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Missing Piece of the Departure Puzzle: Student-Institution Fit and Intent to Persist

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Abstract

According to prevailing theory and anecdotal evidence, the congruence between institutional attributes and students' needs, interests, and preferences plays a key role in promoting college satisfaction and retention. However, this assertion has received little direct empirical attention, and the few available studies appear to have some key limitations. This study examined the factor structure and predictive validity of a newly developed student-institution fit instrument, which was designed to avoid the problems in previous research. Confirmatory factor analyses identified several interrelated dimensions of fit, and these dimensions can be combined into a single overall fit index. Moreover, a six-factor structure of student-institution fit is similar at two institutions that differ in terms of size, control, type, region, and religious affiliation. Structural equation modeling analyses show that student-institution fit is associated with greater college satisfaction and lower social isolation; fit also has a positive, indirect effect on intent to persist. Implications for practice and future research are discussed.

Keywords: student-institution fit; person-environment fit; college students; college satisfaction; intent to persist

Despite decades of research on factors that predict college student retention and persistence, graduation rates are still fairly modest within the United States. Among students who begin their undergraduate studies at a four-year institution, 64% receive any degree within six years (certificate, associate's, or bachelor's), and this figure is only 35% for students who start at two-year public institutions (Radford, Berkner, Wheeless, & Shepherd, 2010). These high non-completion rates lead to substantial immediate and long-term financial costs for colleges and universities (see Schuh & Gamsener-Kopf, 2012). The costs are also substantial for students, who may accrue tens of thousands of dollars in debt without receiving the benefits of a college degree, as well as for U.S. society, which does not realize the economic and civic returns associated with a well-educated populace. The vast majority of studies on student attrition and graduation have examined institutional characteristics (e.g., selectivity, size, faculty-student ratio) and/or student characteristics (e.g., demographics, academic preparation, college experiences) as predictors of student departure (see Pascarella & Terenzini, 2005; Perna & Jones, 2013; Seidman, 2012). Despite the substantial research literature on this topic, the interaction between student and institutional characteristics has received little direct attention.

Many higher education constituents believe that the "fit" between institutional and student attributes plays an important role in college students' adjustment, satisfaction, and persistence. In a survey of approximately 1,000 colleges and universities, a lack of student-institution fit was named as the second-most influential institutional factor that leads to student attrition; only financial aid was rated as being more important (Habley & McClanahan, 2004). High school students' trips to visit colleges and universities are often framed as discovering whether a particular institution is right for them. Moreover, fit seems to play a logical role in this process: One can imagine how a student who would thrive at a small, religiously affiliated liberal

arts college in a rural area might fare poorly at a large, public university in a major city (and misfit in the opposite direction also seems quite plausible).

Perhaps surprisingly, then, studies that directly examine the outcomes associated with student-institution fit are somewhat rare, and research that claims to measure fit often contains some methodological issues. Therefore, it is important not only to gain a better understanding of whether and how fit predicts student outcomes, but also to develop an instrument that can measure student-institution fit effectively. The current study sought to address both of these issues by examining the factor structure, internal reliability, and predictive validity of a new student-institution fit instrument. This research is intended to shed light into the potential role of fit in shaping student success and to provide an effective means for measuring fit.

Theoretical Frameworks on Person-Environment Fit

Student-institution fit is one form of a broader concept of person-environment fit. Perhaps the seminal contribution to a person-environment fit perspective comes from Kurt Lewin, who is widely considered to be the founder of modern social psychology (Gold, 1999; Marrow, 1969). He argued that human behavior is a function of a person in his or her environment (e.g., Lewin, 1936). This emphasis on person-environment interaction—or even the consideration of the environment in any meaningful sense—stood in stark contrast to Freud and other contemporaries that focused almost exclusively on the role of the individual in explaining behavior. Person-environment or person-organization fit has also received recent attention in the psychological and organizational literature (see Ostroff & Judge, 2007; Walsh, Craik, & Price, 2000). For example, Holland (1973, 1997) developed six categories of occupational preferences that map onto a set of vocations. This framework posits that people who are employed in occupations that fit with (or match) their preferences are generally more satisfied, more

productive, and more likely to persist than those who exhibit misfit. Research on Holland's typology generally supports this prediction in both undergraduate majors and occupational settings (Allen & Robbins, 2008, 2010; Tracey & Robbins, 2006; Wolniak & Pascarella, 2005; for reviews of earlier research, see Assouline & Meir, 1987; Smart, Feldman, & Ethington, 2000).

In higher education, student-institution fit is integral to Tinto's (1975, 1993) theory of college student departure, which has achieved near-paradigmatic status in higher education (Braxton, Sullivan, & Johnson, 1997). Tinto argues that the incongruence or misfit between students' needs, interests, and preferences and those of the institution can play a key role in students' decisions to drop out. Later versions of this theory assert that students who do not fit well with the institution as a whole may ultimately become integrated with a group of friends, a faculty member, a student organization, and/or other support systems; these personal connections may compensate for a lack of fit with the institutional environment as a whole. Although Tinto's theory has been critiqued by various scholars (e.g., Braxton et al., 1997; Rendón, Jalomo, & Nora, 2000; Tierney, 1992), competing theories or modifications to Tinto's theory also generally take an "interactionist" approach. That is, they argue that the intersection of student and institutional attributes, along with the perception of that (in)congruence, shapes student departure decisions (e.g., Bean & Eaton, 2000; Braxton, Hirschy, & McClendon, 2004; Stage & Hossler, 2000).

Literature Review

Numerous studies have examined the relationship between social and academic integration and student persistence. Most notably, two meta-analyses have summarized the literature on this topic. Robbins et al. (2004) identified indicators of "social involvement" that

are essentially synonymous with social integration; these include "[t]he extent that students feel connected to the college environment; the quality of students' relationships with peers, faculty, and others in college; [and] the extent that students are involved in campus activities" (p. 267). Across 36 studies with a total of 26,263 participants, the correlation between social involvement and persistence was .17, which was comparable to the correlation between general social support and persistence. Pan (2011) also synthesized the raw correlations between social integration, academic integration, and persistence. Her meta-analytic sample for academic integration and "success outcomes" (i.e., actual persistence, intent to persist, and college grade point average) contained 71 studies with 197 effect sizes and 74,009 participants, while the 79 studies of social integration and success outcomes contained 255 effect sizes and 77,812 participants. Among studies that measured actual persistence, the mean correlation between academic integration and persistence was .16, and the mean correlation between social integration and actual persistence was .12. In short, social and academic integration have consistent—albeit somewhat modest—relationships with student persistence.

However, these studies do not bear directly on the link between student-institution fit and retention (or persistence), because fit is not synonymous with social and academic integration. According to Tinto (1993),

> Incongruence….springs from individual perceptions of not fitting into and/or of being at odds with the social and intellectual fabric of institutional life. In such situations, individuals leave not so much from the absence of integration as from the judgment of the undesirability of integration. Withdrawal mirrors, in effect, the person's decision that further attendance would not be in his/her own best interests. (p. 50)

This view suggests that fit could lead to departure independent of integration. Even if misfit does not lead to attrition, it is possible to envision how fit and integration might diverge. For instance, a hardworking student might receive strong grades (which is often considered an indicator of academic integration), but he wishes that his courses were designed quite differently (i.e., his preferred learning style does not fit with the prevailing pedagogy or curriculum). Similarly, a first-generation college student may find a couple of friends with whom she interacts very frequently (which is an indicator of social integration), but she feels she has little in common with other peers who are predominantly from upper-middle-class backgrounds.

The literature on campus climate and sense of belonging also provides some indirect evidence regarding the potential role of student-institution fit. Students who perceive a more positive campus racial climate tend to report a greater sense of belonging to their institution (Locks, Hurtado, Bowman, & Oseguera, 2008; Mendoza-Denton, Downey, Purdie, Davis, & Peitrzak, 2002), and sense of belonging is associated with greater intent to persist and actual persistence (Hausmann, Schofield, & Woods, 2007; Hausmann, Ye, Schofield, & Woods, 2009). Perceptions of prejudice and discrimination are also indirectly related to persistence among both students of color and White students (Cabrera, Nora, Terenzini, Pascarella, & Hagedorn, 1999; Nora & Cabrera, 1996). However, similar to social and academic integration, perceptions of campus climate and college sense of belonging are not indicators of fit per se. Students who feel that they "belong" may fit primarily within a particular campus niche or enclave (e.g., a group of friends, campus organization, and/or undergraduate major) without fitting well with the broader campus environment. Moreover, students might feel that the campus racial climate is hostile in some respects, but these students could simultaneously fit quite well with several other aspects of the college or university.

A number of studies have sought to examine student-institution fit, but some of these measures were confounded with exposure to positive campus environments. For example, Conyne (1978) identified eight dimensions of "mismatch," which included stressful academic calendars, an impersonal campus climate, a lack of campus locations for meeting and socializing, and a lack of physical safety. These dimensions seem to be institutional attributes that virtually all students would want to avoid (although some students may find these to be more problematic than others). In addition, Gilbreath, Kim, and Nichols (2011) identified three broad dimensions of social, academic, and physical fit. The items also reflect desirable campus environments, such as an "enjoyable social life" and "great affordability" (p. 52). This study examined the levels of institutional supplies and student needs, but a parsimonious explanation of their findings would be that exposure to positive environments predicts college satisfaction and psychological well-being. Within a religiously affiliated university, Wiese (1994) found that students who highly valued religion were more satisfied with their college choice. While it is possible that this finding reflects student-institution fit, religiosity is associated with a host of positive life outcomes among college students (Mayrl & Oeur, 2009; Small & Bowman, 2012) and general adult populations (Koenig, McCullough, & Larson, 2001; Putnam & Campbell, 2010). Thus, the link between the importance of religious involvement and college satisfaction may be primarily attributable to the overall benefits of religiosity, not any unique effect of religion at that particular school.

Wintre et al. (2008) largely avoided this positive environment issue by directly asking students the extent to which they fit with various aspects of the social, academic, and physical environment. They assessed students at six different Canadian universities, conducted both surveys and interviews, and sampled students who were currently enrolled and those who had

dropped out. Their factor analysis yielded a single index of overall fit (or "student-university match"), which significantly predicted institutional satisfaction and retention. Although this study had notable strengths, it also contained some issues that may affect the validity of its findings. The survey items were often vague; for instance, these inquired about students' perceived level of fit in relation to "anonymity," "critical debate," and "the student body" (p. 753). Moreover, given that students were asked directly about fit, the presence of a strong one-factor solution may be misleading. Dissatisfied students may have reported misfit in all domains (regardless of actual fluctuations in different aspects of fit), because their responses to the ambiguous items largely reflected their overall negative attitudes about their university experience; in other words, a negative halo effect may have been present (see Beckwith & Lehmann, 1975; Pike, 1993).

Intriguingly, the one recent study that generally avoided the preceding problems found limited support for the potential impact of student-institution fit. Mattern, Woo, Hossler, and Wyatt (2010) compared students' institutional preferences (as reported during their SAT examination) to several objective attributes of the college or university that they ultimately attended (e.g., institutional size and control), and they linked this information to students' subsequent college grades and graduation. For instance, a student who said that she only wanted to attend a same-sex school but ultimately attended a co-educational school was coded as having "misfit" on institutional gender. The study found that the relationships between fit and outcomes were often nonsignificant, modest in size, and were occasionally negative (i.e., fit with the campus location was inversely related to first-year GPA and graduation). However, this study also contained some limitations. For instance, students' ideal institutions may have changed after they took the SAT in their junior or senior year of high school. In addition, almost 100% of

students exhibited "fit" on some of the fit dimensions (which were dichotomously coded as indicating either fit or misfit), so the limited variation in these predictors made it very unlikely that significant results would be obtained.

A few studies have examined the correspondence between student and institutional religious affiliation, and these also provide mixed conclusions. Consistent with a fit perspective, attending a Catholic institution is related to greater gains in religious participation and spiritual identification among Catholic students (Bowman & Small, 2010; Hill, 2009), whereas students who identify with marginalized religions tend to have diminished spiritual growth at Christian-affiliated schools (Bowman & Small, 2010). In contrast, the correspondence between student and institutional religious affiliation is generally unrelated to changes in well-being (Bowman & Small, 2012), and a mismatch between student and institutional religious affiliation is sometimes associated with *decreases* in religious struggle (Small & Bowman, 2011). It is important to note that these studies only provide indirect evidence regarding religious fit; it is certainly possible for students to fit religiously at an institution that has a different affiliation than their own (Pérez-Peña, 2012).

Present Study

To address these limitations, we created a Student-Institution Fit Instrument (SIFI) and administered this survey at two Australian universities (Denson & Bowman, 2013). The SIFI was designed to measure several dimensions of fit that we had identified from previous research and from discussions with practitioners and researchers in the U.S. and Australia. Within the Australian data, we found that these fit dimensions were positively related to one another and could be combined into a single, internally reliable fit index. This overall fit measure predicted academic adjustment and disengagement, which in turn predicted students' intentions to persist

at that institution and to change majors and career choices. This instrument contains a number of improvements over previous research. First, consistent with Pervin's (1967) approach, it assesses students' perceptions of their current institution and their ideal institution separately, which helps ensure that perceived misfit does not merely reflect low college satisfaction. Second, students can exhibit "misfit" in both directions (e.g., a student can feel that the institution is either too religious or not religious enough), so these indicators do not simply reflect exposure to positive college environments. Taken together, these two features of the questionnaire would seem to reduce halo error, which generally operates via the formation of global impressions that lead to biased ratings of specific items. However, with the current approach, students are not asked to make any judgments about the extent to which the college environment is positive or negative; instead, students are reporting on specific features of their institutional environment (e.g., salience of athletic culture) and then subsequently reporting what they would like in an ideal institution. Thus, misfit is gauged through the extent of the difference between current and ideal environments, not through a single report of whether students feel that they fit (or not). Third, the fit items use specific, concrete language so as to yield more accurate student reports (Bradburn, Sudman, & Wansink, 2004; Dillman, Smyth, & Christian, 2009). This specificity in language—and therefore detailed knowledge about the environmental mismatch—could also help institutions designed targeted and meaningful interventions.

In the present study, we examined the factor structure, internal reliability, and predictive validity of the SIFI in the United States. To maximize the generalizability of our findings, we intentionally sampled students from two institutions that differ in terms of size, control, type, region, and religious affiliation. We explored the following hypotheses: (1) the SIFI will yield eight internally reliable dimensions of student-institution fit; (2) these dimensions can be

combined into a second-order factor of overall fit; (3) the factor loadings will be similar across the two institutions; (4) fit will significantly predict social and academic outcomes; and (5) fit will have a positive, indirect effect on intent to persist.

Method

Data Source and Participants

Participants were undergraduates enrolled at two institutions: a large, public doctoral university in the Midwest (with approximately 17,000 students) and a very small, religiously affiliated liberal arts college in the South (with fewer than 1,000 students). These schools were selected for their notable divergence on these institutional attributes, but they were similar in the academic preparation of incoming first-year students (median ACT composite scores of approximately 22-23). Participants at the doctoral university were recruited through the psychology subject pool, and 409 students completed the survey online. Participants at the liberal arts college were recruited in several general education courses and were asked to complete the paper-and-pencil version of this survey (along with other surveys) as part of a campus assessment; 99 students participated in this study. The institutional samples differed notably in their representation of students of color (19.6% at the doctoral university, 34.3% at the liberal arts college) and male students (23.7% at the doctoral university, 52.5% at the liberal arts college). With the exception of gender at the doctoral university, the race/ethnicity and gender of these samples were fairly similar to the undergraduate populations at the respective institutions (among all undergraduates at the doctoral university, 44% of students are male and 20% are students of color; at the liberal arts college, 49% are male and 29% are students of color).[1] The sampling procedures were intentionally designed to yield large proportions of students who were early in their undergraduate career, because student attrition could lead to range restriction on

student-institution fit and/or the outcome variables. As intended, the vast majority of participants were in their first or second year of college (71.0% at the doctoral university and 90.9% at the liberal arts college). These surveys were administered in the Spring semester so that participants would have had sufficient time on campus to become familiar with their institutional environment.

Measures

The SIFI was developed in several phases. First, we reviewed the existing literature on student-institution fit to identify dimensions that had been used in previous research. Second, we had discussions with student affairs practitioners and higher education researchers in the United States and Australia about dimensions of potential misfit that may contribute to student attrition. Third, we decided upon several fit dimensions and wrote questionnaire items that were designed to assess these dimensions. Fourth, we conducted pretesting on a preliminary version of the SIFI with U.S. undergraduates and higher education doctoral students; this process yielded support for the face validity of the instrument, and we incorporated feedback regarding the items and response scales into a revised version. Fifth, we made some modest language changes in the U.S. version to tailor the survey for Australian students (e.g., the language describing political orientation varies across these two countries). We also removed the athletic fit items from the Australian version, since Australian intercollegiate athletic teams are uncommon and certainly do not shape institutional culture to the extent that they sometimes do in the United States. Sixth, we administered this instrument at two Australian universities; as described earlier, the findings provided support for the reliability, factor structure, and predictive validity within these samples (Denson & Bowman, 2013).

The U.S. version of the SIFI included eight domains of student-institution fit: academic, social, cultural, physical, athletic, religious, socioeconomic, and political. The academic environment was assessed via a four-item scale pertaining to academic challenge (e.g., "Students have to work hard to get good grades"). A two-item scale was used to indicate the social environment, particularly the partying culture of the university (e.g., "Students at this university like to party"). The cultural environment was represented by a four-item scale about the diversity climate on campus (e.g., "This institution promotes the appreciation of individual differences"). The physical environment was measured with three items regarding the location of the institution (e.g., "This university is within driving distance from at least one of my parents"). Athletic environment was indicated by four items regarding the salience and success of athletic teams (e.g., "Students generally attend athletic events"). The religious environment was operationalized using a five-item scale about the prominence of religiosity on campus (e.g., "Religion plays a major role in most students' lives"). The socioeconomic environment refers to the degree of wealth/materialism among the student body, which was measured with three items (e.g., "Most students at this institution are from high socioeconomic backgrounds"). Lastly, a four-item scale indicated the political environment via the political orientation of students and faculty (e.g., "Faculty at this institution have liberal political beliefs").

For each item, we asked students to rate to what extent each item is an attribute of (a) the attributes that their institution (or students as a whole) actually possesses, and (b) their desired attributes of an ideal institution. Students responded to each item using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaire asked all of the current institution items and then all of the ideal institution items, which made the task less cognitively taxing (i.e., students only had to think about one institutional context at a time) and

also made it difficult for students to artificially inflate or deflate their fit responses (on the online survey, when students started answering the ideal university items, they were not allowed to view or change their responses for their current institution). In other words, the structure of the questionnaire forced students to consider their current and their ideal institutions separately in an effort to reduce halo error and ultimately provide a more accurate determination of fit. Student "misfit" was calculated by taking the absolute value of the difference between responses for the desired attribute of an ideal university and the actual attribute of their current institution. By calculating the absolute value of the difference between the two scores, we did not make a value judgment regarding the direction of misfit. Thus, larger difference scores (for the absolute value) represent greater "misfit", with smaller difference scores representing greater "fit". We then reverse-coded the fit indices so that higher values represent better fit, with lower values representing misfit.

To ensure that the potential effects of fit are independent of students' friendships, we also asked five items about the quality of students' university friendship groups, such as the degree to which they feel they have a supportive group of friends, high degree of emotional connection, and friends they can rely on in time of need (1 = strongly disagree to 7 = strongly agree, $\alpha = .93$).

We used three "proximal" outcome variables and one primary or distal outcome variable. Overall college satisfaction was assessed with three items, such as rating the "overall college experience" (1 = very dissatisfied to 7 = very satisfied, $\alpha = .71$). Four items were used to measure social isolation; these included the frequency of feeling "lonely or homesick" and "isolated from campus life" (1 = never to 7 = daily, $\alpha = .67$). Academic adjustment was indicated with a four-item index regarding how easy it was to "develop effective study skills" and "manage your time effectively" (1 = very difficult to 7 = very easy, $\alpha = .82$). We also asked four

academic disengagement items that were also administered in the Australian study, but these had a low internal reliability in the current sample ($\alpha = .52$) and were therefore not included in the analyses. The primary dependent variable was a single-item outcome regarding the likelihood that a student would graduate from this university (1 = no chance to 5 = very good chance). Finally, we also included the following three control variables: gender (1 = female; 2 = male), race/ethnicity (1 = White; 2 = student of color), and year in college (1 = freshman, to 4 = senior). Table 1 presents the descriptive statistics and reliabilities for each of the measures.

Analyses

We employed structural equation modeling (SEM) to examine the relationships between the predictor variables (student-institution fit and quality of college friendship groups) and the outcome variables (college satisfaction, social isolation, academic adjustment, and intent to persist). The structural equation model consisted of two parts: a measurement model and a structural model. The measurement model represents the portion of the model that includes the hypothesized relationships between the latent (unobserved) fit constructs and their indicator (observed) variables. The structural model is the portion of the model that includes the hypothesized relationships between the predictor variables and outcome variables. SEM provides standardized path estimates that indicate the strength of the relationship between two latent variables if they were assessed without measurement error (for more detailed information on SEM, see Kline, 2010; Raykov & Marcoulides, 2006).

First, we tested the measurement model using confirmatory factor analysis (CFA) to examine whether the indicator variables represented their latent constructs for the fit dimensions. We also tested whether these fit dimensions can be combined into a second-order factor of overall fit. Second, we conducted factorial invariance testing of the measurement model (for both

the first-order factor model and the second-order factor model) to test whether the factor loadings were similar across the two institutions. Lastly, we tested the structural model of the hypothesized relationships among the predictors and the outcomes. Within the structural model, we examined the extent to which (a) fit and friendships predict the three proximal outcomes (i.e., college satisfaction, social isolation, and academic adjustment), (b) these proximal outcomes predict intent to persist, and (c) fit and friendships have significant, indirect effects on intent to persist. Modeling intent to persist as a distal outcome is consistent with influential theories of student departure (e.g., Bean & Eaton, 2000; Tinto, 1993), and behavioral intentions are also considered an immediate precursor to behavior within Ajzen's (1991) widely used Theory of Planned Behavior. Bean and Eaton further proposed that environmental interactions contribute to psychological and attitudinal outcomes, which then contribute to intent to persist; this framework is quite consistent with the current statistical model as well as emerging research (e.g., Johnson, Wasserman, Yildirim, & Yonai, in press). The structural analyses also included a correlational path between fit and friendships as well as correlational paths among the disturbances (i.e., error terms) for the three proximal outcomes (the latter paths account for the relationships among the proximal outcomes, since correlational paths cannot be modeled among latent outcome variables in an SEM analysis).

While parsimony is a priority in selecting variables for structural equation modeling, we also wanted to reduce the possibility of omitted variable bias. As a result, we included gender and race as control variables predicting all proximal and distal outcomes. Moreover, it seemed likely that students who had stayed longer at the university would be more likely to graduate, so we included year in college as an additional predictor of intent to persist. We also conducted sensitivity analyses in which we only included students who were in the first two years of

college, since their perceptions of fit and intent to persist may be different from those of more advanced students. The results of our sensitivity analyses showed that most of the constructs (including fit) did not differ significantly by year and that the main findings were similar to those for the full sample. Therefore, we only present the results for the full sample.

For the CFA, factorial invariance testing, and structural analyses, we used the following goodness-of-fit indices to assess absolute model fit (Tabachnick & Fidell, 2007): the Non-Normed Fit Index (NNFI) or Tucker Lewis Index (TLI), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). Generally, NNFI, TLI and CLI values of at least .95 and RMSEA values of no more than .06 reflect relatively good fit to the data (e.g., Hu & Bentler, 1999). For the factorial invariance testing, we utilized the Satorra-Bentler scaled chi-square difference test (Satorra & Bentler, 2001). We also used the following criteria to assess incremental model fit for equivalence across groups: a change of no more than .01 in the CFI (Cheung & Rensvold, 2002) and a change of no more than .01 in the RMSEA (Chen, 2007). To account for the non-normality of some variables, we utilized the WLSMV and WLSM (for nested model testing) estimators within the MPlus Version 7.11 software for the analyses (Muthén & Muthén, 2012).

Limitations

Some limitations should be noted. First, this study only includes students from two institutions, and participants were not randomly sampled from these two schools, so it is unclear to what extent these findings might be replicated with other samples. The selection of two very different institutions, along with the results of the factorial invariance analyses (described below), provides some modest evidence that these results may be generalizable. Second, the cross-sectional nature of this data is also less than ideal. This approach does not allow us to

examine whether, for example, student-institution fit predicts changes in college satisfaction. Instead, the directionality of the relationships in the models reflects both prevailing theory and the empirical results that we obtained. Another potential concern is that students' views of which institutional attributes are desirable may have changed since they first entered the institution. As a result, the findings only reflect students' present level of fit. Third, while students reported their intent to persist until graduation, we do not have data on students' actual retention or persistence. The correspondence between intent to persist and actual persistence is reasonably strong; for instance, several structural equation modeling analyses have yielded standardized beta coefficients of .35 to .70 for intent to persist predicting persistence when controlling for other variables (Hausmann et al., 2009; Johnson et al., in press).

Results and Discussion

Confirmatory Factor Analyses Examining Fit Dimensions

The initial confirmatory factor analysis examined the items as representing eight latent fit dimensions with correlations among all eight constructs. However, the cultural (diversity) factor did not have sufficient reliability ($\alpha = .53$), so the diversity items and corresponding latent construct were removed from the analysis. The data fit the seven-factor measurement model well (χ^2 [254, $N = 499$] = 412.24, $p < .001$; $\chi^2/df = 1.62$; CFI = .972; TLI = .967; and RMSEA = .035). The standardized factor loadings for all items ranged from .50 to .95 (mean loading = .68 and median loading = .63); all factor loadings except for two exceeded the cutoff for "good" loadings, and most of them would be considered "very good" or "excellent" (Tabachnick & Fidell, 2007).

The internal reliabilities for the fit dimensions were mixed: these included religious ($\alpha = .81$), athletic ($\alpha = .72$), academic ($\alpha = .63$), socioeconomic ($\alpha = .64$), political ($\alpha = .87$), physical

(α = .65), and social (α = .85). It is important to remember that each student-institution fit "item" used in these factors consists of the absolute value of the difference between two survey items (i.e., the perception of one's current institution and the characteristics of one's ideal institution). Given that a single fit item therefore contains error from both of those two original survey items, Cronbach's alphas from .60 to .69 seem less "questionable" than conventional standards might suggest. In addition, in many cases, Cronbach's alpha is actually the lower-bound estimate of the true reliability (Lord & Novick, 1968). The correlations among the fit dimensions were strong or moderate ($.30 < r < .65$, mean $r = .45$, median $r = .42$).

We then examined whether the student-institution fit dimensions could be combined into a second-order factor for overall fit. Although this new model is more parsimonious than the previous one, the goodness-of-fit indices were still very similar to the original measurement model (χ^2 [268, $N = 499$] =461.11, $p < .001$; χ^2/df = 1.72; CFI = .966; TLI = .962; and RMSEA = .038). The loadings for the second-order factors range from .56 to .72, and the internal reliability of this overall fit index is good (α = .85). The loadings for each item onto its latent fit dimension are virtually identical to those in the initial model. Thus, it appears that student-institution fit can be conceptualized as a single construct that is comprised of several interrelated dimensions or subscales. As a result, this second-order factor was used in subsequent analyses.

Factorial Invariance Analyses

The initial factorial invariance analyses examined the seven-factor measurement model. While the physical location factor did have sufficient reliability, it was not invariant across institutions, so we removed the physical location items and corresponding latent construct from subsequent analyses. Moreover, removing the physical location items and corresponding latent factor also makes sense conceptually when considering the physical location of the two

institutions. Relative to the university, the liberal arts college is much farther away from a major city (or even a large town), and a much greater percentage of students are from out of state. Thus, the institutions' locations—whether considered more generally or relative to students' hometowns—differ in important ways, which likely contributed to the factorial variance.

Figure 1 contains the detailed results for the CFA. Table 2 presents the factorial invariance testing on the six-factor measurement model across the two institutions, which compares the fit indices for the completely free model (Model 1), a model with invariant first-order factor loadings (Model 2), and a model with invariant first-order and second-order factor loadings (Model 3). The goodness-of-fit indices for all three models demonstrate good fit. The nested model comparisons using chi-square difference testing between Model 1 and Model 2 is significant, suggesting cross-institutional non-equivalence in the SIFI across the two institutions. However, chi-square is affected by sample size, with larger samples producing larger chi-square values that are more likely to be significant (Cheung & Rensvold, 2002). With large samples, even a small chi-square difference may result in a significant difference, rejecting invariance when the difference is trivial (Kelloway, 1995). Using CFI and RMSEA, the nested model comparisons show that the difference between Model 1 and Model 3 was .010 for the CFI, and it was only .002 for the RMSEA. Because neither of these changes is greater than .01, these invariance analyses demonstrate sufficient cross-institutional equivalence in the meaning of the higher-order SIFI across the two institutions. As a result, this second-order factor was used in the structural analysis.

Structural Model Predicting Student Outcomes

The goodness-of-fit indices for the structural model were excellent (χ^2 [752, N = 493] = 999.744, $p < .001$; χ^2/df = 1.33; CFI = .992; TLI = .992; and RMSEA = .026). The complete

results are shown in Table 3, and Figure 2 provides an overview of the primary direct and correlational paths (excluding the control variables). As expected, student-institution fit is positively related to college satisfaction, which is consistent with previous studies that used divergent approaches for measuring fit (Gilbreath et al., 2011; Wiese, 1994; Wintre et al., 2008). The link between fit and academic adjustment is nonsignificant, which diverges from our Australian findings (Denson & Bowman, 2013). Of the six dimensions that comprise overall fit, one dimension is entirely concerned with academic fit, and two others partially involve fit with faculty perspectives (political and religious). Supplementary analyses that examine each fit dimension separately show that academic adjustment is positively correlated with academic fit, but not with any of the other fit dimensions. Thus, fit may play some role in academic adjustment, but this relationship is limited to the academic aspects of fit. Student-institution fit is also negatively related to social isolation, meaning that students who fit better within their institution are less likely to be socially isolated from their peers and from campus life.

Student friendships are positively associated with college satisfaction and academic adjustment, and they are negatively related to social isolation. The magnitude of the link between friendships and satisfaction is quite strong, which implies that the formation of friendship groups may play a substantial role in shaping students' overall college satisfaction. The link between student friendships and social isolation seems quite logical; the fact that this relationship is much weaker than for satisfaction suggests that a complex set of factors—most of which are not measured in this study—likely contribute to feelings of isolation. The positive association between friendships and academic adjustment also makes sense, because these peer relationships may be helpful in acclimating to the challenges and expectations of college coursework. Perhaps surprisingly, fit and friendships are not significantly correlated; supplementary analyses further

indicate that friendship is not significantly correlated with any of the six fit dimensions. It seems that student-institution fit may influence students' overall social integration (as suggested by the significant relationships with social isolation and college satisfaction), but fit is unrelated to the formation of close campus friendships. This finding illustrates the important distinction between fitting within the broader college environment versus connecting with a close-knit peer group on campus.

As expected, college satisfaction is positively related to intent to persist, and social isolation is negatively associated with intent to persist. Academic adjustment, however, was unrelated to intent to persist. Both student-institution fit and peer relationships have significant, indirect effects on intent to persist. The results also indicated that adding direct paths from fit or friendships to intent to persist would not improve the model fit, so the relationship between fit and intent to persist is fully explained by these proximal outcomes. The indirect effect is consistent with Tinto's (1993) conceptualization of student-institution fit as a precursor to social and/or academic integration, whereas it does not appear to support the view that fit has a direct effect on intent to persist (Bean & Eaton, 2000). However, this seeming inconsistency may stem from different ideas of what constitutes "fit." In Bean and Eaton's model, fit is a conscious attitude that students hold as the result of significant interactions with their environment, and this perception of (mis)fit then directly influences their intentions to stay or depart from the institution. This conceptualization is congruent with Wintre et al.'s (2008) methodology in which they directly asked students the extent to which they "match" various aspects of the institutional environment. Tinto also views fit as a student perception to some degree, but this perception then affects students' interest and ability to become integrated with social and academic aspects of institutional environment.

Conclusion and Implications

The present study provides support for the internal reliability, factorial invariance, and predictive validity of a new Student-Institution Fit Instrument (SIFI). Specifically, the survey results yielded several interrelated dimensions of fit, which can be combined into an internally reliable index of overall fit. Moreover, the six-factor fit structure is similar within the two disparate institutions included in this sample. Even when controlling for student friendships and demographics, overall student-institution fit is associated with greater college satisfaction and lower social isolation, and fit is indirectly and positively related to intent to persist. Importantly, these findings occurred despite the fact that the SIFI was designed to reduce methodological issues in earlier research that may have yielded overly favorable results. Thus, this study provided a more rigorous test of the link between fit and desired outcomes.

These findings have significant implications for higher education practice. In an era of greater tuition dependence, colleges and universities may be tempted to appeal to all possible students so that they can increase—or simply even maintain—their enrollments. By doing so, institutions may not choose to emphasize their unique character or attributes that differentiate them from their competitors. As a result, some students who would be strongly drawn to that institution might choose to go elsewhere, and other students may ultimately attend that school even though they do not fit well with the institutional environment. Both students and institutions benefit from a greater transparency about institutional attributes: Students will be more likely to select schools in which they will thrive, and institutions may have greater retention and a stronger institutional character, which is also associated with learning and persistence (Kuh, Kinzie, Schuh, Whitt, & Associates, 2005). Resources to help determine fit are currently available or being developed; in perhaps the most well-known example, The Princeton Review

(2013) has a long-standing set of rankings that address aspects of campus life ranging from LGBT-friendliness to alcohol and drug use.

Higher education practitioners and administrators should be sensitive to potential misfit on their campus. Clearly, campus environments are not—and should not be—completely homogeneous. At the institutional level, institutions should work to identify the most salient aspects of misfit within their particular contexts and provide opportunities for students who might not fit with the broader campus norms. For instance, campuses with a strong Christian presence should consider how they can support organizations for non-Christian students, which might include a Hillel, a secular student society, and other groups. The flourishing of these "alternative" organizations need not diminish or detract from the broader campus culture; instead, dialogues about religious pluralism could provide fruitful opportunities for student growth and inclusion while still valuing religious and spiritual expression.

Institutional researchers can use the SIFI to offer campus-level insights and recommendations for improvement. The present study examined the predictive validity of overall fit, but institutions may be interested in whether students exhibit particularly strong misfit on one dimension and whether that misfit occurs systematically in a single direction. For example, if a large number of students report not experiencing enough academic challenge, then a college or university may consider promoting honors programs, learning communities, and/or other approaches for providing additional challenge within and outside of the classroom. SIFI data could also be useful for exploring potential disparities across student subgroups; for example, students from lower-income families may be more likely than other students to report socioeconomic misfit (or possibly greater misfit overall), and this misfit may at least partially mediate the relationship between demographics and student success. Such findings can help

facilitate a better understanding of adjustment issues for historically underrepresented groups, which can lead to targeted interventions.

Moreover, institutions could use the SIFI as an early monitoring system to identify students who may be considering dropping out. Institutional researchers could administer the SIFI (and probably other measures) to students during their first semester to identify individuals who exhibit substantial misfit. For example, if a student is identified as having greater academic misfit, then the student could be encouraged to speak with an academic advisor. Perhaps the academic misfit stems from the student's current courses and/or major, and the advisor might encourage the student to enroll in different courses or consider pursuing another major that may be a better fit for them. In a similar vein, institutions could also follow more closely students who may be at a higher risk for dropping out (e.g., first-generation college students) and target those students as early as possible. Thus, the SIFI can also be used as a formative assessment tool in order to identify the areas of concern for individual students and students at increased risk that can be tracked over time.

While the results of the current study are promising, future research and assessment is needed on the SIFI specifically and student-institution fit more generally. Longitudinal research is needed to determine whether fit predicts *changes* in adjustment, satisfaction, and achievement as well as subsequent student retention. Employing a larger sample (in terms of both the number of students and schools) would be helpful for examining the generalizability of these findings as well as the role that institutional attributes might play in this process. As Gilbreath et al. (2011) has noted, a handful of disconnected studies have begun to yield insights into student-institution fit, but a more concerted and coherent effort is necessary so that fit may contribute significantly to understanding the student departure puzzle.

Note

[1] Institutional data for race/ethnicity and gender were obtained from the National Center for Education Statistics. These data included a category for "non-resident aliens" that is mutually exclusive from the other racial/ethnic groups, but our study did not include such a category. Given the countries of origin of most international students, it is reasonable to assume that the vast majority of international students are not White/Caucasian (see Institute of International Education, 2012). Therefore, students of color were defined as anyone who reported membership in a "racial/ethnic" group other than White/Caucasian, which includes non-resident aliens for the institutional data.

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Table 1. Descriptive statistics for the overall sample

Variable (range)	Mean	SD	Cronbach's alpha
Student-institution fit (0-6)	4.99	.57	.85
Religious (0-6)	4.95	.82	.81
Religion is highly visible on campus (V1)			
Most students are practicing Christians (V2)			
Religion plays little or no role in most students' lives (V3)			
Students at this institution are religious (V4)			
Religion plays a major role in most students' lives (V5)			
Athletic (0-6)	4.84	.88	.72
Students generally attend campus athletic events (V6)			
This institution values its sports teams (V7)			
Students at this university have no interest in the athletic teams and events (V8)			
This institution has good athletic teams (V9)			
Academic (0-6)	5.05	.71	.63
Courses require a great deal of effort (V10)			
Most courses are challenging (V11)			
Instructors generally give high grades (V12)			
Students have to work hard to get good grades (V13)			
Socioeconomic (0-6)	5.19	.71	.64
Most students are from wealthy families (V14)			
Most students at this institution are from low socioeconomic backgrounds (V15)			
Most students at this institution are from high socioeconomic backgrounds (V16)			
Political (0-6)	5.06	1.05	.87
Most students are politically liberal (V17)			
Faculty generally have conservative political beliefs (V18)			
Most students endorse conservative values (V19)			
Faculty at this institution have liberal political beliefs (V20)			
Social (0-6)	4.78	1.32	.85
Most students drink frequently (V21)			
Students at this university like to party (V22)			
Student friendships (1-7)	5.53	1.49	.93
I have developed close friendships with other students at this university			
I have friends at this university that I could rely on in a time of need			
I have a supportive group of friends at this university			
I have friends at this university who I study with on a regular basis			
I have friends at this university who I hang out with on a regular basis			
College satisfaction (1-7)	5.53	.91	.71
Overall college experience			

Overall quality of instruction			
Overall sense of community among students			
Academic adjustment (1-7)	4.61	1.17	.67
Understand what your professors expect of you academically			
Develop effective study skills			
Manage your time effectively			
Adjust to the academic demands of the university			
Social isolation (1-7)	2.26	1.06	.82
Lonely or homesick			
Worried about your health			
Isolated from campus life			
Unsafe on this campus			
Intent to persist (1-5)	4.47	.99	N/A
Graduate from this university			

Note. The student-institution fit values are based on the final six-factor model. The variable labels (e.g., V1) correspond with those presented in Figure 1.

Table 2. Tests of factorial invariance across the two institutional samples

Model	χ^2	df	$\Delta\chi^2$	CFI	TLI	RMSEA
Completely free	599.514	388	-	.980	.977	.047
Invariant first-order factor loadings	862.980	515	241.642***	.968	.971	.052
Invariant first-order and second-order factor loadings	862.599	539	28.430	.970	.974	.049

Note. χ^2 = chi-square; *df* = degrees of freedom; $\Delta\chi^2$ = chi-square difference test; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation. ***$p < .001$

Table 3. Standardized coefficients for direct and indirect effects for the structural model

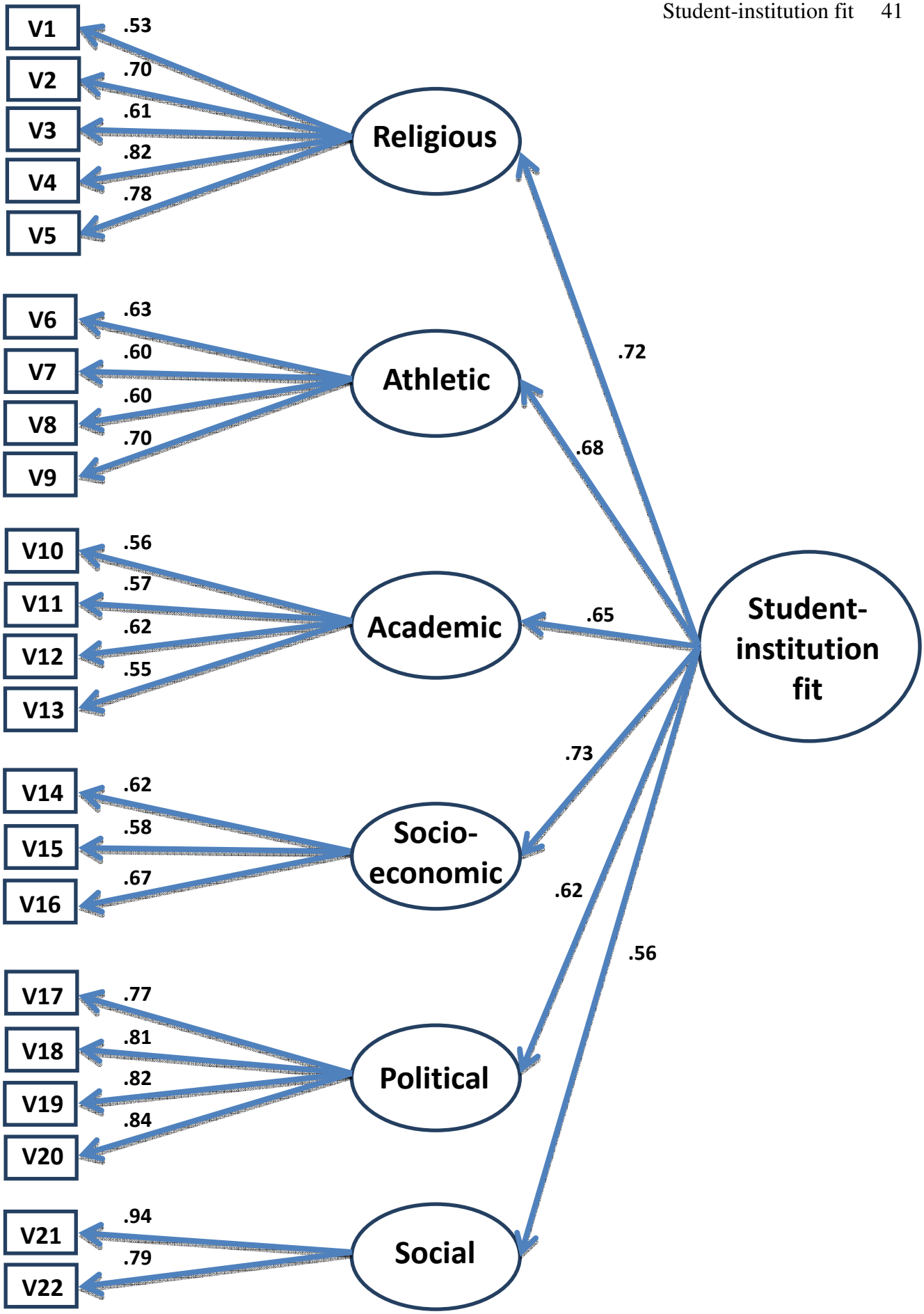
	Beta	*sig*
Direct effects on:		
Intent to persist		
College satisfaction	.449	***
Academic adjustment	.089	
Social isolation	-.163	*
Male	-.105	
Student of color	-.121	*
Year in college	.387	***
College satisfaction		
Student-institution fit	.158	***
Student friendships	.689	***
Male	-.116	*
Student of color	-.045	
Academic adjustment		
Student-institution fit	-.059	
Student friendships	.140	**
Male	-.059	
Student of color	-.041	
Social isolation		
Student-institution fit	-.146	*
Student friendships	-.167	**
Male	-.319	***
Student of color	.035	
Indirect effects on:		
Intent to persist		
Student-institution fit	.089	**
Student friendships	.349	***
Male	-.005	
Student of color	-.030	

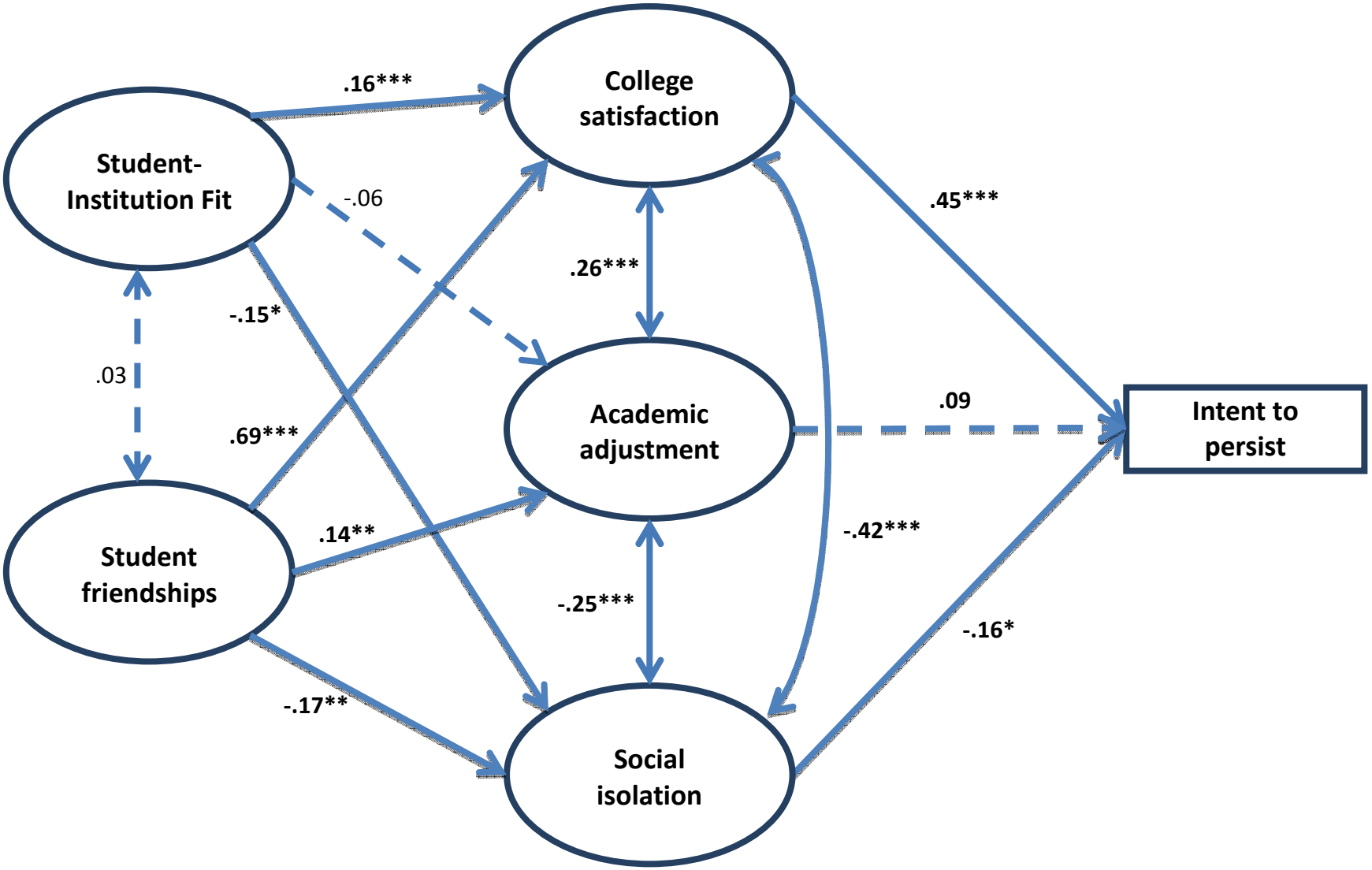
*$p < .05$ **$p < .01$ ***$p < .001$

Figure Captions

Figure 1. Measurement model of student-institution fit as a second-order factor

Figure 2. Structural model of student-institution fit and friendships predicting student outcomes


V1
V2
V3
V4
V5
.53
.70
.61
.82
.78
Religious
V6
V7
V8
V9
.63
.60
.60
.70
Athletic
V10
V11
V12
V13
.56
.57
.62
.55
Academic
V14
V15
V16
.62
.58
.67
Socio-economic
V17
V18
V19
V20
.77
.81
.82
.84
Political
V21
V22
.94
.79
Social
.72
.68
.65
.73
.62
.56
Student-institution fit



Note: All reported values are standardized coefficients. Dashed lines represent non-significant findings. For simplicity of presentation, the control variables and their corresponding paths are not shown in this figure (see Table 3 for complete results).
χ^2 (752, N = 493) = 999.744, $p < .001$; χ^2/df = 1.33; CFI = .992; TLI = .992; RMSEA = .026. *$p < .05$ **$p < .01$ ***$p < .001$