Openness and Ambiguity Intolerance: Their Differential Relations

to Well-Being in the Context of an Academic Life Transition

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Abstract

Despite previous suggestions that ambiguity intolerance is part of openness, the current study demonstrates important differences between these traits in the context of an academic life transition. Openness was expected to be related to well-being through challenge and threat appraisals in the beginning of the university studies due to its relevance to novelty and intellect. It was expected to be related to well-being later in the university studies due to its relevance to intellect. In contrast, ambiguity intolerance was expected to be related to well-being through challenge and threat appraisals only in the beginning of the university studies. Multigroup path analyses supported the hypotheses, comparing students in the beginning of the first year of university with advanced students. In the beginning of the university studies, the relations of openness and ambiguity intolerance to well-being were mediated by challenge and threat appraisals. The relationship of openness to well-being remained the same for advanced students, whereas the relationship of ambiguity intolerance to well-being, challenge and threat appraisals was reduced to non-significance. The findings contribute to our understanding of context-specific functions of traits, and more broadly to knowledge on person-environment fit and to understanding person-situation interactions.

KEYWORDS: Well-being; personality traits; openness; ambiguity intolerance; challenge and threat appraisals; life transitions; adjustment.

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Introduction

The trait ambiguity intolerance (also termed ambiguity tolerance or uncertainty tolerance/intolerance) is defined as "The tendency to perceive ambiguous situations as sources of threat." (Budner, 1962, p.39; see also Furnham, 1994; Furnham & Ribchester, 1995). The trait openness may be defined as a broad, deep, original, and complex mental and experiential life (John & Srivastava, 1999). McCrae (1996) suggested that ambiguity intolerance represents a motivational aspect of openness. Indeed, the two traits have clear similarities to one another. In particular, both contrast preference for the familiar with openness to novelty. However, unlike ambiguity intolerance, openness is also related to intellectual interest (see McCrae & Costa, 1997; Ostendorf & Angleitner, 1994). Therefore, they may have similar implications in situations that encompass novelty and change, but different implications in situations that focus on academic activities.

Drawing on person-environment fit theories, Emmons, Diener, and Larsen (1986) suggested that people would experience temporary positive affect in situations that are congruent with their traits. They indeed found that some traits were related to better mood in situations that were congruent with these traits. This pattern of findings may be extended to more stable life situations and their relation to well-being. Therefore, we suggest that openness and ambiguity intolerance would be related to well-being in life situations that are congruent with these traits.

Yet before addressing the expected relations between these traits and well-being in certain contexts, it is important to take into consideration the base-line relations of these traits to well-being. Recent meta analyses have found that openness to experience is typically not related

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to life satisfaction (DeNeve & Cooper, 1998; Heller, Watson, & Ilies, 2004; Steel, Schmidt, & Shultz, 2008). Furthermore, openness was not related to reactions to stressful situations (e.g., Suls, Martin, & David, 1998), and it showed complex relations to changes in well-being in the adjustment to a life transition (see Bardi & Ryff, 2007). Similarly to openness, ambiguity intolerance was found to be unrelated to well-being (as measured by depression) during mundane everyday life (Andersen & Schwartz, 1992). Yet in the context of adjustment to new life situations, ambiguity intolerance had maladaptive effects in the adjustment of teachers who were transferred to a new school (Friedel, & Dalbert, 2003). Because openness and ambiguity intolerance are not inherently related to well-being they are particularly interesting traits for examining context-specific relations to well-being.

What situations are likely to be congruent with openness and thus conducive to high subjective well-being? McCrae (1996) has argued that individuals high on openness are characterized by a need for variety, and may be motivated to actively seek out the unfamiliar. He indeed found evidence suggesting that individuals high on openness are more likely to welcome challenge and change (McCrae & Costa, 1985). This is in contrast to individuals low on openness, who are more conservative and prefer the familiar over the novel. Therefore, the beginning of a life transition with the novelty and unfamiliarity that it entails may be enjoyable for individuals high on openness in comparison with individuals low on openness. As a result, during the beginning of a life transition, individuals high on openness may experience high subjective well-being compared with those who are low on openness. Later on in the life transition openness might not be relevant to well-being anymore, unless other aspects of openness are relevant to the new life situation. In the context of the transition to university studies openness may continue to be relevant to well-being because of its relevance to intellect.

Specifically, individuals high on openness are interested in intellectual activities and as university studies provide such activities, this is likely to be an environment congruent with the trait of openness. Therefore, we expect that openness would be important for well-being also for more advanced students.

How is ambiguity tolerance likely to relate to well-being in the context of an academic life transition? The beginning of a life transition is a novel and thus ambiguous situation, as it is not clear yet how one ought to behave. Therefore, it should be a particularly difficult situation for individuals high on ambiguity intolerance, and it is likely to result with poor well-being. Indeed, several studies have found that ambiguity intolerance was associated with difficulties in coping with change (e.g., Judge, Thoresen, Pucik, & Wellbourne, 1999; Rush, Schoel, & Barnard, 1995). However, when the novelty wears off ambiguity intolerance might not be important for well-being anymore. Therefore we expect that ambiguity intolerance would be related to well-being in the beginning of university studies but not later on.

What might be the process that links openness and ambiguity intolerance to subjective well-being in the beginning of a life transition? Research shows that interpretations can mediate the ways in which stressful life events are experienced (e.g., Bauer & Bonanno, 2001; Davis, Lehman, Wortman, Silver, & Thompson, 1995; Peterson & Seligman, 1987). Indeed, appraisals mediated the relation between neuroticism and perceived stress (Hemenover & Dienstbier, 1996). Because openness and ambiguity intolerance are likely to be related to subjective well-being only in particular life situations, we propose that these relations may be due to appraisals of this situation. Suitable appraisals can be found in the literature on coping with stressful situations.

The beginning of a life transition is a stressful situation even when it is a largely positive transition (Cantor, Norem, Niendenthal, Langston, & Brower, 1987). Lazarus and Folkman (1984) suggested that when people are in a stressful situation they tend to appraise the situation as a threat or a challenge. Appraising a situation as exerting potential threat reflects a lack of confidence in one's ability to cope with this situation, and a concern that this situation might cause harm to the individual. In contrast, appraising a situation as challenging reflects confidence in one's ability to cope with the situation as well as anticipation for the future rewards that successful coping may bring. As a result, threat appraisals co-occur with negative psychological outcomes, and in particular with experiencing anxiety, whereas challenge appraisals co-occur with positive psychological outcomes, and in particular with positive affect (Folkman & Lazarus, 1985; Skinner & Brewer, 2002). Therefore, we expect that openness and ambiguity intolerance would be related to subjective well-being in the beginning of a life transition through threat and challenge appraisals of the new life situation. Indeed, as openness is typically unrelated to life satisfaction we may find that it is related to life satisfaction in this context only through appraisals.

Later on in the university studies challenge and threat appraisals are not likely to be related to the trait ambiguity intolerance because by then they are likely to loose their relevance to this trait. However, because openness is still likely to be relevant to well-being later in the university studies due to its component of intellect it may continue to be related to well-being through challenge and threat appraisals.

The current study took place at the beginning of the academic year. First year students were compared with more advanced students. We measured the traits openness and ambiguity intolerance, challenge and threat appraisals of this life situation, and well-being. Based on the

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relationships proposed on the literature, a model was developed (see Figure 1). We expected ambiguity intolerance to be related to subjective well-being through perceptions of challenge or threat only in the beginning of the life transition. In contrast, we expected openness to be related to subjective well-being through perceptions of challenge and threat at the beginning of the life transition as well as later on.

Method

Participants and procedure. 510 students participated in the study for extra course credit or for a chance of winning approximately £50 in a lottery. They completed the questionnaires online at the beginning of the academic year. Of these, 298 were first year students (235 females; mean age was 19, *SD* = 4) and 212 were advanced students (152 females; mean age was 21, *SD* = 4).

Measures

Unless stated otherwise, all of the measures were rated on a scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). In addition, all scores were computed by averaging the ratings of the items that comprise the relevant index.

Ambiguity intolerance. We used the 8-item Uncertainty Tolerance Scale (UTS; Dalbert, 1999; an example item is "I like to know what to expect") due to its good statistical properties. Indeed, the scale had good internal reliability in the current study (Cronbach α = .71).

Openness. We used the 10 items measuring openness (e.g., "curious about many different things") from the Big Five Inventory (John, Donahue, & Kentle, 1991). This measure has good reliability and validity (see John & Srivastava, 1999; in this sample α = .81).

Threat and challenge appraisals. We comprised a questionnaire to measure stress appraisal based on the Cognitive Appraisal Scale (Skinner & Brewer, 1999) with some modifications. Many of the items measuring threat in the original scale of Skinner and Brewer (1999) tapped directly on anxiety. Yet, we aimed to use anxiety as an outcome indicator. Therefore, it was important to clearly differentiate these concepts. We therefore developed new items that measure threat but not anxiety (e.g., "I feel that difficulties could pile up so much that I might not be able to overcome them"). In addition, some of the challenge items were adapted to the context of university studies (e.g., "This challenging situation as a student in the university motivates me to increase my efforts"). Some items were added in order to increase reliability (e.g., "I view the university studies as a challenge."). The questionnaire included 18 items, 9 items measuring challenge appraisal and 9 items measuring threat appraisal. The internal reliabilities of the challenge and threat indexes were 0.77 and 0.83, respectively.

Well-being indicators. The term 'subjective well-being' typically includes three components: positive affect, negative affect, and satisfaction with life (see, e.g., DeNeve & Cooper, 1998). Therefore, we measured these three components. In addition, we measured anxiety as we anticipated that it would be particularly relevant in the beginning of a life transition, due to the stress that is likely to occur in a new life situation (e.g., Holmes & Rahe, 1967). All of the well-being indicators have been used vastly in research. These included: (1) The satisfaction with life scale (Diener, Emmons, Larsen & Griffin, 1985). This instrument includes five items (e.g., "I am satisfied with my life", in this study $\alpha = .82$). (2) Anxiety measured with Spielberger (1983)'s State-Trait Anxiety Inventory. Participants rated how they felt during the past week on a scale ranging from 1 (*not at all*) to 4 (*very much*) (e.g., "During the past week, I felt worried about possible misfortune."). The internal reliability (5 items) was 0.83

in this study. (3) Positive and negative affect were measured with the 20-item PANAS (Watson, Clark, & Tellegen, 1988), asking about participants' feelings in the past week on a scale ranging from 1 (*not at all*) to 4 (*very much*). The PANAS had good internal reliabilities ($\alpha = .86$ for negative affect, and $\alpha = .87$ for positive affect).

Results

Statistical information on the variables in both samples is presented in Table 1. Significant differences were found between first- and advanced year students only on openness, $t (508) = 2.45$, $p < .05$ and anxiety, $t (508) = 2.25$, $p < .05$, with advanced-year students scoring higher on both variables.

The patterns of correlations among the variables are presented in Table 2. The correlation between openness and ambiguity intolerance was much stronger in first year students compared with more advanced students ($r = -.42$ and $-.25$, respectively), suggesting that these traits may be more functionally similar in the beginning of a life transition. In a test of differences between independent correlations, these two correlations were significantly different from one another, $z = 2.13$, $p < .05$. Yet, even in first year students this correlation is not strong enough to suggest that ambiguity intolerance and openness are the same, pointing to the merit of studying both. Similarly, the correlations among the subjective well-being indicators suggest that they differ from one another; hence they should be examined separately. Although a few of these correlations can be considered very high (.72 for negative affect and anxiety for advanced students), they cannot be considered multicollinear according to Tabachnick and Fidell (2007). Finally, the correlations between challenge and threat appraisal, ($r = -.31$ and $-.40$ in first year students and advanced students, respectively, both p's $ < .01$), suggest that one is not the complete opposite of the other. Therefore, these concepts should also be examined separately

and they might produce different results. These correlations were not significantly different from each other, $z = 1.27$, $p = .20$.

To examine the relations between the traits and the well-being indicators simultaneously and to examine the mediating roles of appraisals the data were subjected to multigroup path analyses, using the software AMOS. The model assessed the direct relations of openness and ambiguity intolerance to the four indicators of well being, as well as the mediation of challenge and threat appraisals of these relations. All of the subjective well-being indicators were allowed to correlate with one another. Because of the gender imbalance in this sample, we entered gender into the model as a predictor of openness and ambiguity intolerance, thereby ensuring that the findings would be controlled for gender. The final empirical models with their standard coefficients are presented in Figure 2. To facilitate focusing on the relations of interest in this paper, only significant paths are presented in the figures, and gender and covariance are not presented.

Each model was tested twice: first, all parameters were free to vary across groups. This analysis was followed by another test with all parameters fixed to be invariant across groups (Byrne, 2004). The initial test of the multigroup model for openness had a good fit to the data ($\chi^2/df = 4.025$; CFI = .96; NNFI = .95. RMSEA = .077). Openness was positively related to positive affect both directly and indirectly through challenge appraisals, and it was related to satisfaction with life indirectly through challenge appraisals. Yet in this study, openness was also related indirectly to anxiety and negative affect, through threat appraisals. Testing for the invariance of the model across groups suggested a good fit to the data ($\chi^2/df = 2.814$; CFI = .96; NNFI = .94. RMSEA = .060). A test of difference between the two models showed no significant difference between free and fixed models [$\Delta\chi^2 (14) = 22.45$, p > .05] suggesting that the

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proposed model is adequate to both first- and advanced-year students. Therefore, with regard to openness, it appears that it is related to subjective well-being through challenge and threat appraisals both in the beginning of the university studies and later on.

The same procedure was used to test the model proposed regarding ambiguity intolerance in both groups. The first multigroup test for ambiguity intolerance had an acceptable fit to the data (χ^2/df = 4.632; CFI = .96; NNFI = .94. RMSEA = .083). For first-year students, intolerance was positively related to negative affect and to anxiety both directly and indirectly through threat appraisals. It was also indirectly related to positive affect and life satisfaction through challenge appraisals. For advanced-year students, however, all direct paths from ambiguity intolerance to challenge, threat, negative affect, and anxiety were reduced to non-significance, whereas all other associations remain. Testing for the invariance of the model across groups suggested a poorer, but still acceptable fit to the data (χ^2/df = 3.271; CFI = .94; NNFI = .92. RMSEA = .067). A test of difference between the two models found a significant difference between free and fixed models [$\Delta\chi^2$ (14) = 28.18, p < .05]. These results suggest that the model is not adequate for both groups. Thus, the suggested relationships between ambiguity intolerance and subjective well-being are clearly specific to the beginning of the university studies.

Discussion

As we suggested, in the beginning of university studies, ambiguity intolerance and openness were both related to challenge and threat appraisals and these appraisals mediated the relations of these traits to well-being. However, after the novelty of the situation has faded, ambiguity intolerance and openness differed in their pattern of associations. Later in this life situation, openness was still related to both challenge and threat appraisals, whereas ambiguity

intolerance was not related to any of the proposed appraisals or to well-being. We next discuss this differential pattern of results in the beginning of this life transition vs. later on.

Ambiguity intolerance was related to challenge and threat appraisals only in first year students, and it was only related to subjective well-being in first year students compared with advanced students. Thus, it is clearly relevant mainly in the beginning of a life transition. Openness, however, was similarly related to well-being and to challenge and threat appraisals in beginning of this life transition as well as later on. Openness is a broader trait than ambiguity intolerance and therefore has multiple aspects including a component of novelty and a component of intellect. The aspect of novelty in the trait openness may have been relevant to well-being at the beginning of university studies, whereas the aspect of intellect may have been relevant both in the beginning of university studies and later on. This possibility should be tested directly in future research using facets of openness of the NEO-PI-R (Costa & McCrae, 1992) predicting that the actions facet would be particularly relevant to subjective well-being at the beginning of university studies whereas the ideas facet would be particularly relevant to subjective well-being later on at university. In addition, future research should examine the proposed relations on a transition to a life situation that does not require intellect or any other aspect of openness, such as the transition to a new job that does not require intellectual or emotional openness.

The current findings add to our understanding of person-environment fit and well-being. It suggests that people have higher well-being when they are in a life situation that matches their traits. This was evident in the finding that compared with individuals low on ambiguity intolerance, those high on this trait had higher levels of well-being in the beginning of a life transition, but not later on.

More broadly, the current set of findings contributes to our understanding of person-situation interactions, particularly in the area of well-being, thereby supporting calls for more research that considers contexts, in order to achieve a more sophisticated understanding of how personality manifests itself (e.g., Borkenau, Riemann, Spinath, & Angleitner, 2006; Cervone, 2005; Shoda , Lee Tiernan, & Mischel, 2002).

Our study demonstrates that the relations between personality and well-being can be dependent on context, and that such contextual relations are mediated by appraisals of the situation. It suggests that the field could benefit from more research that examines contextual relations between personality and well-being in order to progress toward better integration of the person and the situation.

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Table 1

Descriptive statistics for first- and advanced year samples

	First-year students						Advanced-year students					
	M	SD	Skewness	SE	Kurtosis	SE	M	SD	Skewness	SE	Kurtosis	SE
1. Ambiguity intolerance	4.04	.81	.04	.14	-.11	.28	4.01	.74	-.02	.17	.66	.33
2. Openness	4.30	.84	-.02	.14	.24	.28	4.49	.84	-.03	.17	-.65	.33
3. Challenge	5.69	.60	-.73	.14	.96	.28	5.71	.64	-.53	.17	.27	.33
4. Threat	4.28	.97	-.07	.14	-.22	.28	4.22	.99	-.21	.17	-.28	.33
5. Life Satisfaction	4.75	1.20	-.44	.14	-.14	.28	4.59	1.30	-.53	.17	-.37	.33
6. Positive Affect	2.91	.57	-.53	.14	-.28	.28	2.82	.61	-.31	.17	-.36	.33
7. Negative Affect	1.92	.62	.74	.14	-.16	.28	1.96	.63	.69	.17	.17	.33
8. Anxiety	2.40	.72	.14	.14	-.57	.28	2.55	.71	.16	.17	-.64	.33

Table 2

Correlations among all Variables

	1	2	3	4	5	6	7	8
1. Ambiguity intolerance	1.00	-.25**	-.06	.13	-.15*	-.18**	.03	.08
2. Openness	-.42**	1.00	.29**	-.21**	-.04	.33**	.01	-.06
3. Challenge	-.12*	.26**	1.00	-.40**	.33**	.39**	-.33**	-.29**
4. Threat	.30**	-.23**	-.31**	1.00	-.41**	-.35**	.52**	.58**
5. Life Satisfaction	-.14*	.10	.36**	-.26**	1.00	.40**	-.43**	-.44**
6. Positive Affect	-.24**	.38**	.54**	-.38**	.37**	1.00	-.26**	-.47**
7. Negative Affect	.33**	-.09	-.26**	.61**	-.30**	-.20**	1.00	.70**
8. Anxiety	.38**	-.18**	-.29**	.67**	-.35**	-.44**	.72**	1.00

Note. Correlations for first year students are under the diagonal; correlations for advanced students are above the diagonal

* *p* < .05. ** *p* < .01.

Figure Captions

Figure 1. Model of the expected relationships between traits and well-being as mediated by appraisals.

Figure 2. Path analyses of the relationships between traits and well-being as mediated by appraisals.
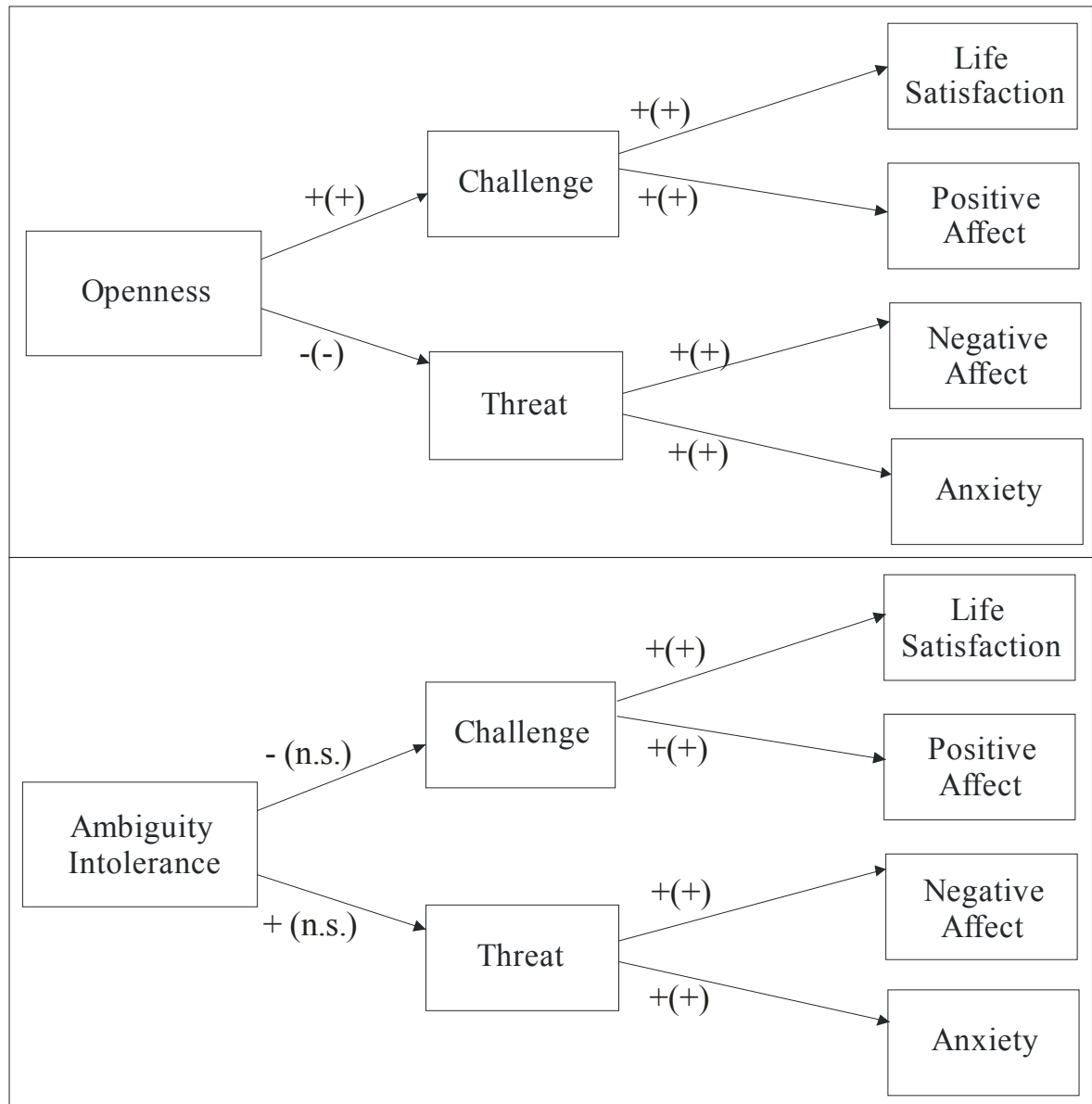
Figure 1
Note. Expected direction of relationships presented out of parentheses are for first-year students and estimates presented in parentheses are for advanced-year students.
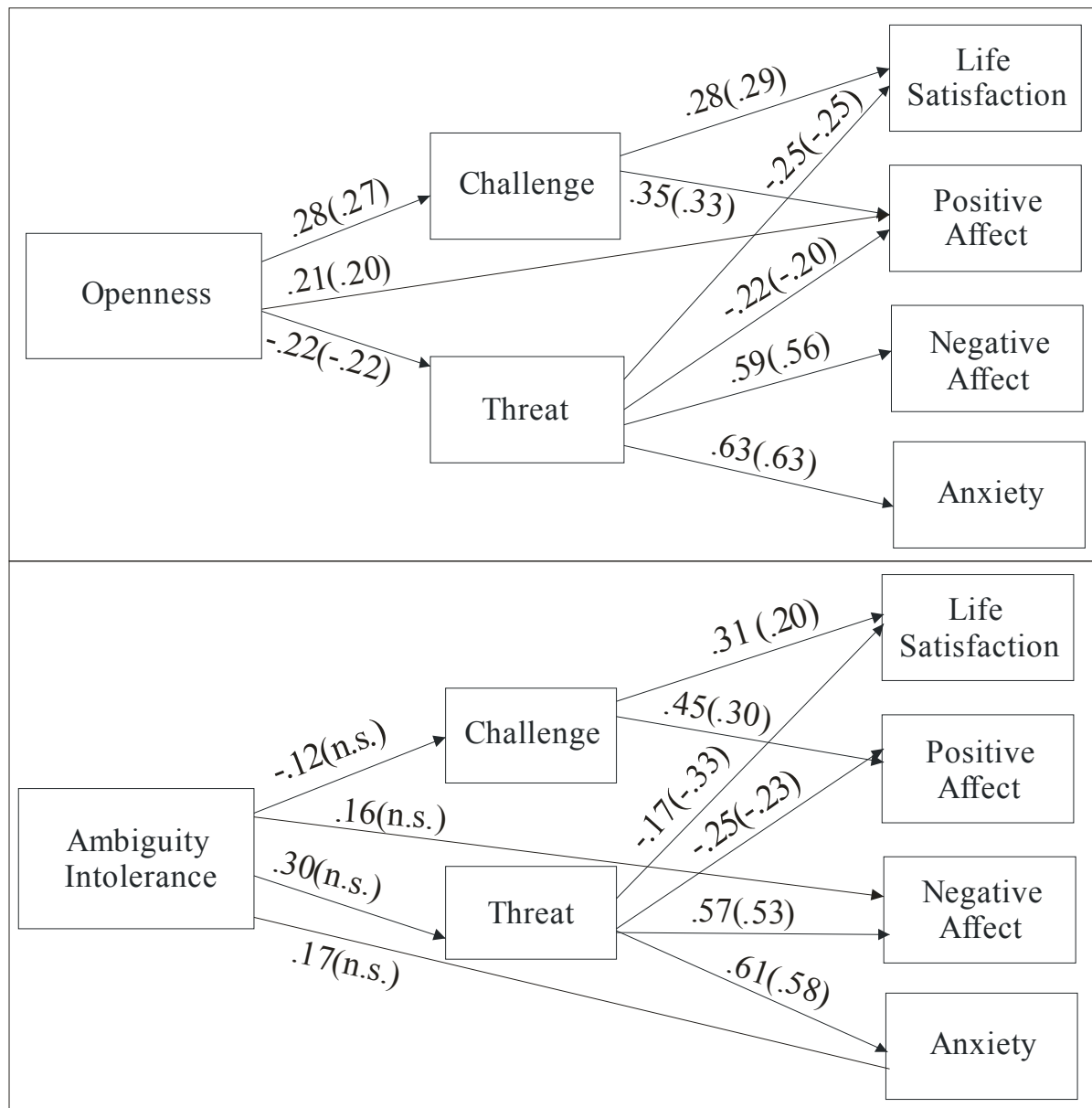
Figure 2
Note. Standardized estimates presented out of parentheses are for first-year students, and estimates presented in parentheses are for advanced-year students; n.s. = p > .05.