample size.

Below, the results of the meta-analysis is presented (Table 3). These results are synthesized in figure 16.

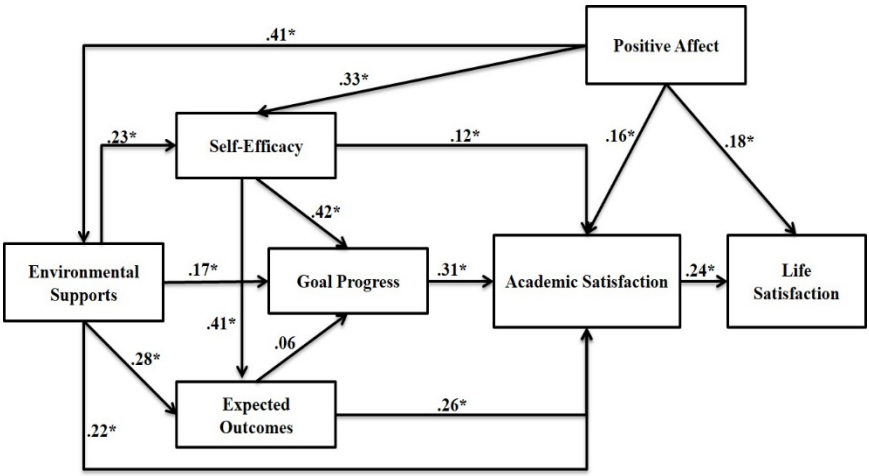
Table 3. *Meta-analysis of the interrelations between variables of Socio Cognitive Model of Academic Satisfaction*

	Statistics					
Interrelations	Correlation	Lower limit	Upper limit	*Z*	*p*	*N*
Positive Affect/Academic Satisfaction	0,241	0,208	0,273	13,756	0,000	8
Positive Affect/Self-efficacy	0,330	0,303	0,356	22,554	0,000	8
Positive Affect/Vital Satisfaction	0,177	0,140	0,213	9,304	0,000	6
Positive Affect/Perceived support	0,412	0,384	0,438	26,400	0,000	6
Satifacción A./Vital Satisfaction	0,241	0,208	0,273	13,756	0,000	8
Self-efficacy/Academic Satisfaction	0,122	0,096	0,149	8,913	0,000	11
Self-efficacy/Goal Progress	0,416	0,389	0,442	27,378	0,000	12
Self-efficacy/Outcome expectations	0,364	0,334	0,393	21,949	0,000	7
Perceived support/Self-efficacy	0,229	0,203	0,254	16,986	0,000	12
Perceived support/Goal Progress	0,170	0,136	0,204	9,579	0,000	10

Perceived support/Outcome expectations	0,283	0,249	0,316	15,555	0,000	6
Perceived support/Academic Satisfaction	0,223	0,197	0,249	16,402	0,000	12
Outcome expectations/Academic Satisfaction	0,061	-0,002	0,124	1,891	0,059	4
Outcome expectations/Academic Satisfaction	0,259	0,222	0,294	13,472	0,000	6
Goal Progress/Academic Satisfaction	0,306	0,275	0,336	18,490	0,000	10

Note: N = number of considered studies.

Figure 16. Paths proposed by Lent (2004). Synthesized β scores.



As shown in Figure 16 and Table 3, all the paths proposed in the Socio-Cognitive model of academic satisfaction (Lent 2004) are meaningful, except the relation between outcome expectations and goal progress.

Discussion

Together, the collected evidence justifies each of the assumptions made in Lent's (2004) AS model. Every path of the AS model are theoretically and empirically based, although it is not enough to evaluate the bivariate effect of these paths to conclude that Lent's (2004) model it is correct. Multivariate studies must be carried out in order to allow the joint examination of the different variables of the model, analyzing the adjustment to the data. These studies so far demonstrate that the model has a satisfactory adjustment, and in most of the cases

presents an optimal adjustment (CFI values>.95). The meta-analysis is consistent with these arguments, when proved of the significant effect of the variables of the model (except the path between outcome expectations and goal progress).

According to the review, it can be concluded:

1. AS model (in their different variants) has an optimal adjustment (Tables 2 and 3) being a plausible model, theoretically based and with important empirical evidence.
2. Positive Affect is a variable that influences directly and indirectly AS through perceived support and self-efficacy beliefs. However, it most notorious effect is with high emotional activation.
3. Perceived support has a direct effect on self-efficacy, outcome expectations, goal progress and AS.
4. Self-efficacy beliefs affect outcome expectations and have an indirect effect on AS through the perception of goal progress.
5. Outcome expectations have a direct effect on AS judgments. Despite this, the meta-analysis suggests that more evidence is needed with regard the relationship between outcome expectations and academic goal progress. This is particularly important when considering that the studied models have found an adequate adjustment and in this meta-analysis the relation is not significant (p=.059).
6. Goal progress have a direct effect on AS and moderates the effect of the other variables (especially self-efficacy) on AS.

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