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Abstract

The authors aimed to extend the literature in self-determination theory (SDT) to understand the relations between college environmental variables (faculty and peer support) and academic major satisfaction. The study was disseminated via an online platform to 320 students attending a large midwestern university. Based on SDT, it was hypothesized that student perceptions of their volitional autonomy, competence, and relatedness in their academic major would fully mediate the relations between perceived faculty and peer supports and major satisfaction. This hypothesized model was tested against a partially mediated model and an alternate model that further tested the directionality of the argument. Results from structural equation modeling partially supported the hypotheses. Faculty and peer support, respectively, significantly contributed to students' experience of volitional autonomy in their major (β s = .23 and .39), perceived competence in their major (β s = .31 and .37), and relatedness in their major (β s = .29 and .56). Volitional autonomy in a major fully mediated the relationship between faculty support and major satisfaction ($M = .14$, $SE = .05$, $p < .01$, 95% confidence interval CI [.04, .24]) and the relationship between peer support and academic major satisfaction ($M = .22$, $SE = .02$, $p < .05$, 95% CI [.10, .34]). The hypothesized model was found to be superior than the partially mediated and alternate models. Thus, the authors concluded that SDT is a useful framework for understanding the relationship between faculty and peer supports, psychological needs, and major satisfaction.

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Comments

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College Environment and Basic Psychological Needs: Predicting Academic Major
Satisfaction

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Abstract

The present authors aimed to extend the literature in self-determination theory (SDT) to understand the relations between college environmental variables (faculty and peer support) and academic major satisfaction. The study was disseminated via an online platform to 320 students attending a large Midwestern university. Based on SDT, it was hypothesized that student perceptions of their volitional autonomy, competence, and relatedness in their academic major would fully mediate the relations between perceived faculty and peer supports and major satisfaction. This hypothesized model was tested against a partially mediated model and an alternate model which further tested the directionality of the argument. Results from structural equation modeling partially supported the hypotheses. Faculty and peer support significantly contributed to students' experience of volitional autonomy in their major ($\beta = .23, .39$), perceived competence in their major ($\beta = .31, .37$), and relatedness in their major ($\beta = .29, .56$). Volitional autonomy in major fully mediated the relationship between faculty support and major satisfaction ($M = .14, p < .01, SE = .05, 95\% CI = [.04, .24]$) and the relationship between peer support and academic major satisfaction ($M = .22, p < .05, SE = .02, 95\% CI = [.10, .34]$). The hypothesized model was found to be superior than the partially mediated and alternate models. Thus, the authors conclude that SDT is a useful framework for understanding the relationship between faculty and peer supports, psychological needs, and major satisfaction.

Key Words: self-determination theory, academic major satisfaction, faculty support, peer support, basic psychological needs

Public Significance Statement: When students feel supported by faculty and peers in their academic major, students feel more able to make their own choices, to succeed academically, and to connect with others in their major. Students' sense of autonomy in their major plays an important role in explaining the relationship between perceived faculty and peer support and students' satisfaction in their academic major.

College Environment and Basic Psychological Needs: Predicting Academic Major Satisfaction

The subjective experiences that students have in the university setting play a key role in determining whether they will be successful in college (Richardson, Abraham, & Bond, 2012), and one central component to such important outcomes is students' experience in their academic major. Academic major satisfaction refers to a student's overall satisfaction with their field of study, including enjoyment of classes, experiences with faculty, advisors, and peers, and any other interactions related to their academic department (e.g., McIlveen, Beccaria, & Burton, 2013; Nauta, 2007). Prior research has linked this construct to the success of college students, such as a lower likelihood of dropping out of school (Nauta, 2007) and higher GPA (e.g., McIlveen, et al., 2013), both of which significantly impact students' ability to secure jobs after their time in college. Given the strong ties between satisfaction with one's academic major and career outcomes like subjective career distress (e.g., Pesch, Larson, & Surapaneni, 2016), it is crucial for researchers to understand what factors relate to this important outcome.

Much of the research in this area has focused on identifying individual differences which contribute to students' major satisfaction (e.g., Leach & Patall, 2013; Logue, Lounsbury, Hupta & Leong, 2007; Tranberg, Slane, & Ekeberg, 1993). However, little research addresses what kinds of academic environments are most effective at promoting academic major satisfaction, and what research there is lacks theoretical grounding. The present study attempts to extend this literature by providing a theoretical framework for understanding how college environments impacts academic major satisfaction. Namely, we propose that two college environmental factors will be related to academic major satisfaction, and that this relationship will be fully mediated by three basic psychological needs in an academic context.

Self-Determination Theory

Self-determination theory (SDT) is a theory of motivation which was chosen by the authors due to robust support for the theory's explanatory power in relating environmental characteristics to positive outcomes (Deci & Ryan, 1980, 1991). One sub-theory within SDT is Basic Psychological Needs Theory (BPNT; Ryan & Deci, 2000), which describes three needs which are necessary to well-being in a particular context: volitional autonomy, or the sense that one is in charge of one's own actions and decisions in that domain, perceived competence, or the perception that one is able to accomplish important tasks in that domain, and relatedness, or the sense that one is connected to important people in that domain (Ryan & Deci, 2000). In the present study, the authors were interested in the extent to which students' needs for autonomy, competence, and relatedness were satisfied in the domain of their academic major. If the academic environment fails to support these needs, SDT predicts individuals will be less satisfied in their academic major. In this way, the three needs specific to major are posited in SDT to fully mediate or explain the relationship between specific environmental variables and the outcome variable (i.e., academic major satisfaction). The needs are the mechanism through which the environment is expected to increase one's satisfaction with their major. This explanation, an important theoretical extension to the current literature, is why the authors chose SDT over other theories in the literature.

Prior research in this area has demonstrated the utility of SDT in predicting important outcomes related to academic major satisfaction, such as career well-being (Pesch, et al., 2016) and career indecision (Guay, Senecal, Gauthier, & Fernet, 2003). There is also reason to suspect that the three basic psychological needs identified by this theory, when applied to the specific domain of major satisfaction, would predict student's satisfaction with their major. Volitional

autonomy (as well as a similar construct, work volition) has been found to be related to academic major satisfaction (e.g., Jadidian & Duffy, 2012; Pesch et al., 2016). Perceived academic competence has also been linked to satisfaction with one's major (e.g., Larson, Toulouse, Ngumba, Fitzpatrick, & Heppner, 1994; Pesch et al., 2016), while perceived competence in making a career decision (i.e., career decision self-efficacy) has consistently positively related to academic major satisfaction in post-secondary samples (e.g., Jadidian & Duffy, 2012; Komarraju, Swanson, & Nadler, 2014). While little research has examined the relation between relatedness and major satisfaction, one study found relatedness in class to predict students' satisfaction with instructors (Filak & Sheldon, 2003). Moreover, a similar construct to relatedness in class, called perceptions of affiliation in a classroom, was shown to positively correlate with major satisfaction (Deemer, 2015). In an adolescent sample, school satisfaction was significantly related to volitional autonomy at school, perceived competence at school, and relatedness at school (Tian, Chen, & Huebner, 2014).

Academic Environmental Factors

Given the wide range of academic environmental factors potentially associated with academic major satisfaction as well as the basic psychological needs in major, two minimally examined areas were chosen for examination within an SDT model – faculty support and peer support.

Faculty support. To our knowledge, the role of faculty in students' academic major satisfaction has rarely been examined, although a few studies indirectly suggest a positive relationship between these constructs. For instance, first-year students were more satisfied with their university experience when they reported more informal contact with faculty (Barry & Okun, 2011). In several studies, the opportunity to connect with faculty members has been found

to be a crucial component to student satisfaction within their major or department (e.g., Robbins et al., 2004). More specifically, the relationship between student and advisor has been found to be a significant predictor of satisfaction with the university in undergraduate students (Corts, Lounsbury, Saudargas, & Tatum, 2000). Thus, there is reason to suspect that students will be satisfied within their major to the extent that they feel supported by the faculty members in their respective departments.

There is a paucity of research located by the authors which connects faculty support to volitional autonomy, perceived competence, and relatedness in a college academic context, with one exception. Copeland and Levesque-Bristol (2011) reported instructor autonomy support to be positively related to all three needs in a first-year university class. One additional study was located that provides indirect evidence in that, in a Chinese secondary school sample, teacher support was significantly predictive of volitional autonomy, perceived competence, and relatedness at school (Tian, Tian, & Huebner, 2016). Although there are differences in university and secondary school academic contexts (e.g., a greater sense of volitional autonomy in university settings), these studies provide preliminary support for the hypothesized relations between faculty support and basic psychological needs.

Peer support. The contribution of peer support to academic major satisfaction has also received little examination. Social support from peers has been shown to relate to other important university student outcomes like retention (e.g., Robbins et al., 2004) and GPA (e.g., Richardson et al., 2012). Two studies were located in which peer support positively contributed to closely related constructs of program satisfaction in graduate students (Tompkins et al., 2016) and satisfaction with the university for first-year undergraduate students (Barry & Okun, 2011).

Similarly, in Dodge and colleagues' (2009) qualitative and quantitative analyses, the presence of a peer support group was a key factor in student retention in an athletic training program.

In terms of the relations between peer support and volitional autonomy, perceived competence, and relatedness in major, no studies using college samples were located which investigated peer support and the three needs. Positive classroom social climates were significantly predictive of volitional autonomy, perceived competence, and relatedness in a Korean secondary school sample (Joe, Hiver, & Al-Hoorie, 2017). Additionally, Tian and colleagues (2016) in a Chinese secondary school sample found that classmate support was significantly predictive of volitional autonomy, perceived competence, and relatedness at school. Given the differences between both secondary schools and university settings as well as cultural differences between Asian and American cultures, the present authors aimed to extend these findings by investigating the relationships between these constructs in a U.S. university student sample.

Basic Psychological Needs in the Major as Mediators

There are also few studies in which satisfaction of basic psychological needs in students' academic majors serve as mediators between faculty and peer support and academic major satisfaction. One study using a college sample was identified: Pesch and colleagues showed in a university sample that volitional autonomy fully mediated the relation between mothers' autonomy support and academic major satisfaction, while perceived academic competence fully mediated the relation between fathers' autonomy support and academic major satisfaction (Pesch et al., 2016). One other related study using a Chinese secondary school sample found volitional autonomy, perceived competence, and relatedness at school to partially mediate the relation between teacher support and well-being at school (a construct including school satisfaction; Tian

et al., 2016). Moreover, perceived competence and relatedness at school fully mediated the relation between classmate support and well-being at school.

In short, some work has laid the foundation for this study suggesting initial support for the SDT proposition that the basic needs in one's academic major should fully explain the relationship between the environmental supports of faculty and peers and academic major satisfaction. This study is important in that it is the first to specifically address the role of the three basic needs in one's major as the mechanisms through which faculty and peer supports relate to academic major satisfaction.

The Present Study

The goal of the present study is to present a model grounded in self-determination theory which explains the relations between faculty and peer support in the academic environment and academic major satisfaction. SDT proposes that this relationship will be fully explained or mediated by the extent to which students' need for volitional autonomy, perceived competence, and relatedness are satisfied in the domain of their academic major.

Hypothesis 1: Volitional autonomy, perceived competence and relatedness in students' academic major will be directly predicted by faculty support and peer support. Satisfaction of these three needs, in turn, will directly predict academic major satisfaction.

Hypothesis 2: Satisfaction of the basic psychological needs will fully mediate the relations between faculty and peer support and academic major satisfaction.

As mentioned earlier, SDT posits that the basic psychological needs in major will fully mediate the relationship between faculty and peer supports and academic major satisfaction. Thus, we hypothesized a partially mediated model would not provide a better fit to the data than a fully mediated model. Moreover an alternative model (Figure 2) is presented to reverse the

directionality of the relations between the needs and academic major satisfaction, in that one could argue that the extent to which individuals feel their needs are met would predict how supportive they perceive their environments to be. Based on SDT, we expected the hypothesized model to provide a better fit to the data than this alternate model.

Hypothesis 3: A fully mediated model (Figure 1) will provide a more parsimonious fit to the data than a partially mediated model. The hypothesized theoretical model (Figure 1) will also provide a better fit to the data than an alternate theoretical model (Figure 2).

Method

Participants

The sample contained 320 students recruited from introductory psychology courses at a large Midwestern university who reported that they had declared their major. Identification of major was optional, and for the students who responded ($n = 243$), 68 majors across seven colleges were represented. When asked their gender identity, 56.5% of participants identified as women and 43.5% identified as men; none identified as “other.” In reporting their year in school, 34.7% were Freshmen, 32.8% were Sophomores, 18.8% were Juniors, 12.5% were Seniors, and 1.3% reported “Other” (e.g. 5th year Senior). Their ages range from 18-37 with a mean of 19.75 years ($SD = 2.07$). When asked their racial/ethnic identity, 6.3% were African American, 8.4% were Asian American/Pacific Islander, 74.2% were Caucasian/White, 3.4% were Hispanic or Latino/a, .3% were Native American, and 8.8% chose the option, “Other” (with their written “Other” responses including “Asian,” “Asian/White,” “Biracial,” “East Asian,” “Mixed,” and “Multiracial”). The final .6% preferred not to answer. Participants received extra credit for their participation.

Measures

Demographics. The demographic measures were age, ethnicity, gender, year in school, certainty of major choice, and academic major.

Faculty support. Faculty support was measured by combining two subscales from the Institutional Integration Scale (IIS; Pascarella & Terenzini, 1983)—the interactions with faculty subscale and the faculty concerns for student development and teaching subscale—which have been combined in previous research due to high correlations ($r = .66$, French & Oaks, 2004). The faculty support scale subsumes students' perceptions of interacting with faculty in formal and informal contexts and students' perceptions of faculty's concern for their academic growth. It contains 10 five-point Likert items ranging from 1 (*No agreement*) to 5 (*Much agreement*), in which higher scores indicate more positive experiences with faculty members. An example item was, "I developed a close, personal relationship with at least one faculty member." In French and Oakes (2004), the α s were .89 and .88; the two subscales moderately correlated with peer support. The α in this sample was .90.

Peer support. Peer support was measured by the peer-group interaction subscale from the IIS which measures students' perceptions of their experiences with peers. It consisted of 10 five-point Likert items ranging from 1 (*No agreement*) to 5 (*Much agreement*), where higher scores indicate a more positive experience of interacting with their peers in college. An example was, "I have developed close personal relationships with other students." French and Oakes (2004) reported an α of .84; the subscale correlated moderately with faculty support. The α in this sample was .89.

Volitional autonomy in major. Volitional autonomy in major was operationalized by adapting the volitional autonomy subscale of the Basic Motivational Psychological Needs scale

(BMPN: Sheldon & Hilpert, 2012) in a manner consistent with prior research in order to make the questionnaire domain-specific to students' academic major (i.e., asking participants to think about their academic major and adding "in major" to item content; Yang, Zhang, & Sheldon, 2018; Evans & Bonneville-Roussy, 2016). The volitional autonomy in major subscale consisted of three five-point Likert items ranging from 1 (*No agreement*) to 5 (*Much agreement*) with higher scores indicating more volitional autonomy in the major. The items consisted of: "I was free to do things my own way in my major," "My choices in my major expressed my 'true self,'" and "I was really doing what interests me in my major." Sheldon and Hilpert (2012) yielded an α of .69; it was related $r = .54$ and $.59$ with perceived competence and relatedness with each distinctly loading on its own factor. The α in this study was .80.

Perceived competence in major. Perceived competence in major was measured with the perceived competence subscale of the BMPN (Sheldon & Hilpert, 2012) with the aforementioned modifications (i.e., asking participants to think about their academic major and adding "in major" to item content). The subscale consisted of three five-point Likert items ranging from 1 (*No agreement*) to 5 (*Much agreement*) with higher scores indicating more perceived competence in major. An example item is "I took on and mastered hard challenges in my major," measuring the extent to which participants perceive themselves to be competent in their major. Sheldon and Hilpert (2012) reported an α of .71; it correlated $.54$ and $.51$ with volitional autonomy and relatedness, and loaded as a distinct factor. The α in this study was .82.

Relatedness in major. Relatedness in major was operationalized by the relatedness subscale of the BMPN scale (Sheldon & Hilpert, 2012) with the aforementioned modification (i.e., asking participants to think about their academic major and adding "in major" to item content). The relatedness in major subscale consisted of three five-point Likert items ranging

from 1 (*No agreement*) to 5 (*Much agreement*) with higher scores indicating more relatedness. An example item is, “In my major I felt a sense of contact with people who care for me,” measuring the extent to which participants felt their need for relatedness in their major was met. Sheldon and Hilpert (2012) yielded an α of .71; it correlated .59 and .51 with volitional autonomy and perceived competence. The α in this sample was $\alpha = .86$.

Academic major satisfaction. The Academic Major Satisfaction Scale (AMSS; Nauta, 2007) consists of six 5-point Likert items ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), where a higher score indicates greater satisfaction with the students’ major. An example was, “Overall, I am happy with the major I’ve chosen.” Nauta (2007) reported α s of .94 and .90; the scale moderately correlated with career decision self-efficacy and career indecisiveness. The α in this this sample was .90.

Procedure

Before the study was disseminated to participants via the Online Survey Platform, Qualtrics (2017, institutional review approval was obtained. Participants were recruited using the department’s online research participation system. Recruited students who chose to participate completed the informed consent, the demographics, the IIS, the BMPN, and the AMSS.

Results

Preliminary Analyses and Descriptive Statistics

After missing data and outliers were systematically removed, the proportion of responses missing was calculated, which ranged from 0% for faculty support and academic major satisfaction items to 2% for the perceived competence items. The authors used full information maximum likelihood which estimates parameters based on complete data and implied values of missing data (Schlomer, Bauman, & Card, 2010). When Mardia’s test for multivariate normality

suggested the data were not normally distributed, MLR was chosen due to its robustness to non-normality (Muthén & Muthén, 2012). Descriptive statistics, including means, standard deviations, and correlations for the variables of interest are represented in Table 1.

Measurement Model

Prior to assessing the fit of the measurement model, three parcels were created in SPSS for each latent variable in the model: faculty support, peer support, volitional autonomy in major, perceived competence in major, and relatedness in major. Parceling has become common practice in structural equation modeling, and thus the authors utilized the accepted procedure (which includes exploratory factor analyses and assigning items to parcels such that the average loadings would be approximately equal) outlined by Russell, Kahn, Spoth, and Altmaier (1998). According to the procedure for mediation analyses proposed by Anderson and Gerbing (1988), confirmatory factor analysis was first performed to assess whether the measurement model was a good fit to the data using MPlus version 7.4 (Muthén & Muthén, 2012).

The guidelines of Hu and Bentler (1999) were used as standards for model fit: comparative fit index (CFI) of .95 or greater, root-mean-square error of approximation (RMSEA) of .06 or less, and standardized root-mean-square residual (SRMR) of .08 or less. By these indices, the measurement model yielded a good fit to the data, with the exception of a high chi square value and a corresponding significant p value: [$\chi^2(120, N = 320) = 238.77, p < .001$], RMSEA = .06, CFI = .96, SRMR = .05. Given that large sample sizes such as that of the present study ($N = 320$) have been found to influence the chi square value, this was not considered problematic or surprising by the present authors (e.g., Kline, 2011). The loadings of the measured variables on the latent variables were all significant at a level of $p < .001$, and thus the variables appeared to be adequately measured by the parcels (Figure 3).

Structural Model

The structural model was tested using maximum likelihood in MPLUS to examine the first hypothesis. The hypothesized fully mediated structural model is shown in Figure 1. Based on the standards of Hu and Bentler (1999) previously discussed, the results of this hypothesized fully-mediated latent model (Figure 3) yielded a good fit to the data with the exception of the high chi square value [$\chi^2(122, N = 320) = 239.54, p < .001$], RMSEA = .06, CFI = .96, SRMR = .05.

The first hypothesis concerned the direct paths, and was partially supported. As shown in Figure 1, the expected significant direct effects were found from faculty support and peer support to volitional autonomy ($\beta = .23, p < .001$; $\beta = .39, p < .001$), perceived competence in major ($\beta = .31, p < .001$; $\beta = .37, p < .001$) and relatedness in major ($\beta = .29, p < .001$; $\beta = .56, p < .001$). Academic major satisfaction was significantly directly related to volitional autonomy in major ($\beta = .56, p < .001$) and to perceived competence in major ($\beta = .14, p = .03$), but not significantly directly related to relatedness in major ($p > .05$).

Hypothesis 2 concerned indirect effects and was tested using bootstrap analysis, a procedure which provides greater statistical power and avoids making assumptions regarding multivariate normality (Preacher & Hayes, 2008). A significant ($p < .05$) mean indirect effect was indicated by a confidence interval not containing 0. Of the six possible indirect paths in the model, two were found to be significant: the path from faculty support to academic major satisfaction through volitional autonomy in major ($M = .14, p < .01, SE = .05, \beta = .23 \times .56 = .13$; $95\% CI = [.04, .24]$), and the path from peer support to academic major satisfaction through volitional autonomy in major ($M = .22, p < .05, SE = .02, \beta = .39 \times .56 = .21$; $95\% CI = [.10, .34]$). Thus, hypothesis 2 was partially supported.

Hypothesis three was supported by first comparing the fully mediated model to a partially mediated model. The partially mediated model was a good fit, [$\chi^2(120, N = 320) = 238.77, p < .001$], RMSEA = .06, CFI = .96, SRMR = .05, and a chi square difference test, $\chi^2(2, N = 320) = .81, p = .67$, suggests no significant difference between the two models. Thus, the authors conclude that the fully mediated model is more parsimonious. The hypothesized model (Figure 1) was then compared to an alternate model (Figure 2) which treated volitional autonomy in major, perceived competence in major, and relatedness in major as exogenous variables, while faculty support and peer support were treated as mediators between the needs and major satisfaction. The structural model for this reversed model proved to be a poor fit to the data, $\chi^2(123, N = 320) = 304.43, p < .001$, RMSEA = .07, CFI = .94, SRMR = .07. A chi square difference test suggested there was a significant difference between these two models, thus supporting the hypothesis that the model grounded in SDT was superior $\chi^2(1, N = 320) = 40.88, p < .001$.

Discussion

The present study aimed to provide support for the utility of self-determination theory to investigate the previously understudied relations between faculty and peer support, basic psychological needs in the context of the major, and academic major satisfaction. The hypothesized fully mediated model was supported in that the model was a good fit with the data. Specifically, these findings provide evidence that volitional autonomy in the major fully mediates the relationship between students' feeling that they are supported by faculty and academic major satisfaction, and between students' feeling that they are supported by peers and academic major satisfaction. Although this finding is limited by inability to determine causality, this notion is consistent with related SDT research that has shown volitional autonomy fully

mediated the relationship of autonomy support by students' mothers and academic major satisfaction (Pesch et al., 2016). The findings in the current study provide additional support that volitional autonomy can explain the relationship between two other important groups of people in university students' lives, namely the faculty and students with whom they interact in their major, and satisfaction with their major. Given the important link between academic major satisfaction and retention (e.g., Nauta, 2007) and GPA (e.g., Leach & Patall, 2013; McIlveen et al., 2013), the present findings illustrate the importance of a closer examination of how students' experience of support from faculty and students may be linked to increasing students' volitional autonomy in their major.

The hypothesis concerning direct effects between the environmental factors and the basic psychological needs in major was supported. As shown in Figure 3, faculty support and peer support contributed to 30.0% of the variance in volitional autonomy in major, 35.6% of variance in perceived competence in major, 57.0% of the variance in relatedness in major. In short, faculty support and peer support in this study played a substantial role in meeting students' need to make their own choices, to perceive themselves as competent in their major courses and requirements, and to feel connected to other people in the major. This is consistent with previous research which suggests that faculty members have a unique and substantial role in creating academic environments which feel supportive of students (e.g., Müller & Louw, 2004; Tinto, 1993). While prior research found conceptually similar constructs to peer support to be related to basic psychological needs, such findings were tested in Asian secondary school samples (Tian et al., 2016; Joe et al., 2017). Thus, while we had reason to suspect this relation, the present study constitutes the first study showing the links between peer support and volitional autonomy, perceived competence, and relatedness in major for U.S. college students, to our knowledge.

Additionally, the hypothesized model based on SDT proved to provide a more parsimonious fit to the data than a partially mediated model, and a better fit than the reversed alternate model. In this sample, a model in which faculty and peer support predicted variance in need satisfaction was a better fit to the data than one in which the needs predicted variance in faculty and peer supports. This provides support for the directionality between variables proposed by SDT, and for using SDT as a framework for understanding the relations between environmental factors (here faculty and peer support) and academic major satisfaction.

The hypothesized fully mediated model accounted for 40.2% of the variance in academic major satisfaction; this model also proved to be more parsimonious than the partially mediated model and a better fit than the alternate model. This indicates the substantial contribution of self-determination theory as a framework for understanding the mediating role of need satisfaction in the relationship between faculty and peer support and academic major satisfaction. In addition, this study provides evidence that two environmental factors, specifically faculty and peer support, are related to academic major satisfaction. Faculty and administrators may wish to be mindful of how course structure, teaching styles, and classroom climate relate to students' experience of having autonomy, competence, and relatedness as they progress through their academic program. While the present study does not alone constitute sufficient evidence to suggest a causal relation between these factors, there is enough existing research connecting faculty behavior in the classroom with positive outcomes (e.g. Witt, Wheelless, & Allen, 2004) to suggest that faculty have an impact on student experiences.

While these findings certainly extend the current literature, there are some limitations which need to be considered. One limitation concerns the demographics of this sample being predominantly white from a research one university; future research needs to sample more

diverse student populations. Additionally, faculty support and peer support are not approximating an objective indicator of these constructs, but rather the extent to which students *feel* supported by faculty and peers. It is important to distinguish the present findings as pertaining to students' own perceptions of their college environment, basic needs, and major satisfaction, rather observable indices (e.g., GPA).

Moreover, due to the cross-sectional study design, causality cannot be determined (Maxwell & Cole, 2007; Maxwell, Cole, & Mitchell, 2011). While this study provides preliminary evidence that the theoretical framework of SDT is useful for understanding the relation between faculty and peer supports and academic major satisfaction, it does not provide causal evidence about these relations. Longitudinal or experimental designs would be helpful in future research to more conclusively determine the nature of these relationships as causal or otherwise. Another possible concern is that grade point average was neither included as a predictor, nor controlled for. Future research can shed light on the role of GPA in the present context, whether that be as a predictor or as a variable which is controlled for. Recent research by Schenkenfelder (2019), however, found no significant correlation with GPA and academic major satisfaction. Despite these limitations and opportunities for future research, this study provides preliminary support for the utility of self-determination theory as a framework for understanding students' experiences in their academic majors.

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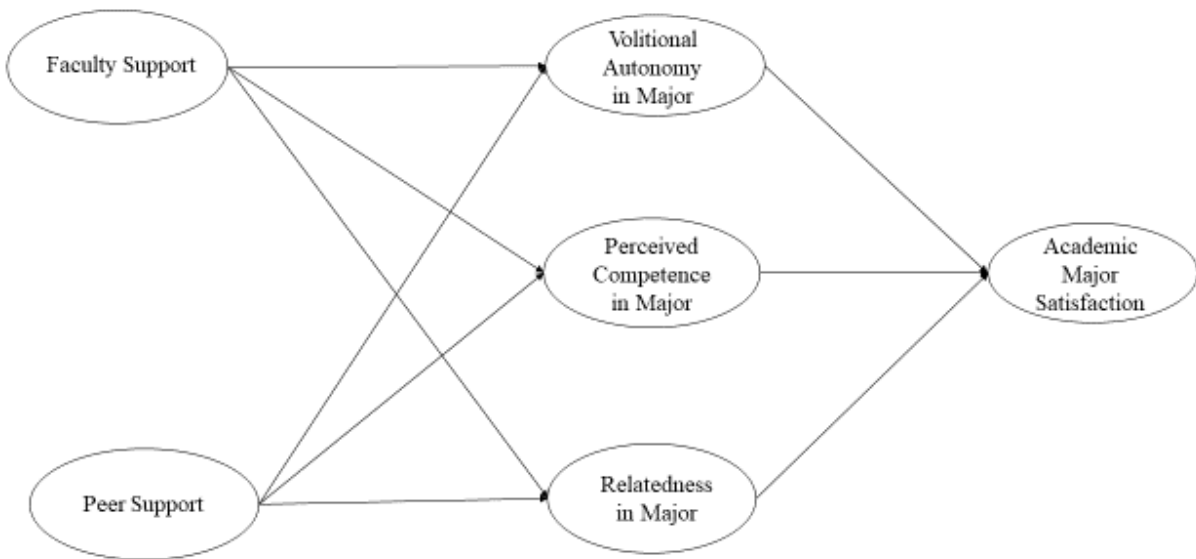
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| | 1 | 2 | 3 | 4 | 5 | 6 |
|----------------------------------|------|------|------|------|------|------|
| 1. Academic Major Satisfaction | - | | | | | |
| 2. Faculty Support | .22 | - | | | | |
| 3. Peer Support | .30 | .48 | - | | | |
| 4. Volitional Autonomy in Major | .48 | .38 | .46 | - | | |
| 5. Perceived Competence in Major | .34 | .45 | .46 | .40 | - | |
| 6. Relatedness in Major | .27 | .54 | .64 | .50 | .43 | - |
| <i>Mean</i> | 4.04 | 3.71 | 3.90 | 3.96 | 3.75 | 3.40 |
| <i>Standard Deviation</i> | .86 | .84 | .83 | .91 | .84 | 1.11 |

Table 1. Means, Standard Deviations, and Intercorrelations of Environmental Factors, Psychological Needs, and Academic Major Satisfaction

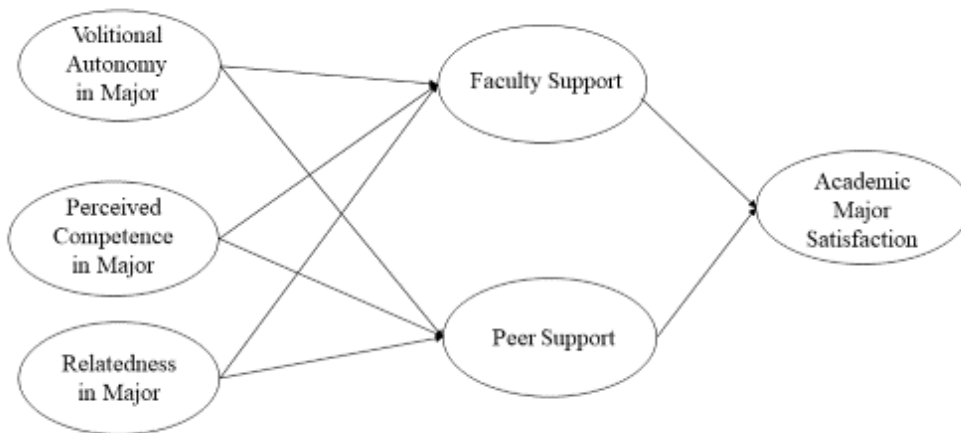
Note. N = 320. All variables are scored 1 to 5 on Likert scales, with higher scores indicating a greater degree of the construct. All correlations are significant at $p < .001$.

Figure 1. Hypothesized fully mediated model



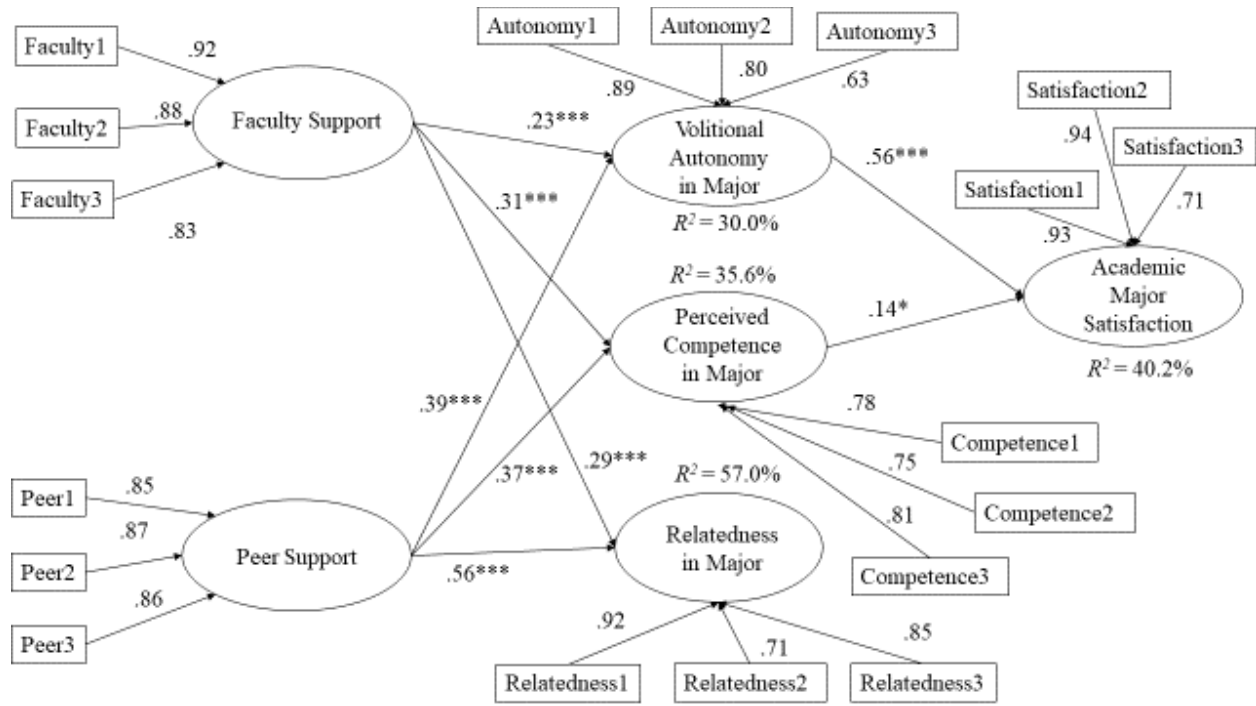
Note. Correlations among exogenous and mediating variables were allowed in the structural equation model, but are omitted for visual clarity.

Figure 2. Alternate reversed model



Note. Correlations among variables were allowed in the model, but are omitted for visual clarity.

Figure 3. Hypothesized fully mediated model results



Note. Correlations among exogenous and mediating variables were allowed in the model, but are omitted for visual clarity. Additionally, the path from relatedness in major to academic major satisfaction was also allowed, but was non-significant and thus was omitted from the figure.