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**Examining the Effect of Advisor-Student Relationships on Academic Major Decision-Making**

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**Examining the Effect of Advisor-Student Relationships on Academic  
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**by**

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# **Examining the Effect of Advisor-Student Relationships on Academic Major Decision-Making**

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Given extensive research highlighting the benefits of need-supportive practices and need satisfaction, it seems likely that academic advisors who use practices found to be need-supportive in classroom, work, and other contexts, will foster students' perceived autonomy and competence toward the academic major decision-making process and facilitate longer-term goals of enhancing motivation and satisfaction with their academic coursework. A longitudinal study was conducted in order to examine the stability in perceptions of college students' academic major decision-making experience over time as a function of need-supportive advising. The study also examined the stability in satisfaction and motivation outcomes as a function of need-supportive advising over time. Participants included undecided students who completed an online survey at three time points during either the 2012-2013 or 2013-2014 academic year. The online survey included measures assessing perceptions of advisors' needs-supportive practices, students' autonomous and competent decision-making, satisfaction with and motivation for coursework, and subjective well-being, as well as demographic characteristics. Analyses on several models were performed using Mplus version 6.12. Results suggest need-

supportive advising at the beginning of the academic year predicts improved academic satisfaction, academic efficacy, subjective well-being, and value toward coursework toward the end of the academic year particularly when advising sessions satisfy students need for competence throughout the year which, in turn, provides students with increased competence about choosing an academic major. Implications and future directions are discussed.

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## **Chapter 1: Introduction**

Over the past decade (2001-2011), college tuition and fee costs have increased an average rate per year of 5.6%, adjusting for general inflation, while undergraduate students receiving federal loans has increased to 34% (College Board 2011a, 2011b). These rising costs coupled with students' rising debt suggest that timely degree completion is important. However, inevitably, some students do not obtain a college degree in the traditional four year period, or at all, despite having invested a great number of resources in pursuit of that goal (e.g., Hochstein & Butler, 1983; Knight & Arnold, 2000; Stampen & Cabrera, 1988).

Academic advising has been suggested to be one promising way to address the problem of retaining students in college through graduation, supporting students' persistence in obtaining a degree and engagement in college coursework (Pascarella & Terenzini, 1991). In fact, advocates have asserted and research has supported the proposition that academic advising may be the most influential service provided to students attending 4-year public universities in the United States (Cuseo, 2003; Noel-Levitz, 2011).

Going further, "undecided" or "undeclared" students, those who have yet to choose a major when they enter college, are particularly less likely to persist to their second year (Leppel, 2002) or their second semester (St. John, Hu, Simmons, Carter, & Weber, 2004). Additionally, undecided students reported lower grade point averages (GPAs) than students who had chosen majors (Anderson, Creamer, & Cross, 1989). Undecided students tend to exhibit low efficacy toward decision-making (Taylor & Betz, 1983), when compared to decided students. Chase and Keene (1981) found students who choose a major earlier reported higher GPAs and enrolled in more courses than those who remained undecided over a greater number of semesters. Similarly, in a study using first-year students, Foote (1980) found undecided students completed fewer courses and had lower GPAs than decided students. As such, academic advising may be particularly important for students who enter college without having chosen an academic major.

Though first-year students vary in their level of undecidedness, most are still evolving into critical thinkers and developing decision-making skills (Baird, 1967; Gordon, 2007; Titley & Titley, 1980). Personal/social factors may play a role in students' undecidedness, as well as information or decision-making skill deficits (Gordon, 2007). However, aside from these factors that influence students' undecidedness and thus, other academic outcomes, academic advisors have the potential to play a significant role in helping undecided students initiate and successfully navigate the major exploration process. Specifically, advisors may assist students in understanding themselves, educational programs and curricula, occupations, and decision-making. Advisors can use a number of strategies to assess and inform these areas through the use of formal assessments, programming events, and, most commonly, one-on-one advising sessions (Gordon, 1992; Slowinski & Hammock, 2003) in which a personal relationship is allowed to develop between the advisor and student, and advisors are able to show a genuine interest in students and their needs (Fox, 2008). Currently, no research has examined the influence of advising on academic major decision-making. However, considering the skills and knowledge academic advisors possess, undecided students may benefit from advising sessions throughout the decision-making process.

Schulenberg and Lindhorst (2010) suggest that, in general, advising should focus on the following objectives: “engaging students in reflective conversation about educational goals; teaching students about the nature of higher education, academic decisions, and the significance of those decisions; and encouraging student change toward greater levels of self-awareness and responsibility” (p. 27). Nevertheless, not all advising is equally effective in supporting students' college and career goals. Previous research on academic advising has produced mixed results related to the effect of advising on retention (e.g., Braxton, Duster, & Pascarella, 1988; Brigman, Kuh & Stager, 1982; Steele, 1978). For example, students' perceptions of their advisors as helpful did not impact students' satisfaction with or commitment to their university which were both found to influence retention (Bean, 1980). Conversely, in a longitudinal study, Braxton and

colleagues (1988) found initial institutional commitment positively contributed to increased engagement with academic advising. This, in turn, influenced enhanced academic performance which indirectly impacted future enrollment through subsequent institutional commitment. Thus, it seems important for research to focus on how the benefits of advising can be maximized to support students' college and career outcomes.

The parallel between effective teaching and effective advising has long been discussed (e.g., Crookston, 1972; C. Ryan, 1992), the main teaching goal of advising sessions being to increase students' knowledge about academic programs, as well as to foster their academic decision-making and problem-solving skills (Hemwall & Trachte, 1999; Laff, 1994; C. Ryan, 1992). Advisors and students should enter their sessions prepared; advisors should demonstrate mastery over degree plan requirements and university policies; students should be actively engaged in learning during these sessions; advisors should be enthusiastic when relaying this information; and advisors should provide timely constructive feedback during their sessions (C. Ryan, 1992). These suggestions closely align with exemplary teaching practices. Additionally, comparisons between advising and counseling have been discussed (Kuhn, Gordon, & Webber, 2006; Shane, 1981). Shane (1981) provides that advising can be considered "therapeutic" to the extent that "advising deals with values, commitment, and emotional preferences rather than with logical options or with rational educational strategies" (p. 21). While advising tends to focus on academic concerns, such as course selection, registration, and degree requirements, advisors do assist students with decision-making, as well as discuss personal, career, and academic goals; all topics which are commonly discussed in counseling sessions (Kuhn et al., 2006). Advising and counseling (or psychotherapy) overlap in that the outcome of both is personal fulfillment (Kuhn et al., 2006) through a change process (Ryan, Lynch, Vansteenkiste, & Deci, 2011).

The similarities between teaching and advising, as well as counseling and advising, suggest that many of the practices that research has identified as facilitating adaptive outcomes may also be effective in the context of the advisor-student relationship. That is, research



examining environmental support for motivation, well-being, and performance may provide a guide for understanding what type of academic advising may lead to the greatest benefits for students. Self-determination theory has suggested that environmental support for basic psychological needs for autonomy, competence, and relatedness leads to variety of psychological benefits across contexts, but particularly in classroom settings (e.g., deCharms, 1976; Grolnick & Ryan, 1987, Guay, Ratelle, & Chanal, 2008) as well for parenting (e.g., Chirkov & Ryan, 2001), workplace management (Hardré & Reeve, 2009), sports coaching (e.g., Allen & Howe, 1998), and therapy or counseling in clinical settings (Williams et al., 2006a; Williams et al., 2006b). Specifically, need-supportive practices have influenced enhanced engagement (e.g., Guay, Ratelle, Chanal, 2008; Skinner & Belmont, 1993), positive well-being (e.g., Kasser & Ryan, 1999; Patrick, Skinner, & Connell, 1993), and improved achievement (e.g., Farkas & Grolnick, 2010; Jang, Kim, & Reeve, 2012; Ratelle, Larose, Guay, & Senécal, 2005), to name a few.

In light of the extensive literature highlighting the benefits of psychological need-support in both educational and other practical contexts, it stands to reason that students will benefit from need-supportive advising experiences. That is, it seems likely that the extent to which an advisor engages in practices marked by support for the student's needs for autonomy, competence, and relatedness has the potential to enhance perceptions of autonomy and competence in making academic choices and aspects of the student's motivation toward learning. The present study sought to explore this question and add to the growing body of literature examining self-determination theory variables in educational contexts outside the classroom. Despite the apparent benefits of psychological need support in a variety of contexts, research has neglected to investigate whether academic advising may enhance the students' outcomes more when it supports psychological needs to a greater extent. From a practical standpoint, these findings could also be used to advance advisor training. Advisors can gain additional techniques that they may utilize during one-on-one sessions. As Hagen and Jordan (2008) recommended, advisors should use several different theories to aid in their practice. In line with this recommendation,

this study represents an extension of existing theory on effective advising and applies a well-established theory of motivation and human functioning, self-determination theory, in order to provide a more nuanced understanding of how advising practices can lead to the greatest benefits for students. All in all, the current study provides greater insight into decision-making behaviors of college students to foster retention and timely degree completion, particularly for those who enter college without having decided on a major.

To explore the relations of need-supportive advising with students' academic outcomes, the present study focused on the advising perceptions of undecided students in their freshman year of college. A series of online surveys were sent to these students at three time points over one academic year. This longitudinal design was used to provide evidence for the stability in motivation across time as a function of perceived need support from academic advisors. Specifically, this study examined the relation between need-supportive advising and autonomous and competent academic major decision-making. It was hypothesized these forms of decision-making would positively contribute to students' academic satisfaction, efficacy and value toward coursework, and subjective well-being. Additionally, the extent to which these factors play a role in the career intentions of undecided students was explored.

This document will begin by highlighting theory about effective advising and the expected outcomes of advising. Then, self-determination theory will be reviewed, including a review of the practices which have been found across a variety of contexts to support the basic psychological needs of autonomy, competence, and relatedness, as well as subsequent motivational and performance outcomes. Next, how advising can be structured to be more or less need-supportive and the potential benefits of need-supportive advising will be discussed. The methods and procedures that were used in the study will be presented. Then, the analyses will be explained along with the results. Lastly, the findings will be illustrated and limitations and recommendations will be discussed.

## Chapter 2: Literature Review

### ACADEMIC ADVISING

Most broadly, academic advising is intended to "[encourage] students to develop a consciousness of educational decision making" (Schulenberg & Lindhorst, 2010, p. 26). More specifically, the objective of academic advising has been described as "a decision-making process by which students realize their maximum educational potential through communication and information exchanges with an advisor; it is ongoing, multifaceted, and the responsibility of both student and advisor" (Grites, 1979, p. 1).

Currently, the National Academic Advising Association's (NACADA) "Concept of Advising" draws on the notion that "advising is teaching" (Hemwall & Trachte, 1999, 2005; Laff, 1994; Lowenstein, 1999, 2000, 2005; NACADA, 2006). Advocates of this perspective emphasize that advising should be "learning-centered," whereby students learn to uncover or develop the value of their education, generate and appreciate a holistic view of their education, and make choices based on self-initiation and a need for optimal challenge (Lowenstein, 2005). This notion emphasizes that advisors teach students a curriculum about college, including academic policies, degree requirements, available services, among other things, and help students develop critical thinking skills necessary to appropriately navigate the college experience (Hemwall & Trachte, 2005). While NACADA also suggests that the student learning outcomes influenced by advising practices should be determined by each institution in accordance with the mission and vision of the university or college (Schuh, 2008), the Council for the Advancement of Standards (CAS) in Higher Education has provided standards and guidelines for creating learning outcomes through academic advising programs (Dean, 2006). These standards emphasize six categories of outcomes that advising should target and enhance: knowledge acquisition, cognitive complexity, intrapersonal development, interpersonal competence, humanitarianism and civic engagement, and practical competence (p. 4-5). Despite CAS's emphasis on these common goals for all advisors, the specific strategies by which these

student learning outcomes are developed and assessed is expected to vary due to the individuality amongst higher education institutions.

To date, most of the articles published regarding academic advising provide descriptions of advising programs and services, as well as applications of theoretical frameworks among various student populations (i.e., probation students, first-generation college students, non-traditional students, etc). The literature on the effects of advising on relevant student outcomes is sparse. However, the limited existing research examining the effects of advising on students' academic outcomes suggests that advising can have a number of benefits. For example, Metzner (1989) found students' perceptions of advising as high quality was positively related with GPA, satisfaction with coursework, and views of coursework as useful toward future goals. In turn, these outcomes negatively related with students' intentions of leaving the institution and subsequent dropout rates (Metzner, 1989). In another study, minority nursing students who received supplemental academic advising demonstrated increased persistence toward their degree, achievement in nursing courses, and higher board examination scores (Hesser, Pond, Lewis, & Abbott, 1996). Further, other studies have found that students who do not return to an institution report that they would have matriculated had advising services improved (Pantages & Creedon, 1978; Wetzel, 1977). In sum, while clearly there is some research to suggest that academic advising can affect students positively, the limited body of research suggests that the effects of advising on students' outcomes, specifically those related to academic major decision-making, have not been sufficiently examined. Grites (1979) asserted advising is a "decision-making process" (p. 1) which provides support for examining the antecedents and consequences of such a process.

Further, there is some theory and research to suggest that the effects of advising on students' outcomes may vary across advising strategies. One classic distinction is that between prescriptive and developmental advising that emerged in early theoretical work on the various styles of advising (Crookston, 1972; O'Banion, 1972). That is, traditionally, advisors were

viewed as authoritarians who make decisions for students based on their superior knowledge about the courses, degree plans and university policies. This approach reflects a prescriptive advising style. In contrast, developmental advising is marked by practices geared toward helping students develop self-reflective understanding and value their education in order to become critical thinkers and make decisions based on their personal goals (Grites & Gordon, 2000). Theoretically, developmental advising is expected to be more beneficial than prescriptive advising to the extent that developmental advising acknowledges the students' strengths, abilities and skills while encouraging areas of potential growth (Jordan, 2000) and focuses on goal-setting and the goal attainment process (Kadar, 2001). Frost (1991) asserted developmental advising, indeed, did positively influence critical thinking skills. Other research on the debate between prescriptive versus developmental advising has examined students' preferences for advising approach (Fielstein, 1989; Weir, Dickman, & Fuqua, 2005; Winston & Sandor, 1984).

In the mid- to late-1990's researchers in the field began to doubt the value of this dichotomous view of advising. Advising researchers began to borrow from the positive psychology view that focusing on an individual's strengths instead of deficits fosters positive well-being (Seligman & Csikszentmihalyi, 2000) to inform advising theory and practice. From this view, three styles of advising emerged: strengths-based, appreciative, and solution-focused advising (McClellan, 2010).

A strengths-based advising approach entails using goal setting to assist students as they examine and develop their strengths in their academic careers (Schreiner & Anderson, 2005). The advisor would begin by identifying the students' strengths, then encourage students to recognize the value of those strengths in order to assess goals and create an action plan. Limited research has supported the effectiveness of this approach compared to more traditional advising techniques. In a study using strengths-based career counseling, students who received this approach reported more self-efficacy toward career decision-making and satisfaction with student services, compared to students who received traditional career counseling (Schreiner,

2004). Additional research has shown that using strengths-based techniques was positively related with academic achievement, increased retention, and satisfaction with advising (Schreiner, 2000).

Bloom, Huston, and Ye (2008) propose a model of appreciative advising in which the advisor helps the student uncover her strengths through appreciative inquiry; that is, by asking positive open-ended questions which evoke visions of potential opportunities as the student realizes and sets her goals. Additionally, appreciative advisors assist students with plan building and encourage follow through (Bloom et al., 2008). This occurs in a 6-step process whereby advisors disarm the students' anxieties and fears, help students discover their strengths, allow students to communicate their dreams, collaboratively design an action plan to actualize the students' dreams; then, the students deliver on the plan by completing tasks, and the students do not settle as they achieve their goals. Limited research has also suggested that this advising approach may be more effective compared to no advising or traditional advising. In one study, students on academic probation (below a 1.5 GPA), who were enrolled in a program using appreciative advising techniques, showed an increased retention rate of 18% compared to the previous 4-year cohort who were enrolled before the program existed (Kamphoff, Huston, Amundson, & Atwood, 2007). Additionally, these students registered for fewer classes after enrollment in the program, indicating more realistic academic planning (Kamphoff et al., 2007). Compared to students who received academic warnings (GPA between 1.5 and 1.75), probation students in the program received higher GPAs overtime (Kamphoff et al., 2007). One program at Eastern Illinois University using appreciative advising starting in 2009 has found that students have reported greater satisfaction with academic programs and advising quality following the implementation of this form of advising (Bloom et al., 2009).

In solution-focused advising, the advisor and student collaborate to pull from the student's previous successes to address current issues or concerns (Mayhall & Berg, 2003). In the context of working with an undecided student, the advisor first identifies the students' goals (i.e.,

choosing a major). Next, the advisor works with the student to consider an ideal outcome based on the students' competencies from previous experiences. Lastly, the advisor provides homework assignments which are consistent with behaviors needed to facilitate the student's goals. Although no research, to this researcher's knowledge, has tested the effects of solution-focused advising, a meta-analysis of solution-focused therapy in schools may provide some insight. Based on the data from 14 studies, solution-focused therapy, in which school-based practitioners used techniques similar to the solution-focused advisor to help elementary through high school aged students construct ideal outcomes using past successes, helped students decrease their negative affect and control behavioral problems, as well as earn more school credits (Kim & Franklin, 2009). However, compared to students who did not receive this form of therapy, solution-focused therapy did not lead to increases in GPA, school attendance, or on-time graduation rates (Kim & Franklin, 2009).

In sum, theory and research suggest that academic advising has the potential to positively influence students' academic outcomes, particularly critical thinking development (Frost, 1991), retention (Kamphoff et al., 2007; Metzner, 1989; Schreiner, 2000), academic achievement (Kamphoff et al., 2007; Kim & Franklin, 2009; Metzner, 1989; Schreiner, 2000), and satisfaction with services (Bloom et al., 2009; Schreiner, 2000, 2004). Further, there seems to be variability in the effects of advising across various advising strategies. In particular, limited evidence on developmental advising strategies and advising strategies originating from the positive psychology movement suggest that these approaches may be more strongly related to student outcomes compared to prescriptive or traditional advising strategies (Kamphoff et al., 2007; Schreiner, 2000, 2004). Thus, all in all, there is a need for research to explore the relations between academic advising and students' academic outcomes, with a particular focus on identifying specific advising approaches most strongly related to students' outcomes and the mechanisms through which advising influences the most distal (and most frequently studied) student outcomes (e.g., academic achievement, college retention, and career intentions). This

study will address this omission in the literature by focusing on both proximal (i.e., decision-making attitudes and skills, satisfaction with advising and academics, and academic motivation) and distal student outcomes (i.e., career intentions) by using self-determination theory, discussed next, as a guiding framework for making predictions about when advising will be most supportive of students' outcomes.

#### **SELF-DETERMINATION THEORY**

Self-determination theory posits that human functioning is optimized when an individual's basic psychological needs for autonomy, competence and relatedness are met (Deci & Ryan, 1985; Ryan & Deci, 2000). When these three needs are supported by the environment, internalized motivation toward activities in that context and general well-being are enhanced (Ryan & Deci, 2000; Niemiec & Ryan, 2009). The need for autonomy is satisfied by the experience that one is engaging in activities which are self-initiated (Deci & Ryan, 1985, 1987; Ryan & Deci, 2000). Satisfaction of the need for competence reflects the experience that one has mastered tasks through successful interactions with one's environment (Deci & Ryan, 1985, 1987; Ryan & Deci, 2000). The third need, relatedness, is satisfied when one experiences a sense of belongingness and feels supported or cared for by others around them (Ryan & Deci, 2000). The present study will focus on support of all three psychological needs and collectively refer to them as need-support.

Fulfillment of these needs in the context of a task promotes active engagement in that task. Further, self-determination theory suggests that satisfaction of the needs for autonomy, competence, and relatedness may work in concert to support adaptive functioning. That is, in order for competence and relatedness to enhance intrinsic motivation, one must also have a sense of autonomy (Ryan & Deci, 2000). Motivation research has long emphasized students' enhanced need satisfaction as having consequences for students' motivation and values for school-related tasks, self-efficacy, and academic performance. Specifically, students reporting greater perceived academic competence, or greater subjective evaluations of how skilled they believe themselves



to be, and greater autonomous regulation; that is, a tendency to engage in action which is fully self-endorsed and performed out of volition, have been found to demonstrate greater persistence in academic related tasks, deeper processing of material, better study habits, and higher academic achievement (e.g., deCharms, 1976; Ferla, Valcke, & Schuyten, 2010; Fortier, Vallerand, & Guay, 1995; Grolnick & Ryan, 1987; Guay, Boggiano, & Vallerand, 2001; Vansteenkiste et al., 2005). For example, students who feel more autonomous toward academics have reported higher grades (Fortier et al., 1995). Additionally, Jang and her colleagues (2009) found autonomy and competence positively predict achievement. Studies including involvement or warmth, which are conceptualized as relatedness constructs, have produced significant findings. In one study, teachers' perceived students as more competent toward schoolwork when the children's parents were labeled as autonomy supportive, and mothers indicated greater involvement with their children (Grolnick & Ryan, 1989). Maternal involvement also was positively related with achievement and negatively related with maladaptive class conduct (Grolnick & Ryan, 1989). In another study, parental involvement and autonomy support related with felt autonomy and competence which, in turn, positively predicted academic achievement (Grolnick, Ryan, & Deci, 1991).

While perceived competence has been studied as a predictor of outcomes such as those mentioned above, perceptions of competence may be an outcome, as well. Feelings of intrinsic motivation have contributed to students' feelings of competence (or efficacy) toward academic-related tasks (Deci, Schwartz, Sheinman, & Ryan, 1981). Similarly, Williams and colleagues (1998a, 1998b, 2009a, 2009b) have proposed a model whereby autonomous motivation contributes to adaptive outcomes through perceived competence. Additional evidence supports the relation between autonomy support and perceived competence through autonomous regulation (Williams & Deci, 1996). In their study, medical students who rated their instructors as autonomy supportive experienced more autonomy overtime which, in turn, contributed to more felt competence in the students' interviewing skills (Williams & Deci, 1996). The current

model proposes to compare this model, indicating a change in perceived competence overtime as a function of the influence of need satisfaction in one's advising relationship on autonomous regulation, with a model demonstrating perceived competence and autonomous regulation occur simultaneously as a function of need satisfaction.

Research also suggests that needs satisfaction, motivation, and efficacy related outcomes may have consequences for subjective well-being (e.g., Custers, Westerhof, Kuin, & Riksen-Walraven, 2010; Sheldon & Bettencourt, 2002; Sheldon & Elliot, 1999; Sheldon & Niemiec 2006; Smith, Ntoumanis, Duda, & Vansteenkiste, 2011), conceptualized as a composite of experiences of satisfaction with life, positive affect and lack of negative affect (Deiner, 1987), as well as long-term goals and career aspirations (Bandura, Barbaranelli, Cabrara, Pastorelli, 2001; Baruch, 1976; Vallerand, Fortier, & Guay, 1997; Sheldon & Elliot, 1998; Sheldon & Kasser, 1998). For example, in a series of four studies, Sheldon and Niemiec (2006) found that balanced need satisfaction in which the satisfaction of each individual need is weighted equally positively predicted enhanced subjective well-being. In a study using multiple time points, need satisfaction positively influenced subjective well-being across time (Sheldon & Elliot, 1999). Likewise, Bandura and his colleagues (2001) found children's academic efficacy positively predicted academic aspirations. Autonomously regulated goals have positively influenced goal attainment, as well (Sheldon & Elliot, 1998; Sheldon & Kasser, 1998). Multiple studies have shown autonomous regulation and perceived competence had positive effects on behaviors related to long-term health benefits, such as smoking cessation (e.g., Williams et al., 2011; Williams, Gagné, Ryan, & Deci, 2002; Williams; Niemiec, Patrick, Ryan, & Deci, 2009), glucose monitoring and regular diabetes medication usage (Williams et al., 2009; Williams, Freedman, & Deci, 1998), and weight loss activities (Williams, Grow, Freedman, Ryan, & Deci, 1996).

Following the long history of the positive outcomes of autonomous regulation and perceived competence within warm and caring relationships, it seems likely that autonomous and competent academic decision-making may lead to similar outcomes. That is, to the extent that a

student feels successfully choosing a major is self-initiated and is achievable, the student may value academically related tasks, feel a sense of confidence toward coursework, attain higher grades, and impact career intentions. However, in order to satisfy ones' psychological needs of autonomy, competence, and relatedness, one must be supported by the environment (Niemic & Ryan, 2009; Ryan & Deci, 2000). Research on autonomy-, competence- and relational-supportive practices have outlined specific behaviors, as well as examined beneficial outcomes of these behaviors. How the process in which need-satisfaction leads to enhanced motivation and academic outcomes is initiated by environmental supports is discussed next.

### **Autonomy-Supportive Practices**

A great deal of research has highlighted the benefits of autonomy-supportive practices in classroom, clinical, workplace, and practical settings (e.g. Reeve & Jang, 2006; Reeve & Hardré, 2009; Williams, Freedman, & Deci, 1998; Williams et al., 2006b). In the classroom context, students with autonomy-supportive teachers have displayed enhanced engagement, intrinsic motivation (Deci, Nezlek, & Sheinman, 1981; Guay, Ratelle, & Chanal, 2008), well-being (Deci et al., 2001; Patrick, Skinner, & Connell, 1993), performance (Boggiano et al, 1993; deCharms, 1976; Flink et al., 1992), and conceptual learning (Grolnick & Ryan, 1987; Vansteenkiste et al., 2005). Additionally, similar benefits have been found in workplace (Hardré & Reeve, 2009), parenting (Chirvok & Ryan, 2001), and therapeutic settings (Williams et al., 2006a, 2006b).

Research has uncovered a number of specific strategies to support individuals' sense of autonomy and enhance motivation in the classroom (see Su & Reeve, 2011, for review). Specifically, offering meaningful rationales and choices, allowing expression of negative feelings, and using non-controlling language are crucial practices for autonomy support (e.g., Assor, Kaplan, & Roth, 2002; Cordova & Lepper, 1996; Gottfried, Fleming, Gottfried, 1994; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005; Reeve & Jang, 2006). For example, Assor, Kaplan, and Roth (2002) found that teachers relating the nature of the task to the students' goals, providing choices, and permitting students to express dissatisfaction with the task were

essential behaviors for enhancing engagement. Additionally, of these behaviors, relating the nature of the tasks to goals had an especially positive relation with positive feelings toward coursework, such as interest and enjoyment, and engagement (Assor, Kaplan, & Roth, 2002). In a multi-condition experiment, Cordova and Lepper (1996) found that task involvement, perceived competence and need for challenge were higher in participants for whom the fantasy game was a meaningful context, personalized, and personally chosen. In another study, Reeve and Jang (2006) found that providing informative and encouraging feedback, providing students time to work on tasks independently, and the time students spent talking positively predicted perceived autonomy while, using controlling language and questions negatively predicted perceived autonomy. Perceived autonomy, in turn, led to engagement, interest, and performance toward an academic task (Reeve & Jang, 2006).

Of particular interest to the current study, a recent study demonstrated that teachers' autonomy-support positively predicted need satisfaction, engagement, and achievement, longitudinally over the course of a semester (Jang, Kim, & Reeve, 2012). Specifically, this research showed that teacher autonomy support at time 1 positively predicted need satisfaction at time 2, which, in turn fully mediated the relation to engagement at time 3. Engagement at time 3 also fully mediated the relation between autonomy support at time 1 and need satisfaction at time 2 on end-of-semester achievement. The current study used a similar model to test for mediation between the relation of students' perceptions of need-supportive advising on autonomous and competent academic major decision-making through need satisfaction.

The benefits of autonomy-support are not limited to the classroom. Extensive research in parenting and workplace settings has suggested that autonomy support has benefits in these contexts as well. Similar to teacher autonomy-supportive practices, parents can provide rationale and choice, use non-controlling language, and acknowledge the feelings of the child to enhance the autonomy and intrinsic motivation of their children (Joussemet, Koestner, Leves, & Houliort, 2004). Parental autonomy support has positively influenced academic adjustment in college

students (Luyckx, Soenens, Goosens, & Vansteenkiste, 2007), task-related persistence in infants (Frodi, Bridges, & Grolnick, 1985; Grolnick, Frodi, & Bridges, 1984), and positive well-being (Chirkov & Ryan, 2001). Likewise, Hardré & Reeve (2009) investigated managers' use of autonomy support and its effects on employee engagement. In line with the autonomy-supportive practices discussed previously, this research indicated that the following behaviors were autonomy supportive in the workplace: recognizing and fostering employees' interests, using non-controlling language, providing rationale, and permitting negative feedback. Although employees with autonomy-supportive managers did not report more intrinsic motivation toward work, in general, these employees did experience enhanced work-related engagement (Hardré & Reeve, 2009).

Additionally, counseling practices in therapeutic settings that consider and support patients' psychological needs have been found to enhance patients' intrinsic motivation to change or adopt healthier behaviors (Ryan et al., 2011; Williams, Deci, & Ryan, 1998). Autonomy-supportive counseling involves providing rationale for treatment, as well as choice, and continuous acknowledgement of the client's interests (Deci, Eghrari, Patrick, & Leone, 1995; Ryan, 1995; Zeldman, Deci, Fiscella, 2004). In a study conducted on clients receiving counseling for methadone maintenance, perceived autonomy support from counselors positively influenced decreased relapse, fewer missed appointments, and earlier allowance of take-home dosages of methadone. Similarly, depressed clients who perceived their therapists as autonomy supportive experienced enhanced autonomous regulation which, in turn, predicted fewer depression symptoms and higher likelihood of reaching remission (Zuroff et al., 2007). Indeed, autonomy-supportive practices enhance motivation; similar benefits have been found in competence-supportive environments.

### **Competence-Supportive Practices**

Needs-support research has focused heavily on autonomy-supportive environments or practices. However, competence-supportive practices may also be crucial to supporting adaptive

outcomes, including engagement (Skinner & Belmont, 1993; Jang, Reeve, Deci, 2010), perceptions of competence (Levesque, Zuehlke, Stanek, & Ryan, 2004), and fewer maladaptive academic behaviors (Patrick, Turner, Meyer, & Midgley, 2003). Provisions of affirming feedback, a common practice in competence-supportive environments, have contributed to beneficial outcomes in therapeutic relationships (see, Claiborn, Goodyear, & Horner, 2002, for a review).

As with autonomy-support, a number of practices have been linked with enhanced perceived competence and, in turn, other adaptive outcomes. Skinner and Belmont (1993) assert that a classroom environment marked by structure in which expectations are clearly communicated and activities are tailored to students' abilities will enhance students' perceptions of competence. They found that students' perceptions of their teachers as facilitating structure in these ways predicted effortful behavior and persistence during academic tasks. Similarly, Jang and colleagues (2011) found that teachers' use of clear instructions, strong guidance, and informative feedback positively contributed to student engagement independently of autonomy support. Farkas and Grolnick (2010) conceptualized parental structure as providing clearly and consistently articulated guidelines and consequences, informative feedback, rationales for expectations, as well as demonstrating authority. Parental structure positively predicted perceived control, felt competence, and grades among middle school students (Farkas & Grolnick, 2010).

Providing regular non-comparative and informative feedback has also been found to enhance perceived competence, as well as persistence, interest, and engagement (Anderson, Manoogian, & Reznick, 1976; Butler, 1987; Deci, 1971, 1972; Harackiewicz, 1979). For example, Levesque and her colleagues (2004) found that positive and informative feedback fostered perceived competence in both German and American college students. Zook and Herman (2011) found that students' perceptions of teacher competence-support in the form of clearly explained and organized materials and feedback focused on students' effort, creativity,

and strategy had the strongest effect (compared with autonomy- and relatedness-support) on intrinsic motivation in a specific course. Positive feedback has predicted perceived competence and intrinsic motivation in PE contexts as well (Allen & Howe, 1998; Amorose & Horn, 2000; Chelladurai & Saleh, 1980; Koka & Hein, 2003). Allen and Howe (1998) found that frequent encouraging, informative, corrective and positive feedback predicted female athletes perceived competence and satisfaction with their coach and team involvement.

Additionally, positive feedback in therapeutic relationships has produced constructive outcomes. Claiborn and his associates (2002, 2005) assert that while feedback is not a typical outcome assessed in therapy settings, there is support for its use. Specifically, the authors express feedback is most optimal when it is clear, unbiased, considerate of the client's goals, and at a time when the client is able to receive the feedback (Claiborn & Goodyear, 2005). In a case study with a client who experienced agoraphobia (anxiety expressed as the inability to escape situations or environments perceived as threatening), the therapist offered evaluative feedback and expressed confidence in the client's abilities which supported the clients behavior change (DeVoge, Minor, & Karoly, 1981). Clearly, providing feedback has benefits in multiple settings; however, the relationship between the giver and the receiver may be equally important, to the extent that the receiver feels connected to the giver.

### **Relatedness-Supportive Practices**

Practices which support relatedness, or the need for belonging, have not been investigated in as much detail as autonomous- and competence-supportive practices. However, the literature provides some evidence for the impact of relatedness support on adaptive outcomes. Specifically, perceptions of relatedness with teachers, parents, and peers has been linked with engagement (Furrer & Skinner, 2003; Skinner & Belmont, 1993), interest and enjoyment (Zook & Herman, 2011), well-being (Kasser & Ryan, 1999), perceived competence (Anderman & Anderman, 1999), and achievement (Ratelle, Larose, Guay, Senécal, 2005). Additionally, supporting one's

need for belonging in therapeutic relationships has a long history indicating its benefits (e.g., Rogers, 1957; Farber & Doolin, 2011).

The research on relatedness support suggests that a person's experience of relatedness is supported when others display interest, demonstrate involvement, show warmth, and make one feel special and have intimate relationships with others in one's environment (Furrer & Skinner, 2003; LaGuardia & Patrick, 2008; Baumeister & Leary, 1995; Kasser & Ryan, 1999). Skinner and Belmont (1993) conceptualize teacher involvement as demonstrating affection toward the student, expressed interest in the student, as well as being available and dedicated. Actual teacher involvement, as reported by teachers, had a direct effect on student engagement, above the indirect effect through students' perceptions of teacher involvement. Another study showed that students with a sense of belongingness toward their school, as defined by feeling respected and comforted by peers, teachers, and other school personnel, displayed enhanced orientation toward tasks to gain understanding and perceived competence (Anderman & Anderman, 1999). Perceived parental involvement was positively related with achievement in high school science courses, although there was a spurious effect of involvement on future persistence in a science program at college (Ratelle, Larose, Guay, & Senécal, 2005). Warmth and involvement also provide the foundation for behavioral change in therapeutic relationships.

Carl Rogers (1957) asserted therapists should show unconditional positive regard in helping relationships. The client should feel accepted as is through expressions of warmth and non-judgment (Cormier & Thackney, 1999; Rogers, 1957; Sharf, 1999). A meta-analysis of positive regard in therapeutic relationships showed a significant, yet moderate relation with treatment outcomes (Farber & Doolin, 2011). Considered a basis for most psychotherapy interventions, unconditional positive regard provides foundation for client growth through the use of additional therapeutic strategies (Farber & Doolin, 2011). Conversely, research on perceived parental conditional positive regard, or perceived parental warmth, which relies on the child's achievement of parentally endorsed behaviors or outcomes, shown to promote academic



achievement thwarts interest development (Roth, Assor, Niemiec, Ryan, Deci, 2009). Additionally, parental conditional positive regard positively influenced an inflated sense of self following success, and shame following failure, which, in turn, positively influenced maladaptive intense investment in academic tasks (Assor & Tal, 2012). Based on these findings, enhanced feelings of relatedness may benefit from positive regard to the extent that it demonstrates warmth and acceptance without pressure.

### **Summary**

Extensive research on autonomy support has shown practices such as providing meaningful rationales and choices, permitting expression of negative feelings, and using non-controlling language are essential to enhance intrinsic motivation, engagement, academic achievement, as well as additional adaptive outcomes (e.g., Assor, Kaplan, & Roth, 2002; Cordova & Lepper, 1996; Gottfried, Fleming, Gottfried, 1994; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005; Reeve & Jang, 2006). Additionally, providing structure, or supporting ones' need for competence, by clearly communicating instructions, offering tasks which are tailored to students' abilities (Skinner & Belmont, 1993), providing clear consequences for children's actions and informative feedback while demonstrating authority (Farkas & Grolnick, 2010) enhance students' perceptions of competence. Feedback is most beneficial to the extent it is encouraging and clearly addresses specific concerns to correct (Allen & Howe, 1998; Levesque et al., 2004). Feelings of belonging or relatedness are best experienced through demonstrations of warmth, involvement, and unconditional positive regard which have been shown to positively impact achievement, engagement, and personal growth (Baumeister & Leary, 1995; Furrer & Skinner, 2003; Kasser & Ryan, 1999; LaGuardia & Patrick, 2008; Rogers, 1957; Skinner & Belmont, 1993). Due to these beneficial outcomes in various settings, the current study purposes similar benefits in advising relationships consisting of autonomy, competence, and relatedness support.

## **Need-Supportive Advising**

Given research illustrating the benefits of need-supportive practices in classroom, workplace, clinical, home, and sports settings (e.g., Allen & Howe, 1998; Chirkov & Ryan, 2001; Deci et al., 1981; Hardré & Reeve, 2009; Williams et al., 2006a, 2006b), it seems important for advisors to think about how to foster students' perceived autonomy, competence, and relatedness in order to facilitate longer-term goals of enhancing interest, engagement, effort, and satisfaction with their academic degree plan, as well as ultimately enhance academic performance and career outcomes. Based on previous research (e.g., Furrer & Skinner, 2003; Skinner & Belmont, 1993; Su & Reeve, 2011), a number of strategies could be used to create need-supportive advising environments. In particular, advisors striving to support students' autonomy might devote time to asking students questions about their goals and listen attentively to students' responses. A need-supportive advisor can help a student develop interests during the exploration process by asking questions and providing choices relative to the student's interests based on the advisor's wealth of knowledge regarding degrees and other resources. For example, if a student expresses interest in healthcare, the advisor may suggest majoring in Healthcare Administration, Nursing, and Biology, to name a few options. Advisors should be knowledgeable about degree programs and requirements, and additional resources (Nutt, 2000). These skills help students feel supported as they explore majors, create degree and life plans, and reflect on themselves as a learner (Fox, 2008).

Additionally, advisors could also refrain from using directive statements or commands and allow students to initiate behaviors associated with choosing a major. It is important for advisors to avoid using controlling language, such as “should”, “must”, and “ought” to when relaying these messages. For example, an advisor could say, “It is likely to be beneficial to your academic career if you select a major before your sophomore year of college” instead of “You must choose a major by the end of this year.” When helping a student choose their academic majors, advisors can make connections between students' interests and available programs, allow students to express opinions and negative feelings about the degree programs and process of

academic decision-making, and encourage students to engage in coursework related to their interests and goals. Oftentimes there are requirements and policies which inhibit students' wants. For example, most academic programs have coursework requirements that, from the students' perspective, can sometimes seem extraneous and undesirable, such as calculus for business majors, language courses for art history majors, statistics for psychology majors, and the like. In these situations, it is important the advisor allows the student to express dissatisfaction with these conditions in an appropriate manner, as well as provide alternative courses or majors which relate to the student's interests.

In line with prior work on competence-support across a variety of contexts, advisors might attempt to support students' perceptions of competence by providing structure during advising appointments in the following ways: 1) clearly communicating their expectations for the session, 2) being mindful of the individual students' needs and abilities, and 3) offering consistent, informative and encouraging feedback. More specifically, many advisors have begun providing their students with an advising syllabus which includes expectations and intended outcomes of the advising experience (Appleby, 2008; Trabant, 2006). In the syllabus, advisors may explain the flow of the sessions and ask students to compile a list of questions they wish to address during the session (McKamey, 2007). Additionally, including advising learning outcomes and the methods by which they are measured can help the students know what they are expected to learn and through what means (Appleby, 2008). Advisors can utilize students' previous successes as a prompt to steer students toward engaging in activities which could create additional mastery experiences. For example, an undecided student who has been having trouble choosing a major shares his experiences of enjoying being on the high school debate team and winning several awards with his advisor. Utilizing these experiences, the advisor can provide resources which could offer the student opportunity to succeed in similar situations and potentially assist in the major decision-making process. Advisors can guide students through the academic major selection process by supplying their students with informative feedback as they

attempt to master their goals. In particular, advisors can praise undecided students' efforts, such as attending career fairs or taking an online career assessment, and encourage other decision-making activities to reinforce appropriate choosing behaviors.

Fox (2008) recommends advisors show authentic interest in students and communicate using empathy and compassion during one-on-one sessions. Previous research on relatedness support suggests these techniques along with others to foster a sense of relatedness, will be motivating. Other practices advisors can use include being available and expressing dedication to students. For example, advisors can provide students with their contact information, such as office phone numbers and email addresses, so that students will be able to reach advisors when necessary. However, advisors should be mindful of setting healthy boundaries regarding when and how students may contact them. Additionally, advisors can help students feel special by reaching out to students personally. Sending students' emails addressed to them individually or using their first names, instead of through mass emails, can foster a sense of closeness. It is also important that advisors listen to students' stories without judgment or advisors' own biases.

In fact, most of the practices defined as need-supportive academic advising from a self-determination theory perspective may already be highly recommended by advising scholars, though such practices are not typically labeled "need-supportive." Gordon (2007) suggested six tasks advisors should engage in to facilitate the major decision-making process among undecided students. First, advisors help students identify the causes of the students' indecision. During subsequent advising sessions, advisors assist students with formulating an exploration plan, as well as an action plan once a major has been chosen. Throughout the process, advisors help students navigate and organize the available information, while offering support and encouraging student follow-up. Additionally, Gordon (2007) notes the use of advising centers for undecided students which are specifically designed to offer specialized services to these students early in their academic careers. She states that these centers' advisors should be sensitive to these students' needs and know "the individual student's unique interests, abilities, needs, and values"

(p. 127). These criteria match closely with those found to enhance intrinsic motivation, autonomy, competence, and relatedness.

### **Predicted Benefits of Need-Supportive Advising**

In line with the literature on need support in classroom, workplace, clinical, and other applied settings, we would expect that the benefits of advising would be enhanced when practices that are responsive to individuals' psychological needs are integrated into the advising context. Thus, we would expect that students' autonomous motivation, engagement, and performance on the focal tasks in advising sessions would be enhanced as a function of more need-supportive advising.

The most immediate benefits of need-supportive advising may be for motivation and attitudes surrounding major decision-making, a central task of the advising process. That is, need-supportive advising is likely to have a positive impact on autonomous regulation, as well as enhanced feelings of competence toward the decision-making process. To the extent that need-supportive practices have influenced autonomous motivation and perceptions of competence, through need satisfaction, in several settings (e.g., classroom, parenting, coaching, counseling), the same may be true for advising situations. Indeed, there is some research to suggest that autonomy support influences students' career decision-making. Guay et al. (2003) found diminished feelings of autonomy and self-efficacy toward career decision-making activities among those students with parents and friends who used controlling feedback. The authors recommended that counselors (or advisors) engage in autonomy-supportive practices to induce feelings of self-efficacy and autonomy toward decision-making tasks.

The potential benefits of need-supportive advising for enhancing students' outcomes related to major decision-making may be particularly important to consider in light of research indicating that students who enter college undecided of a major tend to experience poorer school and career outcomes compared to decided students, including perceived need support and need satisfaction. Guay and his colleagues (2006) found that decided students reported higher levels of

self-efficacy than undecided students. Additionally, decided students reported more perceived autonomy toward career decision-making, experienced more autonomy support from friends and fewer controlling messages and behaviors from friends and parents than chronically undecided students (i.e. those for whom experiences of indecision are stable and moderate over time). These findings suggest that exploring the potential link between students' perceptions of need-supportive advising and feelings of autonomy and competence in the context of academic decision-making may be particularly informative among undecided students.

Going further, need-supportive compared to traditional advising may be useful to the extent that it may more effectively address a host of personal and social factors contributing to a students' undecidedness (Gordon, 2007). That is, undecided students tend to experience more anxiety toward decision-making (e.g., Goodstein, 1965; Fuqua, Seaworth, & Newman, 1987) and exhibit low efficacy toward decision-making (Taylor & Betz, 1983), when compared to decided students. Advising that supports the autonomy, competence, and relatedness may help to address these challenges for undecided students in particular. Some evidence suggests this might be the case. For example, in one study, students experienced less indecision when they had mothers who encouraged independence (Guerra & Braungart-Rieker (1999). Berrios-Allison (2005) found that closely connected families promoted exploration and decision-making commitment. All in all, to the extent that advising supports one's needs for autonomy, competence, and relatedness, undecided students may experience a sense of being self-initiating and competent in their decision-making, which should benefit the academic major choosing process and other academic outcomes.

Beyond decision-making attitudes and experiences, need-supportive advising is likely to impact other outcomes related to students' academic coursework. Specifically, need-supportive advising is expected to predict enhanced satisfaction, efficacy, and value toward academic coursework, as well as greater subjective well-being, and future career intentions. These relations are expected to be indirect through the satisfaction of autonomy, competence, and relatedness

needs and autonomous regulation and perceived competence toward academic major decision-making, both of which are expected to have a direct influence on the outcomes. Additionally, these relations are expected to remain stable stronger over time as the advising relationship develops.

Prior research has suggested that students' perceived autonomy and competence in their relationship with their academic advisors positively predicted value toward coursework among college students (Leach & Patall, 2013). Other research has found a positive link between self-efficacy and academic satisfaction or one's satisfaction with the academic environment (e.g., Dewitz & Walsh, 2002; Lent, Singley, Sheu, Schmidt, Brenner, Treistman, Ades, 2005; Okun & Weir, 1990). Academic satisfaction reflects several aspects of the college experience including: social life, quality of education, university atmosphere, and student services (Dewitz & Walsh, 2002; Lent et al., 2005; Okun & Weir, 1990). Additionally, Leach and Patall (2013) found that advising that was need satisfying led to academic satisfaction. Academic satisfaction has also had a positive direct effect on life satisfaction (Lent et al., 2005; Ojeda et al., 2011), an indicator of subjective well-being (Diener, Emmons, Larsen, & Griffin, 1985). Similarly, need satisfaction has positively predicted subject well-being (e.g., Sheldon & Elliot, 1999; Sheldon & Niemiec, 2006). Need-supportive and need-satisfying environment have predicted academic achievement (e.g., Grolnick, Ryan, & Deci, 2001; Jang, Kim, & Reeve; 2012; Ratelle, Larose, Guay, & Senécal, 2005). Enhanced intrinsic motivation is expected to positively influence career intention, similar to the benefits of intrinsic motivation on goal attainment and academic aspiration (e.g., Bandura et al., 2001; Sheldon & Kasser, 1998). The present study will test the directional effects between the outcomes, as well as the relations over time.

## **PRESENT STUDY**

A wealth of research has suggested that need-supportive practices have benefits for human functioning across a variety of contexts. Thus, it stands to reason that advising may be more beneficial when students' needs are considered. This may be particularly useful for solving

long-standing problems related to undecided status because need-supportive advising may more effectively support a number of desirable outcomes including autonomous and competent decision-making, perceived value, competence, and satisfaction toward coursework, psychological well-being, and career intentions. However, research has yet to test this adequately. Thus, the purpose of this study was to investigate need-supportive advising as not only essential in academic major decision-making, but in academic satisfaction and additional motivation-based outcomes with known consequences for achievement and learning. In line with hypotheses regarding autonomous and competent decision-making, it seemed likely that need-supportive advising, through need satisfaction, will best support a menagerie of adaptive motivation outcomes, including academic satisfaction, as well as academic efficacy, value toward coursework, and subjective well-being.

### **Research Questions**

Do students' perceptions of their advisors as need-supportive influence students' own sense of autonomy and competence toward choosing a major? Does a sense of autonomy and competence regarding academic decision-making affect students' academic satisfaction, and academic efficacy and value toward their coursework, as well as well-being? Do these relations remain stable over time? Do these factors, in turn, influence students' intentions of pursuing a career in their chosen major?

### **Hypotheses**

#### ***Hypothesis 1***

Advising experiences which support students' needs for autonomy, competence, and relatedness will positively predict students' basic psychological needs satisfaction.

#### ***Hypothesis 1a***

This relation will remain stable over the course of the academic year.



### ***Rationale 1***

Previous research in related domains (i.e. teaching, therapy) has supported the above showing that autonomy support from teachers, for example, has influenced students' perceived autonomy overtime (Jang et al., 2012). The current study seeks to expand on these findings demonstrating the long term effects of autonomy support, by examining the impact of competence and relatedness support on need satisfaction. Specifically, research has shown structure and informative feedback to predict felt competence (e.g., Levesque et al., 2004; Skinner & Belmont, 1993). Research on relatedness support has found involvement to satisfy students need for belonging (Skinner & Belmont, 1993).

### ***Hypothesis 2***

Basic need satisfaction will positively predict autonomously regulated and competent academic major decision-making.

### ***Hypothesis 2a***

This relation will remain stable over the course of the academic year.

### ***Rationale 2***

For students who are currently undecided about their college major, an advising relationship which satisfies ones' needs of autonomy, competence, and relatedness has shown to have adaptive outcomes (Leach & Patall, 2013). It is important for these students to be able to make academic decisions, confidently and which are self-initiated. While some support exists indicating the positive influence of autonomy support for autonomously regulated decision-making (Guay et al., 2003, 2006), there are gaps in the literature regarding the impact of basic need satisfaction on decision-making. Additionally, research has shown the importance of competent decision-making among undecided students (Taylor & Betz, 1983).

### ***Hypothesis 3***

Autonomously regulated and competent major decision-making will positively predict enhanced academic satisfaction, academic efficacy, value toward coursework, and subjective well-being, as well as future intention to pursue a career related to academic major.

### ***Hypothesis 3a***

This relation will remain stable over the course of the academic year.

### ***Rationale 3***

Research has shown the positive relation between need-satisfaction in the advisor-student relationships and academic task value (Leach & Patall, 2013). Additionally, research has shown positive relations between need-satisfaction and academic satisfaction and academic efficacy (Deci et al., 1981; Leach & Patall, 2013). The positive link between need satisfaction and subjective well-being has been substantiated, as well (Sheldon & Elliot, 1999; Sheldon & Niemiec, 2006). The current study seeks to expand on these finding by highlighting the direct effect of autonomous regulation and perceived competence toward decision-making on these outcomes. Previous research has shown positive effects of felt autonomy and competence on goal attainment and future intentions (Bandura et al., 2001; Sheldon & Elliott, 1998; Sheldon & Kasser, 1998). The present study seeks to expand on this body of research by examining these relations within the context of academic advising relationships.

## Chapter 3: Method

### PARTICIPANTS

Students were recruited to participate in the study from the School of Undergraduate Studies (UGS), Educational Psychology subject pool, and correspondence from professors in various departments from a large research institution located in the Southwestern region of the United States. The target participants were first-year students, as these students are likely to select a major at the end of their second semester (D. Spight, personal communication, July 23, 2012). The subject pool is a population consisting of the students enrolled in a set of undergraduate courses taught in the College of Education and dealing with psychological topics. Students in these courses are required to complete a set number of hours of participation in research or complete an alternative assignment if they wish not to participate in research. A copy of the consent form is available in Appendix A and a copy of the recruitment email sent to UGS students is available in Appendix B.

During the 2012-2013 academic year 104 participants completed the survey at time point 1. All of those participants were recruited to complete the second time point. Twenty-seven participants completed the survey at time point 2. All of those participants were recruited to participate during the third time points. Only 15 students completed the third survey. There was no strong incentive for participating and participation was voluntary which possibly led to the level of attrition. As the data was analyzed, 13 students at time 2 and 8 students at time 3 were discovered to be undecided/undeclared.

Therefore, additional participants were recruited during the 2013-2014 academic year. Along with the previous recruitment methods, additional strategies were used to gather a larger sample. Professors who teach general education core curriculum courses predominately completed by first-year students were invited to share the study with their students. Additionally, to provide additional incentive, professors were asked to offer one point of extra credit to their students who complete the study. A copy of the email that recruited students received is available

in Appendix C. Five hundred and ninety-nine participants completed the survey at the first time point. Due to the multiple avenues used to recruit participants for this study, not all participants in time point 1 were first-year students and/or undecided or undeclared students. All undecided/undeclared students were not also first-year students; however, all of these students were retained. Two hundred and fifty-seven participants from time point 1 were undecided/undeclared students. Those students were recruited for time point 2. One hundred and twenty-four participants completed time point 2. Due to the level of attrition between the first two time points, the 257 participants from time point 1 were recruited to complete the third time point. Therefore, there were participants who completed the third time point who had not completed time point 2. One hundred and two participants completed time point 3. However, eighty-seven students completed all 3 time points during the 2013-2014 academic year. Although participants received a monetary incentive at each time point, the removal of the course extra credit incentive may have led to attrition between the time points. Table 1 provides an illustration of the participation, recruitment, and target population numbers.

The data sets from both academic years were combined for a total of 102 (15 from the 2012-2013 academic year and 87 from the 2013-2014 academic year) participants who completed all three time points. Of that total, only 94 (8 from the 2012-2013 academic year and 86 from the 2013-2014 academic year) were undeclared students. Sixty students (63.83%) were first-year students, 26 (27.66%) were sophomores, 7 (7.45%) were juniors, and 1 (1.06%) student was labeled as a transfer student. Students' ages ranged from 18 to 23 with an average age of 18.59. Sixty-seven students (71.28%) were female, 26 (27.66%) were male, and 1 student did not provide their gender. A majority of students were Asian-American (44, 46.81%), followed by Caucasian (26, 27.66%), Latino (17, 18.09%), African-American (5, 5.31%), and Middle-Eastern (2, 2.13%) students.

A second data set from both academic years was created in order to test stability between two time points. From the 2012-2013 academic year there were 13 participants who completed

the survey at time points 1 and 2. From the 2013-2014 academic year there were 34 participants who completed time points 1 and 2 and 101 who completed time points 1 and 3. The first time point was time point 1, while the second time point was either time point 2 or 3 from the groups as described above. There were more undeclared students who completed time points 1 and 2 during the 2012-2013 academic year than those who completed time points 1 and 3 ( $n = 8$ ). Also, the large amount of participants who completed time points 1 and 3 during the 2013-2014 year was due to students being recruited at time point 3 who had not completed time point 2. Additionally, some of those who had completed time point 2 did not complete time point 3. Eighty-seven students (58.78%) were first-year students, 40 (27.03%) were sophomores, 15 (10.14%) were juniors, and 4 (2.7%) were seniors and 2 (1.35%) students were labeled as transfer students. Students' ages ranged from 18 to 35 with an average age of 18.93. One hundred-six students (71.62%) were female, 40 (27.03%) were male, and 2 students did not provide their gender. A majority of students were Caucasian (56, 37.84%), followed by Asian-American (50, 33.78%), Latino (30, 20.27%), African-American (5, 3.38%), Middle-Eastern (3, 2.03%), other (3, 2.03%), and Native-American (1, .67%) students.

## **MEASURES**

### **Student Characteristics**

Participants were asked demographic questions regarding ethnicity, age, year in school, gender, and GPA. In addition, the following questions were included: number of advising sessions had, academic advisors initials, number of majors declared in the past, what major, if any, had been chosen, and time to degree completion. During the third phase of the study, participants were asked to assess the likelihood of pursuing a career related to their chosen major. These questions appeared at the end of the online survey to reduce any potential for bias or stereotype threat based on student responses. To account for any bias, students were asked to rate the extent to which they experienced any bias from their advisors regarding the students'

gender and ethnicity. Also, participants were able to add any additional information about their advising experiences in an open-ended response.

### **Autonomy-Supportive Advising**

An adapted version of the Learning Climate Questionnaire (Williams & Deci, 1996) measured participants' perceptions of autonomy-supportive academic advising (15 items). An example item is, "My advisor makes sure I really understand the goals of my degree and what I need to do." One item in the scale was reverse-coded. Participants were asked to rate the extent to which the items for both of the scales are true for them on a 7-point Likert-type scale (7 = very true; 1 = not at all true). Previous research has reported Cronbach's alphas averaging .94 (Black & Deci, 2000; Williams & Deci, 1996; Williams, Saizow, Ross, & Deci, 1997; Williams, Wiener, Markakis, Reeve, & Deci, 1994). In the present study the scale demonstrated acceptable reliability at all three time points ( $\alpha = .90, .90, \text{ and } .91$ ).

Additionally, a modified version of the Support of Autonomy subscale (Zook & Herman, 2011) was used to assess perceived autonomous advising. This scale contains six items, two of which are reverse-scored. An example item is, "I am allowed to develop my own ideas in advising sessions." Participants were asked to rate the extent to which the items for both of the scales are true for them on a 7-point Likert-type scale (7 = very true; 1 = not at all true). In the development stage of this subscale, the Cronbach's alpha was reported at .71. In the present study the scale demonstrated poor reliability at all three time points ( $\alpha = .39, .19, \text{ and } .34$ ); therefore, only items from the Learning Climate Questionnaire were used to assess autonomous advising support.

### **Competence-Supportive Advising**

A modified version of the Support of Competence subscale (Zook & Herman, 2011) assessed participants' perceptions of competence-supportive advising (10 items). An example item is, "My advisor is always willing to provide help." Two items were reverse-scored. Participants were asked to report the extent to which items are true for them on a 7-point Likert-

type scale (7 = very true; 1 = not at all true). The authors reported Cronbach's alpha at .91 for this subscale. In the present study, Cronbach's alpha was .92, .92, and .95 for each of the three time points.

### **Relatedness-Supportive Advising**

A modified version of the Teacher Involvement subscale of the student report of Teacher as Social Context Questionnaire-Short Form (Belmont, Skinner, Wellborn, & Connell, 1988) assessed participants' perceptions of relatedness-supportive advising (8 items). Three items were reverse-scored. The items measured students' perceptions of their advisor as affectionate, dedicated, dependable, and understanding. An example is, "My advisor really cares about me." Participants were asked to report the extent to which items are true for them on a 7-point Likert-type scale (7 = very true; 1 = not at all true). The authors reported Cronbach's alpha at .80 for this subscale. In the present study, Cronbach's alpha was .83, .86, and .87 at each of the three time points.

### **Need Satisfaction**

A modified version of the Basic Psychological Needs Satisfaction at Work Scale (Ilardi, Leone, Kasser, & Ryan, 1993) assessed the extent to which participants' needs for autonomy, competence, and relatedness are satisfied within the advising relationship (21 items). Eight items were reverse-scored. Example items include "I am free to express my ideas and opinions in advising sessions" (autonomy), "My advisor tells me I am good at coursework and tasks" (competence), and "My advisor cares about me" (relatedness). Participants were asked to report the extent to which items are true for them on a 7-point Likert-type scale (7 = very true; 1 = not at all true). Total need satisfaction was assessed by averaging all of the items. Previous research has reported an average Cronbach alpha of .83 for the overall scale (Deci et al., 2001; Gagné, 2003; Kashdan, Julian, Merritt, & Uswatte, 2006). In the present study, Cronbach's alpha was .89, .86, and .88 at each of the three time points.

### **Autonomous Major Decision-Making**

An adapted version of the Career Decision-Making Autonomy Scale (Guay, 2005) was used to assess students' autonomy for making decisions about their academic major. The scale includes seven activities, for example, "seeking information on academic major programs." Participants were asked to rate the extent to which they are engaging, or would engage, in the activities, on a 7-point Likert-type scale (7 = very true; 1 = not at all true), based on intrinsic motivation (i.e., for the pleasure of doing it), identified regulation (i.e., because they believe that the activity is important), introjected regulation (i.e., because they would feel guilty and anxious if they did not perform the activity), and extrinsic motivation (i.e., because somebody else wants them to do it or because they would get something from somebody if they did it). A perceived autonomy index (PAI) was computed for each activity using this formula: (intrinsic motivation + identified regulation) - (introjected regulation + extrinsic motivation). The PAI for each activity was averaged together to create a total PAI, with higher scores indicating enhanced autonomous regulation toward academic major decision-making. Cronbach's alphas ranged between .91 and .95 for the subscales. Prior research also established the construct validity of the scale (Guay, 2005). In the present study Cronbach's alpha for the intrinsic motivation subscale was .96, .94 and .95 at each of the three time points. Cronbach's alpha for the identified motivation subscale was .92, .94 and .95 at each of the three time points. Cronbach's alpha for the introjected motivation subscale was .92, .91 and .95 at each of the three time points. Cronbach's alpha for the extrinsic motivation subscale was .97, .95 and .96 at each of the three time points.

### **Competent Major Decision-Making**

An adapted version of the Career Decision Self-Efficacy Scale-Short Form (Betz, Hammond, & Moulton; Betz & Klein, 1996) measured students' competence toward major decision-making. The instrument includes 25 items dispersed among five subscales: Self-Appraisal, Occupational Information, Goal Selection, Planning, and Problem Solving. The self-appraisal subscale measures one's confidence toward accurately evaluating one's abilities, such



as to “define the type of lifestyle you would like to live.” The occupational information subscale assesses one’s confidence toward collecting information, for example, “us[ing] the internet to find information about majors that interest you.” Goal selection items measure one’s confidence in “select[ing] one major from a list of potential majors you are considering”, for example. In the planning subscale, items assess participants’ confidence in planning for the future with items such as, “mak[ing] a plan of your goals for the next five years.” Lastly, items measuring problem solving confidence include “chang[ing] majors if you did not like your first choice” and similar items. Participants were asked to indicate the level of confidence he/she feels they could complete the list of items. The levels of confidence are similar to a 5-point Likert-type scale (5 = complete confidence; 1 = no confidence at all). All items were averaged together to create a score of competent major decision-making. Reliability coefficients for the subscales have ranged from .80 to .87, with full scale reliabilities averaging .96 (Hartman & Betz, 2007). A number of studies have supported the measures’ content, construct, and criteria-related validities (see Betz & Luzzo, 1996, for a review). In the present study, Cronbach’s alpha was .96, .97 and .98 at each of the three time points.

### **Academic Satisfaction**

Satisfaction toward one's courses was assessed using an academic satisfaction scale created by Lent and colleagues (Lent et al., 2005). The scale contains six items. An example item is, “I am generally satisfied with my academic life.” Participants were asked to rate how true each item is for them on a 7-point Likert-type scale (7 = very true; 1 = not at all true). Previous research has reported reliability coefficients averaging at .88 (Lent et al., 2005; Lent, Singley, Sheu, Schmidt, & Schmidt, 2007; Ojeda, Flores, & Navarro, 2011). In the present study, Cronbach’s alpha was .91, .93 and .93 at each of the three time points.

### **Academic Self-Efficacy**

The academic efficacy subscale from the Patterns of Adaptive Learning Scales (PALS; Midgley et al., 2000) was used (5 items). An example item is, “I can do even the hardest work in

my courses if I try.” Participants were asked to rate how true each item is for them on a 7-point Likert-type scale (7 = very true; 1 = not at all true). The authors report acceptable reliability ( $\alpha = .78$ ; Midgley et al., 2000). In the present study, Cronbach’s alpha was .90, .91 and .91 at each of the three time points.

### **Task Value**

Value related to tasks in one’s coursework was assessed with six items adapted from a subjective task value scale developed by Wigfield and colleagues (Wigfield et al., 1997). Two items assessed each of the following: intrinsic value (i.e., how interesting or fun doing the work for courses is), attainment value (i.e., how important students thought being good at their courses is), and utility value (i.e., how useful what they were learning in courses is). An example item from this scale is, “I believe my courses will be beneficial to me.” Participants were asked to indicate how true each item is for them on a 7-point Likert-type scale (7 = very true; 1 = not at all true). Prior research has suggested the scale has acceptable reliability across the three factors ( $\alpha = .64$  on average) over a three-year study in various domains (Wigfield et al., 1997). Previous research has demonstrated excellent face, predictive, and discriminate validity (see Eccles, O’Neill, & Wigfield, 2005, for a review). In the present study, Cronbach’s alpha was .83, .89 and .89 at each of the three time points.

### **Subjective Well-Being**

An aggregate subjective well-being (SWB) score was created for each participant using the Positive Affect Negative Affect Schedule (PANAS; Watson, Tellegen, & Clark, 1988) and the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, Griffin, 1985). Research has shown these three (positive affect, negative affect, and life satisfaction) constructs are essential components of SWB (Diener, 1984; 1994).

The PANAS measured participants’ recent happiness and unhappiness by rating their experience of 20 mood adjectives (e.g., 10 positives such as “excited” and “inspired” and 10 negatives such as “upset” and “nervous”) using a 5-point Likert-type scale (5 = very much; 1 =

not at all). Participants were asked to rate their affect since the first day of class (time 1), during the fall semester (time 2), and during the spring semester (time 3).

The SWLS measured participants' overall satisfaction with life at each time point (i.e., "The conditions of my life are excellent") by asking them to rate the extent to which each of the five items are true for them using a 7-point Likert-type scale (7 = very true; 1 = not at all true). The SWB score was computed by summing the standardized positive affect and life satisfaction scores, then subtracting the standardized negative affect score from this total, at each time point. Previous research has reported an average Cronbach's alpha of .85 for this composite score of SWB (Elliot & Sheldon, 1997; Sheldon, Gunz, Nichols, & Ferguson, 2010; Sheldon & Krieger, 2004; Sheldon & Niemiec, 2006; Sheldon, Ryan, Deci, & Kasser, 2004). In the present study, Cronbach's alpha for the composite score was .95, .93, and .96 at each time point.

All scales are available in Appendices D through O.

#### **DESIGN AND PROCEDURES**

This study was conducted using a longitudinal design in order to uncover the consistency in students' basic need satisfaction, autonomous and competent academic major decision-making, satisfaction, academic efficacy, value, subjective well-being, and future intention over time as a function of need-supportive advising. Participants were asked to complete an online survey at three time points throughout the 2012-2013 and 2013-2014 academic years: the beginning of the fall semester (time 1, T1), beginning of the spring semester (time 2, T2), and end of the spring semester (time 3, T3). Students in the School of Undergraduate Studies are typically assigned to 1 of 13 advisors from the Vick Center for Strategic Advising and Career Counseling upon enrollment and meet with the same advisor while in the department (D. Spight, personal communication, July 23, 2012). Therefore, these students should have reported on experiences with the same advisor at all assessment points.

Qualtrics was the survey platform used in the present study. Once the pool of participants were assigned to (or had volunteered to complete) this study, they were sent an email briefly

describing the study and provided a URL to the study website. Clicking on the URL sent them to an introductory page giving more details of the study in the form of an informed consent document (Appendix B). At the end of the description, they were asked whether or not they wished to proceed. If subject pool participants declined, they were be sent to a page directing them to contact the subject pool coordinator for the alternative assignment option. If the student agreed, it was assumed him or her were consenting to participate and proceeded to the survey instruments. At the end of the survey, students were asked to include their email address so they could be contacted to complete the surveys at times 2 and 3. The survey at all three time points included measures of: supportive advising, need satisfaction, autonomous regulation toward decision-making, competent decision-making, subjective well-being, academic satisfaction, academic efficacy, and value. Additionally, each time point included demographics and items assessing number of advising sessions completed, number of majors declared in the past, what major, if any, had been chosen, likelihood of pursuing career related to major, and time to degree completion. Total time for completion of each survey was approximately 30 minutes. During the 2012-2013 academic year 5 participants at time point 1 and 10 participants at time point 3 were randomly selected to receive a \$20 Amazon.com giftcard through email. Students participating in the 2013-2014 academic year received \$5 at time point 1, \$6 at time point 2, and \$10 at time point 3.

## Chapter 4: Results

Due to the low number of participants for all three time points ( $n = 94$ ), models including just two time points were used to assess the hypotheses ( $n = 148$ ). Models using three time points were also explored and those results will be presented as well.

### TWO TIME POINT MODEL

A two time point model was estimated to explore hypotheses 1a, 2a, and 3a regarding stability over time. First, the distribution of scores of each variable was examined for statistical outliers. Grubbs' (1950) test was applied and identified outliers were set at the value of their nearest neighbor. One outlier, each, was found for the autonomous need satisfaction, autonomous decision-making, and subjective well-being measures and were Winsorized. Means and standard deviations for all of the variables are presented in Table 2.

All analyses were performed using Mplus (version 6.12) statistical software (Muthén & Muthén, 2010). First, simple bivariate correlations were examined among the variables within each time point (see Tables 3, 4, and 5). The correlations between each of the need support variables were considerably high, ranging from .77 to .91 across both time points; therefore, they were combined to create a single need support variable (Time 1  $M = 5.10$ ; Time 2  $M = 5.13$ ). The correlations between each of the need satisfaction variables were strong but not as high, ranging from .52 to .71 across both time points, and were kept separate.

A number of fit indices were used to assess goodness-of-fit. Chi-square ( $\chi^2$ ), along with degrees of freedom, tested the probability that the data were not consistent with the model. Therefore,  $\chi^2$  should not be statistically significant. Additionally, the comparative fit index (CFI), which provided an estimate of the deviation from the null hypothesis model, and Tucker-Lewis index (TLI), which adjusted for parsimony, were used. Root-mean-square error of approximation (RMSEA) and standardized root mean square residual (SRMR) both measured the fit of the data using the difference between the estimated and implied covariance matrices (e.g., Keith, 2006). Hu and Bentler (1999) provided values which specify good model fit for the above mentioned

indices. Specifically, CFI and TLI should be .95 or above, while RMSEA and SRMR should be .06 or below for good model fit. Values of .90 for CFI and TLI, .08 for RMSEA and .10 for SRMR indicate moderate fit.

The relationship between need-supportive advising and academic satisfaction, academic efficacy toward coursework, value toward coursework, subjective well-being, and future intention to pursue a career related to academic major, over time, as explained by a series of variables, including need satisfaction, and autonomous and competent decision-making toward an academic major was examined. To test the hypotheses, path analyses was conducted using maximum likelihood procedures. A model in which the following paths for both time points were estimated: need-supportive advising to autonomous, competence, and relatedness need satisfaction; advising and each need satisfaction to autonomous and competent decision-making; advising, need satisfaction, autonomous and competent decision-making to academic satisfaction, academic efficacy, value, subjective well-being, and future intention, respectively. The correlations between each form of need satisfaction, autonomous and competent decision-making, and each of the outcomes were also estimated for both time points. In order to test the effect of advising over time, paths from each variable at time point 1 to itself at time point 2, as well as the paths from each variable at time point 1 to each subsequent variable at time point 2 (for example, from autonomous need satisfaction at time point 1 to autonomous and competent decision-making and all of the outcomes at time point 2), were estimated. All continuous predictor variables were centered.

The model produced moderate to poor model fit ( $\chi^2(69) = 195.81$ ,  $p < .001$ , CFI = .96, TLI = .86, RMSEA = .11, SRMR = .11). Modification indices larger than 3.84 (3.84 is the critical value of  $\chi^2(1)$ ,  $p < .05$ ) were examined to consider adding paths to the model to improve model fit. The following paths were added based on theory: autonomous decision-making at time point 1 to need-supportive advising and competence need satisfaction at time point 2, competent decision-making at time 1 to competence need satisfaction and autonomous decision-making at

time 2, academic satisfaction at time 1 to competence need satisfaction, autonomous decision-making, and subjective well-being at time 2, academic efficacy at time 1 to competence need satisfaction, autonomous decision-making, and subjective well-being at time 2, value at time 1 to competence need satisfaction at time 2, subjective well-being at time 1 to need-supportive advising, competence need satisfaction, autonomous and competent decision-making, and academic satisfaction at time 2. The model with these added paths produced acceptable fit ( $\chi^2(53) = 71.06$ ,  $p = .05$ , CFI = .99, TLI = .97, RMSEA = .05, SRMR = .03). A chi-square difference test comparing this model to the nested model excluding the added paths provided support for the model with the added paths ( $\chi^2_{\text{diff}}(16) = 124.75$ ,  $p < .001$ ). Table 6 lists the standardized coefficients and standard errors for the direct effects in this full model.

The following direct paths were not statistically significant for time 1 predictors: need-supportive advising at time 1 to autonomous and competence decision-making, academic satisfaction, value, academic efficacy, subjective well-being, and future intention at time 1 and all of the variables at time 2; autonomous need satisfaction at time 1 to competence decision-making, academic satisfaction, academic efficacy, value, subjective well-being, and future intention at time 1, autonomous and competent decision-making and all of the outcomes at time 2; competence need satisfaction at time 1 to all of the outcomes at time 1 and competence need satisfaction and all of the outcomes at time 2; relatedness need satisfaction at time 1 to autonomous and competent decision-making, academic satisfaction, academic efficacy, value, and future intention at time 1, relatedness need satisfaction, autonomous and competent decision-making, and all of the outcomes at time 2; autonomous decision-making at time 1 to academic efficacy and future intention at time 1, need-supportive advising, competent need satisfaction, autonomous decision-making, and all of the outcomes at time 2; competent decision-making at time 1 to future intention at time 1, competence need satisfaction, autonomous and competent decision-making, subjective well-being and future intention at time 2; academic satisfaction at time 1 to competence need satisfaction, autonomous decision-making, academic satisfaction, and

subjective well-being at time 2; academic efficacy at time 1 to competence need satisfaction, autonomous decision-making, and academic efficacy at time 2; value toward coursework at time 1 to competence need satisfaction and value at time 2; subjective well-being at time 1 to need-supportive advising at time 2; and future intention at time 1 to future intention at time 2.

The following direct paths were not significant for time 2 predictors: need-supportive advising to autonomous and competent decision-making, academic satisfaction, academic efficacy, value, subjective well-being, and future intention at time 2; autonomous need satisfaction to competent decision-making and all of the outcomes, except future intention, at time 2; competence need satisfaction to autonomous decision-making and all of the outcomes at time 2; relatedness need satisfaction to autonomous and competent decision-making and all of the outcomes at time 2; autonomous decision-making to academic satisfaction, academic efficacy, and value at time 2; and competent decision-making to subjective well-being and future intention at time 2. Two paths approached significance: autonomous need satisfaction to need-supportive advising at time 2 ( $p = .056$ ) and competent decision-making at time 1 to future intention at time 1 ( $p = .052$ ). All other direct paths and correlations were significant. A model without the non-significant paths including the two paths which were close to significant was estimated. This model produced acceptable fit ( $\chi^2(142) = 181.50, p < .05, CFI = .99, TLI = .98, RMSEA = .04, SRMR = .08$ ). A chi-square difference test comparing this model to the fuller model including the non-significant paths provided support for the trimmed model ( $\chi^2_{diff}(89) = 110.44, p = .06$ ), suggesting that the more parsimonious model should be retained. Additionally, the following paths were not significant in the parsimonious model: autonomous need satisfaction at time 1 to need-supportive advising at time 2 ( $p = .118$ ), competence need satisfaction at time 1 to competent decision-making at time 2 ( $p = .303$ ), relatedness need satisfaction at time 1 to subjective well-being at time 1 ( $p = .253$ ), autonomous need satisfaction at time 2 to future intention at time 2 ( $p = .083$ ). Figure 1 illustrates the final model with statistically significant standardized coefficients and standard errors for the direct effects.



Next, indirect effects were estimated by including the INDIRECT statement in Mplus. Bootstrap estimates based upon 5000 resamples were obtained to investigate each direct effect. Bootstrap confidence intervals suggested that all but one of the significant indirect effects were likely to be positive with 95% confidence. The indirect path from need-supportive advising at time 1 to subjective well-being at time 2 through competence need satisfaction, competent decision-making, and academic efficacy at time 1 was negative with 95% confidence. The following indirect paths were not significant for time 1 predictors: need-supportive advising at time 1 to academic satisfaction, academic efficacy, and value at time 2, respectively, through competence need satisfaction at time 1 and competent decision-making at time 2; need-supportive advising at time 1 to value at time 2 through competence need satisfaction, competent decision-making, and subjective well-being at time 1 and competence need satisfaction and competent decision-making at time 2; and need-supportive advising at time 1 to future intention at time 2 through competence need satisfaction at time 1 and autonomous decision-making at time 2. All indirect paths from need-supportive advising at time 2 to future intention at time 2 were not significant. Additionally, all indirect paths that included relatedness need satisfaction at time 1 were not significant. All indirect paths that included autonomous need satisfaction and decision-making at time 1 as mediators were not significant, as well. Lastly, all indirect paths that included autonomous decision-making and subjective well-being at time 1 as mediators were not significant, except the paths from need-supportive advising at time 1 to academic satisfaction and value at time 2.

The hypotheses for each separate time point were mostly supported. Specifically, at time 1, competence need satisfaction and autonomous and competent decision-making, separately, mediated the effects of need-supportive advising on all of the outcomes, such that more need-supportive advising significantly predicted greater competence need satisfaction, which in turn significantly predicted greater autonomous and competent decision-making toward an academic major. Autonomous and competent decision-making in turn, predicted greater academic

satisfaction, value, subjective well-being, and future intention. Competent decision-making predicted greater academic efficacy. At time 2, competence need satisfaction and competent decision-making mediated the effects of need-supportive advising at time 2 on academic satisfaction, academic efficacy, and value. Also, autonomous need satisfaction and autonomous decision-making at time 2 mediated the effects of need-supportive advising on subjective well-being at time 2. Need-supportive advising significantly predicted greater autonomous and competence need satisfaction, respectively, which in turn predicted greater autonomous and competent decision-making, respectively. Autonomous decision-making predicted greater subjective well-being, while competent decision-making predicted greater academic satisfaction, academic efficacy, and value. Unexpectedly, the path from need-supportive advising to future intention through autonomous need satisfaction was negative ( $p = .051$ ).

Hypothesis 1a, 2a, and 3a regarding effects over time were mostly supported. Need-supportive advising at time 1 predicted academic satisfaction, academic efficacy, value and subjective well-being at time 2 through multiple pathways. Contrary to the results from the 3 time point models, the only variable to predict itself in the future was subjective well-being. Other unexpected significant direct paths emerged. Specifically, subjective well-being at time 1 predicted greater competence need satisfaction, autonomous and competent decision-making, and academic satisfaction at time 2. Academic efficacy at time 1 negatively predicted subjective well-being at time 2. Also, competence need satisfaction at time 1 negatively predicted autonomous and competent decision-making at time 2. Table 7 lists standardized coefficients, standard errors, and confidence intervals for the indirect paths.

### **THREE TIME POINT MODEL**

Smaller models were tested using the data collected over 3 time points to explore the hypotheses. Grubbs' (1950) test was applied to examine statistical outliers. One outlier, each, was found for the autonomous need satisfaction and autonomous decision-making and were Winsorized. Means and standard deviations for all of the variables are presented in Table 8.

All analyses were performed using Mplus (version 6.12) statistical software (Muthén & Muthén, 2010). Simple bivariate correlations were examined among the variables within each time point (see Tables 9, 10, 11, and 12). The correlations between each of the need support variables were considerably high, ranging from .78 to .91 across both time points; therefore, they were combined to create a single need support variable. The correlations between each of the need satisfaction variables were strong but not as high, ranging from .47 to .74 across both time points, and were kept separate.

### **Hypothesis 1**

The first simplified model examined the effect of need-supportive advising on autonomous, competence, and relatedness need satisfaction, at each time point, as well as across time points. Correlations between each need satisfaction at each time point were included in the model. This model produced moderate fit ( $\chi^2(27) = 41.37, p = .04, CFI = .99, TLI = .97, RMSEA = .08, SRMR = .05$ ). The path from autonomous need satisfaction at time 1 to supportive advising at time 2 was added based on modification indices and theory. This model produced acceptable fit ( $\chi^2(26) = 35.72, p = .10, CFI = .99, TLI = .98, RMSEA = .05, SRMR = .04$ ). A chi-square difference test comparing this model to the original model provided support for the model with the added path ( $\chi^2_{diff}(1) = 5.65, p < .05$ ). The following direct paths were not statistically significant: supportive advising at time 1 to autonomous need satisfaction at time 2 and autonomous, competence, and relatedness need satisfaction at time 3; autonomous need satisfaction at time 1 to autonomous need satisfaction at times 2 and 3; competence need satisfaction at time 1 to competence need satisfaction at time 3; relatedness need satisfaction at time 1 to relatedness need satisfaction at time 3; and supportive advising at time 2 to autonomous and competence need satisfaction at time 3. A model excluding these direct paths was estimated and produced moderate fit ( $\chi^2(34) = 57.39, p < .01, CFI = .98, TLI = .96, RMSEA = .09, SRMR = .06$ ). A chi-square difference test comparing this model to the full model including the non-significant paths provided support for the full model ( $\chi^2_{diff}(7) = 16.01, p < .05$ ). Table 13 lists

standardized coefficients and standard errors for the full model. Figure 2 illustrates the final model with significant standardized coefficients and standard errors for the direct effects.

Hypotheses 1 was fully supported. Namely, at each time point, need-supportive advising positively predicted autonomous, competence, and relatedness need satisfaction. Unexpectedly, the following negative direct effects emerged: need-supportive advising at time 1 to competence and relatedness need satisfaction at time 2, autonomous need satisfaction at time 1 to supportive advising at time 2, and need-supportive advising at time 2 to relatedness need satisfaction at time 3. Each variable significantly predicted itself at each future time point, except for autonomous need satisfaction which only predicted from time 2 to 3.

## **Hypothesis 2**

Next, the relations between each type of need satisfaction and autonomous and competence decision-making, at and across each time point were examined. The model included correlations between each need satisfaction and both types of decision-making at each time point. This model produced moderate fit ( $\chi^2(42) = 92.53, p = .42, CFI = .93, TLI = .85, RMSEA = .11, SRMR = .09$ ). The following paths were added based on modification indices and theory: competence need satisfaction at time 1 to autonomous need satisfaction at times 2 and 3, relatedness need satisfaction at time 1 to autonomous need satisfaction at time 2, autonomous need satisfaction at time 2 to competence need satisfaction at time 3, and autonomous decision-making at time 2 to autonomous need satisfaction at time 3. This model produced moderate fit ( $\chi^2(36) = 60.47, p < .01, CFI = .97, TLI = .91, RMSEA = .09, SRMR = .06$ ). A chi-square difference test comparing this model to the original model provided support for the model with the added paths ( $\chi^2_{diff}(6) = 32.06, p < .05$ ). The following direct paths were not statistically significant: autonomous need satisfaction at time 1 to autonomous need satisfaction at times 2 and 3, autonomous and competent decision-making at times 1 and 3, and competent decision-making at time 2; competence need satisfaction at time 1 to autonomous need satisfaction at times 2 and 3 and autonomous and competence decision-making at times 2 and 3; relatedness

need satisfaction at time 1 to autonomous decision-making at time 1 and autonomous need satisfaction at time 2, autonomous and competent decision-making at times 2 and 3, and relatedness need satisfaction at time 3; competent decision-making at time 1 to itself at time 3; autonomous need satisfaction at time 2 to autonomous and competent decision-making at times 2 and 3; competence need satisfaction at time 2 to autonomous and competent decision-making at time 3; relatedness need satisfaction to autonomous and competent decision-making at times 2 and 3; and autonomous and relatedness need satisfaction at time 3, respectively, to autonomous and competent decision-making at time 3. A model excluding these direct paths was estimated and produced poor fit ( $\chi^2(68) = 144.07, p < .001, CFI = .91, TLI = .86, RMSEA = .11, SRMR = .12$ ). A chi-square difference test comparing this model to the fuller model including the non-significant paths provided support for the fuller model ( $\chi^2_{diff}(26) = 51.54, p < .05$ ). Table 14 lists standardized coefficients and standard errors for the fuller model. Figure 3 illustrates the final model with standardized coefficients and standard errors for the direct effects.

Hypothesis 2 was mostly supported. Competence need satisfaction at each time point significantly positively predicted autonomous and competent decision-making at each time point. Additionally, autonomous need satisfaction at time 1 predicted autonomous decision-making at time 2, autonomous decision-making at time 1 predicted competence need satisfaction at time 2, autonomous need satisfaction at time 2 predicted competence need satisfaction at time 3, and autonomous decision-making at time 3 predicted autonomous need satisfaction at time 3. Unexpectedly, relatedness need satisfaction negatively predicted competent decision-making at time 1. Each variable significantly predicted itself at each future time point, except for autonomous need satisfaction which only predicted from time 2 to 3.

### **Hypothesis 3**

The last model examined the paths between each type of decision-making and academic satisfaction, value toward coursework, academic efficacy, subjective well-being, and future intention at and across all three time points. The model also included correlations between each

decision-making variable and all of the outcomes at each time point. This model produced moderate fit ( $\chi^2(96) = 150.89$ ,  $p < .001$ , CFI = .97, TLI = .93, RMSEA = .08, SRMR = .07). Modification indices and theory suggested the following paths be added to the model: competent decision-making at time 1 to autonomous decision-making at time 2, academic efficacy at time 1 to future intention at time 2, subjective well-being at time 1 to competent decision-making at times 2 and 3, future intention at time 1 to academic satisfaction and value at time 2, academic efficacy at time 2 to value at time 3, subjective well-being at time 2 to autonomous decision-making at time 3, and future intention at time 2 to subjective well-being at time 3. This model produced good fit ( $\chi^2(87) = 99.93$ ,  $p = .16$ , CFI = .99, TLI = .98, RMSEA = .04, SRMR = .04). A chi-square difference test comparing this model to the original model provided support for the model including the additional paths ( $\chi^2_{\text{diff}}(9) = 50.96$ ,  $p < .001$ ). The following direct paths were not statistically significant: autonomous decision-making at time 1 to academic efficacy and future intention at time 1, academic satisfaction, academic efficacy, value, subjective well-being, and future intention at times 2 and 3; competent decision-making at time 1 to competent decision-making at time 3 and all of the outcomes at times 2 and 3; academic efficacy at time 1 to itself at time 3; value at time 1 to itself at time 3; autonomous decision-making at time 2 to academic satisfaction, value, and future intention at time 2 and all of the outcomes at time 3; competent decision-making at time 2 to value and future intention at time 2 and academic satisfaction, academic efficacy, value, and future intention at time 3; autonomous decision-making at time 3 to academic satisfaction, academic efficacy, value and future intention at time 3; and competent decision-making at time 3 to value and future intention at time 3. A model excluding the non-significant direct paths was estimated and produced poor fit ( $\chi^2(132) = 169.78$ ,  $p < .05$ , CFI = .97, TLI = .96, RMSEA = .06, SRMR = .09). A chi-square difference test comparing this model to the fuller model including the non-significant paths provided support for the fuller model ( $\chi^2_{\text{diff}}(45) = 69.85$ ,  $p < .05$ ). Table 15 lists standardized coefficients and

standard errors for the full model. Figure 4 illustrates the final model with standardized coefficients and standard errors for the direct effects.

Hypothesis 3 was partially supported. Each variable significantly predicted itself at each future time point. At time 1 autonomous decision-making predicted academic satisfaction, value and subjective well-being, while competent decision-making significantly predicted all of the outcomes. At time 2, autonomous decision-making predicted academic efficacy and subjective well-being, while competent decision-making predicted academic satisfaction, academic efficacy, and subjective well-being. At time 3 autonomous decision-making predicted subjective well-being, while competent decision-making predicted academic satisfaction, academic efficacy, and subjective well-being. However, value and future intention at times 2 and 3 were not predicted by autonomous and competent decision-making.

## **Chapter 5: Discussion**

The present study examined the relation between need-supportive advising and academic- and motivation-related outcomes, as expressed through basic need satisfaction and autonomous and competent decision-making. Given the parallel between advising and teaching (e.g., C. Ryan, 1992; Hemwall & Trachte, 2005), this research sought to answer questions which have been explored typically in classroom settings (e.g. Jang, Reeve, & Deci, 2010). Overall, the results suggest advising which supports students' needs for autonomy, competence, relatedness does lead to greater academic satisfaction, efficacy and value toward coursework, and subjective well-being, over time, through increased feelings of competence toward advising and decision-making about their academic major.

### **HYPOTHESIS 1 AND 1A**

Results from both the 3 and 2 time point models indicate need-supportive advising significantly predicted satisfaction of all three basic psychological needs: autonomy, competence, and relatedness. Specifically, at each time point students felt engaged in advising because it was personally relevant, it would be academically beneficial, and they felt supported by their advisors when their advisors used autonomy-, competence-, and relatedness-supportive practices. This finding is line with a long history of research demonstrating the benefits of need supportive environments.

However, results for hypothesis 1a were mixed. In the 3 time point model need-supportive advising predicted itself at each future time point. In model 1, competence and relatedness need satisfaction predicted themselves at each future time point while autonomous need satisfaction only predicted itself from time 2 to time 3. However, in model 2, each form of need satisfaction predicted itself at each time point and autonomous and competence need satisfaction predicted themselves at time 3 from time 1. In the 2 time point model, need-supportive advising and need satisfaction did not predict themselves at the second time point. Perhaps students' perceptions of their advisors as need-supportive and satisfying of their basic



psychological needs remains stable over time when multiple time points are taken into account. Additionally, the differences between the models may be due to the fact that the 2 time point model included all of the variables.

Additionally, a number of negative paths emerged. Need-supportive advising at time 1 negatively predicted competence need satisfaction at time 2. These results suggest that when students experienced advising which supported their needs of autonomy, competence, and relatedness at the beginning of the fall semester, they felt less competent during advising sessions at the beginning of the spring semester. Researchers who have examined undecided students have attempted to categorize these students based on their level of indecision. Chartrand and her colleagues (1994) identified four clusters of undecided students: *developmentally undecided*, *ready to decide*, *indecisive*, and *choice anxious*. Those who labeled as indecisive reported low self-esteem and confidence in their ability to explore information about careers and evaluate their own career interests. These students seek more information but also experience anxiety about the decision-making process. In the present study, the students at time 2 may have been at the indecisive stage and the need-supportive advising they received at time 1 did not positively impact their needs during their second semester.

Need-supportive advising at times 1 and 2 negatively predicted relatedness need satisfaction at times 2 and 3, respectively. Although students typically meet with the same advisor, perhaps students met with a different advisor at the different time points which led to a negative effect across time, while the effect at the same time point was positive. Another negative path suggested that the more perceived autonomy students felt at time 1 negatively predicted need-supportive advising at time 2. Undecided/undeclared students are required to meet with an advisor to register for the upcoming semester and at least twice a semester to discuss major exploration (“Academic Advising,” n.d.). It is possible that students felt their advisors were less need supportive at time 2 because advisors were more directive about students’ choices and degree planning throughout the fall semester. Indeed, advising theorists

have recommended intensive and intrusive advising students during the major exploration process (Gordon, 1995, 2007; Steele, 2003). Additionally, these negative paths could be the result of a missing mediator variable that could be suppressing the effect of first variable on the other variable at a future time point. It is important to note that these negative paths did not emerge in the 2 time point model.

## **HYPOTHESIS 2 AND 2A**

Results from the 3 time point model indicate that at each time point competence need satisfaction predicted autonomous and competent decision-making. That is, the more students felt a sense of accomplishment in the context of their academic advising session, the more likely they were to find personal value in and feel capable engaging in academic major decision-making tasks. The 2 time point model demonstrated a slightly different pattern of findings. At time 1 competence need satisfaction predicted both forms of decision-making, while at time 2 autonomous need satisfaction predicted autonomous decision-making and competence need satisfaction predicted competent decision-making. These results align with a long history of motivation research (e.g., Deci, et al., 1981). However, in the 3 time point model, relatedness need satisfaction negatively predicted competent decision-making at time 1. It appears when students felt closer to their advisor they reported feeling less confident in their academic major decision-making. This finding seems counterintuitive and is not in line with theory. Timing may have been a factor. At time 1 (near the beginning of the fall semester) most students would have only had one advising session with their advisor during new student orientation in the summer. It is also likely that this result is a spurious effect.

Again, support for stability over time is inconsistent. In the 3 time point model, competence and relatedness need satisfaction and autonomous and competent decision-making predicted themselves at the consecutive time point. Autonomous need satisfaction only predicted itself from time 2 to 3. Autonomous and competence need satisfaction, as well as autonomous decision-making, at time 1 also predicted themselves at time 3. However, none of the variables at

time 1 impacted their counterpart at time 2 in the 2 time point model. Additional notable direct effects emerged in both models. In the 3 time point model autonomous need satisfaction at time 1 positively predicted autonomous decision-making at time 2 suggesting that when students felt their advisors provided them with more choices during the fall semester students enjoyed exploring major options in the spring. Also, autonomous decision-making at time 1 predicted competence need satisfaction at time 2 suggesting that when students enjoyed decision-making tasks in the fall they felt more competent during advising sessions in the spring. Another significant path from autonomous decision-making at time 2 to autonomous need satisfaction at time 3 suggests that when students enjoyed engaging in decision-making tasks at the beginning of the spring semester they felt autonomous during sessions toward the end of the semester. Also, autonomous need satisfaction at time 2 predicted competence need satisfaction at time 3, as well as competence need satisfaction at time 1 predicted autonomous need satisfaction at time 3. These paths suggest that when students were engaged in advising at the beginning of the spring which they felt was personally endorsed and helped them feel confident at the beginning of the fall semester influenced feelings of confidence and self-endorsement regarding advising at the end of the spring semester. In the 2 time point model, two negative paths implied that when students reported greater perceived competence at time 1, they felt less autonomous and competent about major decision-making at time 2. Similarly, in a study conducted by Hollembeak and Amorose (2005) student athletes reported lower perceived competence toward sports when they received more positive feedback from their coaches. The researchers asserted that these students felt less confident in their abilities because the high praise they received from coaches was inappropriate. Feedback is one of the components of competence need satisfaction. In the present study, students may have viewed the feedback they received from advisors at time 1 as inappropriate which influenced their feelings toward decision making at time 2. This seems likely because at time 1 the students may not have had enough contact with their advisors to elicit appropriate feedback regarding the students' abilities. Another possible explanation for this

could be that although the students felt confident during initial advising sessions, later in the academic year they felt pressured and less confident engaging in major decision-making tasks.

### **HYPOTHESIS 3 AND 3A**

In the 3 time point model, at time 1 autonomous decision-making predicted academic satisfaction, value toward coursework, and subjective well-being, while competent decision-making predicted academic satisfaction, efficacy and value toward coursework, subjective well-being, and future intention to pursue a career related to their major. At time 2 of the model, autonomous decision-making predicted academic efficacy and subjective well-being, while competent decision-making predicted academic satisfaction, academic efficacy, and subjective well-being. At time 3, autonomous decision-making predicted subjective well-being, while competent decision-making predicted academic satisfaction, academic efficacy, and subjective well-being. At time 2 and 3, value and future intention were not predicted by either form of decision-making. Value toward coursework may have not been associated with major decision-making as the study progressed because undecided and first-year students generally complete core curriculum or general education courses. These courses are theorized to create “well-rounded” individuals; however, students may not see the value in these courses as a part of their complete degree and may not think they connect with their future majors (Humphreys & Davenport, 2005). Future intention may not have been influenced by autonomous and competent decision-making because students likelihood to pursue their career of interest is not associated with how engaged in the decision-making process they are. The model provides support for this claim. Academic efficacy at time 1 predicted future intention at time 2 indicating that when students felt more confident in their classes they later felt more likely to pursue their future career.

The findings between both models are slightly inconsistent. Time 1 of the 2 time point model was consistent with time 1 of the 3 time point model. However, in time 2 of the 2 time point model, autonomous decision-making predicted subjective well-being and future intention,

while competent decision-making predicted academic satisfaction and efficacy and value toward coursework. It is unknown which of the effects are spurious, due to timing factors, or sample size. A notable finding indicated that when students felt confident engaging in major decision-making at time 1 they felt more satisfied with and capable in their classes, as well as they found their classes more beneficial.

In the 3 time point model each variable predicted itself at the consecutive time point with autonomous decision-making, academic satisfaction, subjective well-being, and future intention at time 1 also predicting themselves at time 3. However, in the 2 time point model none of the time 1 variables predicted themselves at time 2. A negative path emerged from competent decision-making at time 2 to subjective well-being at time 3. Students may have reported less happiness toward the end of the academic year after engaging in decision-making tasks near the beginning of the spring because maybe they were reconsidering their earlier decisions. Steele and McDonald (2000) proposed a number of reasons students may have for reconsidering their majors. Students may learn new information about their initial choice, be confronted with developmental or academic challenges, or feel pressure from families and society. Additionally, Steele and McDonald (2000) suggested that these students experience feelings of failure when transitioning between majors. Another negative path from academic efficacy at time 2 to value at time 3 suggested that when students felt more confident in their coursework at the beginning of the spring they valued their coursework less at the end of the spring semester. This finding is likely spurious as efficacy and value were positively related at each time point in the 2 time point model.

### **SUBJECTIVE WELL-BEING**

A number of paths emerged from subjective well-being in both models. Specifically in the 3 time point model, well-being at time 1 predicted competent decision-making at time 2 and 3, while well-being at time 2 predicted autonomous decision-making at time 3. In the 2 time point model, well-being at time 1 predicted competence need satisfaction, autonomous and

competent decision-making, and academic satisfaction at time 2. These findings suggest that for undecided/undeclared students psychological health may help students feel more competent in their advising sessions, confidently participate in decision-making activities which are self-endorsed, and feel more satisfied with their courses.

## **IMPLICATIONS**

Overall, this research provides additional insight into advising practices and decision-making behaviors of college students to foster retention, timely degree completion, and career goal pursuit. The present findings may be beneficial to academic advising professionals. Specifically, advisors can be introduced to self-determination theory and need-supportive practices to the extent that they may benefit adaptive student outcomes. Autonomy-supportive practices advisors could find beneficial in their advising sessions include providing relevant choices and rationales, as well as using non-controlling language. Advisors could also state clear expectations and propose informative feedback to their students to enhance feelings of competence. Additionally, to support feelings of relatedness, advisors can demonstrate interest and warmth toward their advisees. Advisors can focus on approaches which satisfy students' needs for competence by providing timely, clear, and appropriate feedback regarding students' abilities to actively engage in the major exploration process. Specifically, advisors can encourage students to seek information regarding areas of interest and follow up with students about recent activities. It is important that exploring students feel they are going in the right direction. Also, advisors can help students identify resources which may help strengthen students' psychological health. First-year students may experience a number of issues while transitioning to college. Advisors can be aware of campus and community resources which could be beneficial for these students. For example, students may need psychological counseling, emergency financial assistance, day cares, and housing options, to name a few.

## **LIMITATIONS AND FUTURE DIRECTIONS**

The current study has several limitations. Notably, the time between assessment time points, while crucial during students' exploration process, produced attrition through the course of the study. This diminished response rate reduced the power needed to find significant results using the multilevel modeling that was initially proposed for this study. Students were asked to include their advisors initials in order to potentially nest the students by advisor. Students reported 83 unique advisor initial sets, with a range of 1 to 23 for the number of students per advisor. The researcher attempted to retain participants through timely reminders about the study as the next time point approached. One study has suggested that incentives in the form of gift cards have had a positive effect on online survey response in longitudinal studies in the past (Laguilles, Williams, & Saunders, 2011). While students who participated in the 2012-2013 academic year were incentivized by being entered into a drawing to win 1 of 10 \$20 online gift cards, during the 2013-2014 academic year students were incentivized monetarily to participate at each time point in increasing increments. However, it appeared the students were greatly compelled to participate at time point 1 during the 2013-2014 year in order to receive an extra credit point in their classes. Of the 599 students completed the survey at time point 1 in fall 2013, 158 (26.38%) did not collect the monetary incentive but wanted to receive their extra credit point. Additionally, attrition in the study may have been due to attrition in the university. One student informed the researcher that she had left the university. Given what we know about undecided students it is not uncommon for these students to either transfer to another institution or drop out of college after one semester. Future researchers collaborate with instructors across semesters in order to provide the students with course incentives for participation in longitudinal studies on college students. Additionally, future study designs could explore the role of academic advising on matriculation and degree completion.

Another potential limitation in the present study was the use of an online survey through email. Sheehan (2001) concluded that response rates to email surveys has declined and will continue due to multiple factors. Specifically, there has been an increase in the amount of

unsolicited email or “spam” sent to internet users since the inception of electronic email. University students are no exception. Students may have viewed subsequent emails from the researcher as spam and ignore them. Future studies may benefit from using hard copy surveys. This may prove beneficial if monetary incentives are provided, as well. Specifically, participants would be able to collect their incentive when they hand in the survey. In the present study, several students did not collect the incentive at each time point during the 2013-2014 year (157 at time 1, 33 at time 2, and 11 at time 1).

The present study included students who were undecided and undeclared. A critical distinction between these two categories is that undeclared students may have made a decision about their major but are unable to officially declare the major. At the university where the study was conducted students are admitted to the university into the college/department which they apply. Many colleges/departments have a maximum number of students they admit each year. If that number is reached, students who meet admission requirements are accepted to the university and placed into the School of Undergraduate Studies. This school also houses undecided/exploratory students. Future research could expand on the present findings by determining the level of indecision and categorizing students to determine the effects of need-supportive advising on each type of student.

Another set of limitations involves the advisor-student relationship. This study explored students’ perceptions of their advisors, not the actual advisors’ behaviors. Skinner and Belmont (1993) found a positive relation between students’ perceptions and teachers’ reports of need support overtime, as well as a positive association between students’ reports of engagement and teachers’ perceptions of student engagement throughout the school year. Further research could focus on advisors’ perceptions of their ability to meet their students’ basic psychology needs. Additionally, the advising sessions may not have incorporated any discussion of major decision-making. Students may have experienced problems with coursework, grades, adjusting to college, or finding other resources on campus. Throughout these types of discussions, advisors may have



been viewed as need-supportive; however, this support may not have translated directly to motivation for academic major decision-making. Lastly, the proposed study did not include any assessment regarding the nature of relationships with people other than the advisor, though family, peers and faculty are known to influence students' major decision-making (Beggs et al., 2008; Guay et al., 2003; Walmsley et al., 2010). Future research could examine a host of other influences known to impact academic decision-making.

## **CONCLUSION**

The present study investigated the benefits of perceived need support and need satisfaction on decision-making, as well as motivation-related outcomes. Specifically, it was hypothesized that undecided students who perceive their advising experiences as supportive and satisfying of feelings of autonomy, competence, and relatedness may experience enhanced motivation toward major decision-making, academic coursework, and career aspirations. Additionally, it was hypothesized that students may report increases in academic satisfaction and psychological well-being. These findings may be potentially relevant to several domains: self-determination theory, undecided student literature, as well as academic advising and retention research. Advising relationships may benefit, to the extent that advisors cultivate need-supportive practices to benefit students' personal and academic growth.

## Tables and Figures

**Table 1**

*Participation Details for Each Academic Year*

	2012-2013			2013-2014		
	Participated	Recruited	Undecided/ Undeclared	Participated	Recruited	Undecided/ Undeclared
Time 1	104	104		599	257	256
Time 2	27	27	13	124	257	123
Time 3	15	--	8	102 <sup>a</sup>	--	101

*Note.* The number of undecided/undeclared students at Time 1 in 2012-2013 is unknown because the initial survey did not include an item assessing this criteria.

<sup>a</sup>This total includes 15 participants who did participate at Time 2.

**Table 2***Means and Standard Deviations for Variables in Two Time Point Model*

Variables	Time 1	Time 2
Autonomous need support	5.11 (1.14)	5.17 (1.27)
Competence need support	5.26 (1.10)	5.26 (1.25)
Relatedness need support	4.91 (1.05)	4.94 (1.27)
Combined need support	5.10 (1.02)	5.13 (1.18)
Autonomous need satisfaction	4.88 (.74)	4.94 (.74)
Competence need satisfaction	4.70 (1.03)	4.89 (1.04)
Relatedness need satisfaction	5.04 (1.01)	5.08 (1.11)
Autonomous decision making	3.14 (3.39)	2.47 (3.37)
Competent decision making	3.61 (.69)	3.73 (.74)
Academic satisfaction	4.87 (1.24)	4.93 (1.24)
Academic efficacy	5.16 (1.24)	5.21 (1.15)
Value toward coursework	5.39 (.99)	5.28 (1.10)
Subjective well-being	-.19 (13.93)	.25 (13.81)
Future intention	5.44 (1.47)	5.59 (1.43)

*Note.* Scales range from 1 to 7, with higher scores indicating more agreement. Subjective well-being is standardized.

**Table 3***Correlations for Two Time Point Model Variables at Time Point 1*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Autonomous need support													
2. Competence need support	.871*												
3. Relatedness need support	.801*	.772*											
4. Combined need support	.938*	.954*	.909*										
5. Autonomous need satisfaction	.654*	.600*	.551*	.648*									
6. Competence need satisfaction	.765*	.806*	.694*	.811*	.568*								
7. Relatedness need satisfaction	.828*	.801*	.863*	.884*	.627*	.710*							
8. Autonomous decision making	.333*	.335*	.294*	.336*	.362*	.458*	.263*						
9. Competent decision making	.311*	.256*	.232*	.306*	.313*	.391*	.235*	.427*					
10. Academic satisfaction	.371*	.329*	.371*	.386*	.271*	.442*	.332*	.503*	.627*				
11. Academic efficacy	.394*	.363*	.352*	.395*	.333*	.440*	.345*	.393*	.581*	.809*			
12. Value toward coursework	.390*	.351*	.374*	.402*	.316*	.427*	.318*	.546*	.550*	.865*	.710*		
13. Subjective well-being	.309*	.279*	.279*	.305*	.226*	.425*	.302*	.485*	.607*	.661*	.610*	.509*	
14. Future intention	.082	-.032	-.049	-.016	.079	.010	-.042	.176*	.164	.183*	.197*	.220*	.105

Note. \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

**Table 4***Correlations for Two Time Point Model Variables at Time Point 2*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Autonomous need support													
2. Competence need support	.911*												
3. Relatedness need support	.852*	.855*											
4. Combined need support	.955*	.972*	.940*										
5. Autonomous need satisfaction	.608*	.554*	.529*	.585*									
6. Competence need satisfaction	.735*	.698*	.682*	.734*	.528*								
7. Relatedness need satisfaction	.867*	.866*	.897*	.915*	.586*	.682*							
8. Autonomous decision making	.198**	.188**	.191**	.200**	.337*	.366*	.185**						
9. Competent decision making	.223*	.226*	.204**	.228*	.184**	.437*	.155	.530*					
10. Academic satisfaction	.304*	.309*	.313*	.323*	.145	.399*	.262*	.408*	.679*				
11. Academic efficacy	.226*	.229*	.216*	.234*	.107	.279*	.198**	.339*	.581*	.774*			
12. Value toward coursework	.366*	.373*	.343*	.378*	.213*	.409*	.317*	.405*	.629*	.899*	.765*		
13. Subjective well-being	.260*	.256*	.200**	.250*	.164*	.438*	.175**	.551*	.676*	.699*	.558*	.605*	
14. Future intention	.118	.130	.093	.120	-.054	.149	.072	.182**	.209**	.184**	.141	.195**	.114

Note. \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

**Table 5***Correlations for Two Time Point Model Variables at Different Time Points*

	Time 1 and 2
Autonomous need support	.12
Competence need support	.12
Relatedness need support	.17**
Combined need support	.14
Autonomous need satisfaction	.12
Competence need satisfaction	.21*
Relatedness need satisfaction	.10
Autonomous decision making	.25*
Competent decision making	.43*
Academic satisfaction	.41*
Academic efficacy	.34*
Value toward coursework	.18**
Subjective well-being	.99*
Future intention	-.07

*Note.* \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

**Table 6**

*Standardized Coefficients and Standard Errors for Direct Paths and Correlations in Two Time Point Model*

	Standardized Coefficients	Standard Error
<b>From Need-Supportive Advising 1</b>		
to Autonomous need satisfaction 1	.64*	.05
to Competence need satisfaction 1	.82*	.05
to Relatedness need satisfaction 1	.89*	.04
to Autonomous decision making 1	-.04	.61
to Competent decision making 1	-.03	.13
to Academic satisfaction 1	.11	.19
to Academic efficacy 1	.10	.20
to Value toward coursework 1	.28	.15
to Subjective well-being 1	-.24	2.09
to Future intention 1	-.00	.32
to Need-supportive advising 2	.03	.10
to Autonomous need satisfaction 2	-.02	.06
to Competence need satisfaction 2	.01	.09
to Relatedness need satisfaction 2	-.05	.08
to Autonomous decision making 2	.18	.56
to Competent decision making 2	.21	.11
to Academic satisfaction 2	.02	.17
to Academic efficacy 2	-.01	.19
to Value toward coursework 2	-.09	.17

**Table 6 continued**

to Subjective well-being 2	-.01	.34
to Future Intention 2	-.06	.28
<b>From Autonomous Need Satisfaction 1</b>		
to Autonomous decision making 1	.25**	.43
to Competent decision making 1	.12	.09
to Academic satisfaction 1	-.13	.13
to Academic efficacy 1	.04	.14
to Value toward coursework 1	-.05	.11
to Subjective well-being 1	-.11	1.49
to Future intention 1	.13	.22
to Need-supportive advising 2	.18 <sup>a</sup>	.03
to Autonomous need satisfaction 2	.05	.09
to Autonomous decision making 2	.06	.41
to Competent decision making 2	.01	.08
to Academic satisfaction 2	.05	.12
to Academic efficacy 2	-.03	.13
to Value toward coursework 2	-.01	.12
to Subjective well-being 2	.01	.24
to Future intention 2	.13	.21
with Competence need satisfaction 1	.11	.03
with Relatedness need satisfaction 1	.16	.02
<b>From Competence Need Satisfaction 1</b>		
to Autonomous decision making 1	.50*	.40



**Table 6 continued**

to Competent decision making 1	.48*	.09
to Academic satisfaction 1	.05	.13
to Academic efficacy 1	.07	.14
to Value toward coursework 1	-.04	.11
to Subjective well-being 1	.18	1.48
to Future intention 1	-.12	.22
to Competence need satisfaction 2	-.03	.10
to Autonomous decision making 2	-.33**	.40
to Competent decision making 2	-.22***	.08
to Academic satisfaction 2	-.10	.12
to Academic efficacy 2	-.03	.13
to Value toward coursework 2	-.05	.12
to Subjective well-being 2	-.02	.24
to Future intention 2	.09	.20
with Relatedness need satisfaction 1	-.02	.02

**From Relatedness Need Satisfaction 1**

to Autonomous decision making 1	-.19	.52
to Competent decision making 1	-.16	.11
to Academic satisfaction 1	.10	.16
to Academic efficacy 1	.07	.17
to Value toward coursework 1	-.05	.13
to Subjective well-being 1	.29***	1.77
to Future intention 1	-.11	.27

**Table 6 continued**

to Relatedness need satisfaction 2	.01	.08
to Autonomous decision making 2	-.05	.48
to Competent decision making 2	-.05	.10
to Academic satisfaction 2	-.09	.14
to Academic efficacy 2	-.05	.16
to Value toward coursework 2	.08	.14
to Subjective well-being 2	.02	.29
to Future intention 2	.06	.25

**From Autonomous Decision Making 1**

to Academic satisfaction 1	.25*	.03
to Academic efficacy 1	.06	.03
to Value toward coursework 1	.35*	.02
to Subjective well-being 1	.20**	.30
to Future intention 1	.10	.05
to Need-supportive advising 2	.18	.04
to Competence need satisfaction 2	.03	.02
to Autonomous decision making 2	.06	.09
to Academic satisfaction 2	.02	.03
to Academic efficacy 2	-.01	.03
to Value toward coursework 2	-.05	.03
to Subjective well-being 2	.00	.05
to Future intention 2	-.14	.04
with Competent decision making 1	.36*	.16

**Table 6 continued**

**From Competent Decision Making 1**

to Academic satisfaction 1	.47*	.13
to Academic efficacy 1	.50*	.13
to Value toward coursework 1	.34*	.10
to Subjective well-being 1	.51*	1.41
to Future intention 1	.19 <sup>b</sup>	.21
to Competence need satisfaction 2	.05	.11
to Autonomous decision making 2	-.04	.47
to Competent decision making 2	-.01	.09
to Academic satisfaction 2	.15	.13
to Academic efficacy 2	.20***	.15
to Value toward coursework 2	.24**	.12
to Subjective well-being 2	.02	.28
to Future intention 2	-.05	.21

**From Academic Satisfaction 1**

to Competence need satisfaction	.04	.11
to Autonomous decision making 2	.02	.33
to Academic satisfaction 2	-.05	.06
to Subjective well-being 2	-.01	.21
with Academic efficacy 1	.68*	.08
with Value toward coursework 1	.77*	.07
with Subjective well-being 1	.37*	.77
with Future intention 1	.11	.11

**Table 6 continued****From Academic Efficacy 1**

to Competence need satisfaction 2	-.05	.08
to Autonomous decision making 2	.02	.32
to Academic efficacy 2	.04	.07
to Subjective well-being 2	-.04 <sup>***</sup>	.20
with Value toward coursework 1	.55 <sup>*</sup>	.06
with Subjective well-being 1	.31 <sup>***</sup>	.79
with Future intention 1	.12	.12

**From Value Toward Coursework 1**

to Competence need satisfaction 2	.04	.11
to Value toward coursework 2	-.07	.06
with Subjective well-being 1	.15	.60
with Future intention 1	.15	.09

**From Subjective well-being 1**

to Need-supportive advising 2	.15	.01
to Competence need satisfaction 2	.23 <sup>***</sup>	.01
to Autonomous decision making 2	.53 <sup>*</sup>	.02
to Competent decision making 2	.61 <sup>*</sup>	.00
to Academic satisfaction 2	.26 <sup>*</sup>	.01
to Subjective well-being 2	.98 <sup>*</sup>	.02
with Future intention 1	-.01	1.21

**From Future Intention 1**

to Future intention 2	-.07	.08
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**Table 6 continued**

**From Need-Supportive Advising 2**

to Autonomous need satisfaction 2	.58*	.04
to Competence need satisfaction 2	.66*	.05
to Relatedness need satisfaction 2	.92*	.03
to Autonomous decision making 2	-.24	.51
to Competent decision making 2	.05	.10
to Academic satisfaction 2	.16	.15
to Academic efficacy 2	.09	.17
to Value toward coursework 2	.26	.15
to Subjective well-being 2	.03	.30
to Future intention 2	.31	.26

**From Autonomous Need Satisfaction 2**

to Autonomous decision making 2	.30*	.37
to Competent decision making 2	.04	.08
to Academic satisfaction 2	-.10	.12
to Academic efficacy 2	-.08	.13
to Value toward coursework 2	-.06	.12
to Subjective well-being 2	-.00	.23
to Future intention 2	-.29**	.20
with Competence need satisfaction 2	.19***	.03
with Relatedness need satisfaction 2	.16	.02

**From Competence Need Satisfaction 2**

to Autonomous decision making 2	.14	.34
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**Table 6 continued**

to Competent decision making 2	.27**	.07
to Academic satisfaction 2	-.08	.10
to Academic efficacy 2	-.14	.12
to Value toward coursework 2	-.08	.10
to Subjective well-being 2	.00	.21
to Future intention 2	.08	.18
with Relatedness need satisfaction 2	.12	.03

**From Relatedness Need Satisfaction 2**

to Autonomous decision making 2	.05	.52
to Competent decision making 2	-.20	.10
to Academic satisfaction 2	.11	.15
to Academic efficacy 2	.16	.17
to Value toward coursework 2	.07	.15
to Subjective well-being 2	-.02	.31
to Future intention 2	-.14	.26

**From Autonomous Decision Making 2**

to Academic satisfaction 2	.00	.03
to Academic efficacy 2	.04	.03
to Value toward coursework 2	.09	.02
to Subjective well-being 2	.03***	.05
to Future intention 2	.20***	.04
with Competent decision making 2	.24**	.12

**From Competent Decision Making 2**

**Table 6 continued**

to Academic satisfaction 2	.50*	.12
to Academic efficacy 2	.52*	.13
to Value toward coursework 2	.51*	.12
to Subjective well-being 2	.02	.25
to Future intention 2	.08	.21
<b>Academic Satisfaction 2</b>		
with Academic efficacy 2	.60*	.07
with Value toward coursework 2	.81*	.07
with Subjective well-being 2	-.14	.10
with Future intention 2	.06	.09
<b>Academic Efficacy 2</b>		
with Value toward coursework 2	.61*	.07
with Subjective well-being 2	-.03	.12
with Future Intention 2	.02	.10
<b>Value Toward Coursework 2</b>		
with Subjective well-being 2	-.10	.11
with Future intention 2	.05	.09
<b>Subjective Well-Being 2</b>		
with Future intention 2	-.07	.18

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*Note.* \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

<sup>a</sup>The alpha level for this path was .056. This path was not retained in the final model because the alpha reached non-significance ( $p = .118$ ).

<sup>b</sup>The alpha level for this path was .052. This path was retained in the final model.

**Table 7***Standardized Coefficients and Standard Errors for Indirect Effects for Two Time Point Model*

Indirect Pathway	Standardized Coefficient	Standard Error	95% CI
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Academic satisfaction 1	.02	.01	-.01,.04
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Academic satisfaction 1	.05***	.03	.01,.10
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Academic satisfaction 1	.18*	.05	.11,.25
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Academic efficacy 1	.20*	.06	.12,.29
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Value toward coursework 1	.03	.02	-.01,.07
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Value toward coursework 1	.09**	.03	.03,.16
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Value toward coursework 1	.13*	.03	.07,.19
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1	.02	.16	-.01,.04
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1	.05***	.34	.01,.10
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1	.18*	.55	.11,.25
Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1	.06	.83	-.06,.18



**Table 7 continued**

Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Future intention 1	.06 <sup>a</sup>	.05	-.01,.13
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Academic satisfaction 2	.003	.003	-.002,.01
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competent decision making 2 → Academic satisfaction 2	.01	.004	-.002,.01
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic satisfaction 2	.000	.000	.000,.001
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Academic satisfaction 2	.01	.01	-.00,.02
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competent decision making 2 → Academic satisfaction 2	.02 <sup>***</sup>	.01	.001,.03
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic satisfaction 2	.001	.001	.000,.003
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 2 → Academic satisfaction 2	-.03	.04	-.09,.03
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Academic satisfaction 2	.05 <sup>***</sup>	.02	.01,.09

**Table 7 continued**

Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1 → Academic satisfaction 2	.04**	.02	.01,.06
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1 → Competent decision making 2 → Academic satisfaction 2	.06**	.02	.02,.09
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic satisfaction 2	.01***	.003	.000,.01
Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1 → Competent decision making 2 → Academic satisfaction 2	.02	.02	-.02,.06
Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic satisfaction 2	.002	.002	-.002,.01
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competent decision making 2 → Academic efficacy 2	.01	.004	-.002,.01
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic efficacy 2	.000	.000	.000,.001
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 2 → Academic efficacy 2	-.03	.04	-.09,.03
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Academic efficacy 2	.07**	.03	.02,.11

**Table 7 continued**

Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competent decision making 2 → Academic efficacy 2	.02***	.01	.001,.03
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1 → Competent decision making 2 → Academic efficacy 2	.06*	.02	.03,.09
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic efficacy 2	.001	.001	.000,.003
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic efficacy 2	.01***	.002	.000,.01
Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1 → Competent decision making 2 → Academic efficacy 2	.02	.02	-.02,.06
Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic efficacy 2	.002	.002	-.002,.01
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competent decision making 2 → Value toward coursework 2	.01	.004	-.002,.01
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Value toward coursework 2	.000	.000	.000,.001

**Table 7 continued**

Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 2 → Value toward coursework 2	-.03	.04	-.09,.04
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Value toward coursework 2	.06**	.02	.02,.11
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competent decision making 2 → Value toward coursework 2	.02 <sup>b</sup>	.01	.000,.04
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Value toward coursework 2	.001	.001	-.001,.004
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1 → Competent decision making 2 → Value toward coursework 2	.06**	.02	.03,.10
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Value toward coursework 2	.01	.003	.000,.01
Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1 → Competent decision making 2 → Value toward coursework 2	.02	.03	-.02,.06
Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1 → Competence need satisfaction 2 → Competent decision making 2 → Academic efficacy 2	.002	.002	-.002,.01
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Subjective well-being 2	.02	.16	-.01,.04

**Table 7 continued**

Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 2 → Subjective well-being 2	-.01	.04	-.01,.001
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Subjective well-being 2	.05***	.34	.01,.10
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Academic efficacy 1 → Subjective well-being 2	-.01***	.05	-.02,-.001
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making 1 → Subjective well-being 1 → Subjective well-being 2	.18*	.54	.11,.25
Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1 → Autonomous decision making 2 → Subjective well-being 2	.00	.02	-.002,.004
Need-supportive advising 1 → Autonomous need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Autonomous decision making 2 → Future intention 2	.002	.002	-.001,.01
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 2 → Future intention 2	-.03	.02	-.06,.002
Need-supportive advising 1 → Competence need satisfaction 1 → Autonomous decision making 1 → Subjective well-being 1 → Autonomous decision making 2 → Future intention 2	.01	.01	-.002,.02
Need-supportive advising 1 → Competence need satisfaction 1 → Competent decision making → Subjective well-being 1 → Autonomous decision making 2 → Future intention 2	.02***	.02	.001,.04

**Table 7 continued**

Need-supportive advising 1 → Relatedness need satisfaction 1 → Subjective well-being 1 → Autonomous decision making 2 → Future intention 2	.01	.01	-.01,.02
Need-supportive advising 2 → Competence need satisfaction 2 → Competent decision making 2 → Academic satisfaction 2	.06**	.03	.01,.11
Need-supportive advising 2 → Competence need satisfaction 2 → Competent decision making 2 → Academic efficacy 2	.06***	.03	.01,.11
Need-supportive advising 2 → Competence need satisfaction 2 → Competent decision making 2 → Value toward coursework 2	.07***	.03	.01,.12
Need-supportive advising 2 → Autonomous need satisfaction 2 → Autonomous decision making 2 → Subjective well-being 2	.01***	.03	.000,.01
Need-supportive 2 → Autonomous need satisfaction 2 → Future intention 2	-.09 <sup>c</sup>	.06	-.18,.000
Need-supportive 2 → Autonomous need satisfaction 2 → Autonomous decision making 2 → Future intention 2	.03	.02	-.002,.07

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*Note.* \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

<sup>a</sup>The alpha level for this path was .055. This path was interpreted as significant.

<sup>b</sup>The alpha level for this path was .055. This path was interpreted as significant.

<sup>c</sup>The alpha level for this path was .051. This path was interpreted as significant.

**Table 8***Means and Standard Deviations for Variables in Three Time Point Model*

Variables	Time 1	Time 2	Time 3
Autonomous need support	5.17 (1.11)	5.07 (1.14)	5.16 (1.17)
Competence need support	5.20 (1.14)	5.21 (1.09)	5.23 (1.21)
Relatedness need support	4.87 (1.10)	4.80 (.97)	4.88 (1.11)
Combined need support	5.08 (1.05)	5.04 (1.01)	5.10 (1.11)
Autonomous need satisfaction	4.96 (.66)	4.88 (.76)	4.94 (.72)
Competence need satisfaction	4.78 (1.06)	4.79 (1.03)	4.77 (1.05)
Relatedness need satisfaction	5.04 (1.02)	4.98 (1.00)	5.02 (1.07)
Autonomous decision making	2.92 (3.51)	3.12 (3.43)	2.36 (3.64)
Competent decision making	3.58 (.77)	3.50 (.70)	3.69 (.75)
Academic satisfaction	4.79 (1.23)	4.73 (1.21)	4.74 (1.26)
Academic efficacy	5.17 (1.16)	5.04 (1.22)	5.11 (1.13)
Value toward coursework	5.29 (1.13)	5.33 (.98)	5.14 (1.12)
Subjective well-being	-.56 (14.23)	-.49 (13.98)	1.05 (14.72)
Future intention	5.53 (1.61)	5.62 (1.24)	5.75 (1.33)

*Note.* Future intention at time 1 N = 84, at time 2 N = 81, and at time 3 N = 87.

**Table 9***Correlations for Three Time Point Model Variables at Time Point 1*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Autonomous need support													
2. Competence need support	.905*												
3. Relatedness need support	.839*	.806*											
4. Combined need support	.958*	.964*	.921*										
5. Autonomous need satisfaction	.677*	.647*	.636*	.686*									
6. Competence need satisfaction	.795*	.821*	.712*	.823*	.614*								
7. Relatedness need satisfaction	.841*	.833*	.855*	.887*	.671*	.736*							
8. Autonomous decision making	.463*	.450*	.433*	.473*	.455*	.556*	.380*						
9. Competent decision making	.386*	.305*	.277*	.336*	.323*	.480*	.238**	.592*					
10. Academic satisfaction	.357*	.372*	.356*	.383*	.285*	.478*	.318*	.599*	.700*				
11. Academic efficacy	.393*	.408*	.372*	.415*	.324*	.459*	.361*	.400*	.636*	.793*			
12. Value toward coursework	.389*	.375*	.412*	.412*	.349*	.431*	.331*	.633*	.580*	.830*	.673*		
13. Subjective well-being	.338*	.326*	.272*	.272*	.320*	.466*	.331*	.504*	.541*	.654*	.571*	.473*	
14. Future intention	.112	.079	.103	.103	.114	.121	.094	.225**	.368*	.270**	.292*	.282*	.265**

Note. \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .



**Table 10***Correlations for Three Time Point Model Variables at Time Point 2*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Autonomous need support													
2. Competence need support	.880*												
3. Relatedness need support	.806*	.778*											
4. Combined need support	.943*	.956*	.913*										
5. Autonomous need satisfaction	.516*	.466*	.451*	.505*									
6. Competence need satisfaction	.673*	.707*	.702*	.742*	.465*								
7. Relatedness need satisfaction	.795*	.751*	.870*	.853*	.555*	.735*							
8. Autonomous decision making	.255**	.239**	.297**	.280**	.296*	.530*	.364*						
9. Competent decision making	.269*	.200	.317*	.272*	.229**	.506*	.314*	.634*					
10. Academic satisfaction	.326*	.233**	.338*	.310*	.178	.432*	.327*	.553*	.644*				
11. Academic efficacy	.202	.142	.189	.184	.095	.260**	.183	.367*	.466*	.744*			
12. Value toward coursework	.403*	.301*	.360*	.368*	.248**	.378*	.354*	.551*	.574*	.861*	.728*		
13. Subjective well-being	.256**	.165	.273*	.237**	.171	.487*	.299*	.634*	.677*	.762*	.496*	.624*	
14. Future intention	.176	.209	.230**	.221**	.058	.344*	.212	.067	.256**	.253**	.141	.245**	.164

Note. \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

**Table 11***Correlations for Three Time Point Model Variables at Time Point 3*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Autonomous need support													
2. Competence need support	.892*												
3. Relatedness need support	.849*	.844*											
4. Combined need support	.949*	.968*	.938*										
5. Autonomous need satisfaction	.642*	.570*	.590*	.623*									
6. Competence need satisfaction	.786*	.731*	.725*	.779*	.590*								
7. Relatedness need satisfaction	.878*	.869*	.885*	.919*	.645*	.718*							
8. Autonomous decision making	.261**	.237**	.226**	.251**	.344*	.441*	.210**						
9. Competent decision making	.345*	.307*	.299*	.329*	.126	.447*	.229**	.596*					
10. Academic satisfaction	.422*	.399*	.414*	.429*	.178	.426*	.327*	.393*	.550*				
11. Academic efficacy	.235**	.242**	.223**	.245**	.061	.167	.183	.272*	.556*	.745*			
12. Value toward coursework	.465*	.434*	.407*	.454*	.216**	.401*	.346*	.393*	.497*	.901*	.719*		
13. Subjective well-being	.389*	.357*	.320*	.370*	.232**	.547*	.256**	.624*	.669*	.699*	.519*	.622*	
14. Future intention	.156	.165	.123	.156	-.030	.211**	.122	.246**	.415*	.415*	.282*	.376*	.303*

Note. \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

**Table 12***Correlations for Three Time Point Model Variables at Different Time Points*

	Time 1 and 2	Time 1 and 3	Time 2 and 3
Autonomous need support	.23**	.48*	.37*
Competence need support	.21**	.41*	.31*
Relatedness need support	.14	.44*	.30*
Combined need support	.23**	.49*	.35*
Autonomous need satisfaction	.98*	.98*	.99*
Competence need satisfaction	.24**	.43*	.44*
Relatedness need satisfaction	.32*	.44*	.44*
Autonomous decision making	.30*	.10	.15
Competent decision making	-.01	-.07	.17
Academic satisfaction	.02	-.20	.15
Academic efficacy	-.14	-.18	.04
Value toward coursework	.03	-.10	.12
Subjective well-being	.001	.03	.09
Future intention	.06	-.08	.04

*Note.* \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

**Table 13**

*Standardized Coefficients and Standard Errors for Direct Paths and Correlations in Three Time Point Model 1*

	Standardized Coefficients	Standard Error
<b>From Need-Supportive Advising 1</b>		
to Autonomous need satisfaction 1	.71 <sup>*</sup>	.06
to Competence need satisfaction 1	.82 <sup>*</sup>	.06
to Relatedness need satisfaction 1	.88 <sup>*</sup>	.05
to Need-supportive advising 2	.64 <sup>*</sup>	.13
to Autonomous need satisfaction 2	.10	.09
to Competence need satisfaction 2	-.23 <sup>***</sup>	.12
to Relatedness need satisfaction 2	-.28 <sup>***</sup>	.13
to Need-supportive advising 3	.27 <sup>*</sup>	.09
to Autonomous need satisfaction 3	-.05	.08
to Competence need satisfaction 3	-.09	.12
to Relatedness need satisfaction 3	-.10	.09
<b>From Autonomous Need Satisfaction 1</b>		
to Need-supportive advising 2	-.31 <sup>***</sup>	.17
to Autonomous need satisfaction 2	.14	.10
to Autonomous need satisfaction 3	.12	.09
with Competence need satisfaction 1	.11	.03
with Relatedness need satisfaction 1	.18	.03
<b>From Competence Need Satisfaction 1</b>		
to Competence need satisfaction 2	.43 <sup>*</sup>	.11

**Table 13 continued**

to Competence need satisfaction 3	.20	.11
with Relatedness need satisfaction 1	.02	.03
<b>From Relatedness Need Satisfaction 1</b>		
to Relatedness need satisfaction 2	.41*	.13
to Relatedness need satisfaction 3	.03	.10
<b>From Need-Supportive Advising 2</b>		
to Autonomous need satisfaction 2	.45*	.06
to Competence need satisfaction 2	.71*	.07
to Relatedness need satisfaction 2	.77*	.07
to Need-supportive advising 3	.56*	.09
to Autonomous need satisfaction 3	-.19	.07
to Competence need satisfaction 3	-.13	.10
to Relatedness need satisfaction 3	-.42*	.08
<b>From Autonomous Need Satisfaction 2</b>		
to Autonomous need satisfaction 3	.35*	.09
with Competence need satisfaction 2	.06	.04
with Relatedness need satisfaction 2	.25***	.03
<b>From Competence Need Satisfaction 2</b>		
to Competence need satisfaction 3	.37*	.09
with Relatedness need satisfaction 2	.22***	.04
<b>From Relatedness Need Satisfaction 2</b>		
to Relatedness need satisfaction 3	.59*	.07
<b>From Need-Supportive Advising 3</b>		

**Table 13 continued**

to Autonomous need satisfaction 3	.63 <sup>*</sup>	.07
to Competence need satisfaction 3	.62 <sup>*</sup>	.08
to Relatedness need satisfaction 3	.84 <sup>*</sup>	.06
<b>Autonomous Need Satisfaction 3</b>		
with Competence need satisfaction 3	.01	.03
with Relatedness need satisfaction 3	.33 <sup>**</sup>	.02
<b>Competence Need Satisfaction 3</b>		
with Relatedness need satisfaction 3	.02	.03

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*Note.* <sup>\*</sup>  $p \leq .001$ , <sup>\*\*</sup>  $p \leq .01$ , <sup>\*\*\*</sup>  $p < .05$ .

**Table 14**

*Standardized Coefficients and Standard Errors for Direct Paths and Correlations in Three Time Point Model 2*

	Standardized Coefficients	Standard Error
<b>From Autonomous Need Satisfaction 1</b>		
to Autonomous decision making 1	.22	.52
to Competent decision making 1	.14	.11
to Autonomous need satisfaction 2	.09	.10
to Autonomous decision making 2	.24***	.51
to Competent decision making 2	.17	.10
to Autonomous need satisfaction 3	.03	.08
to Autonomous decision making 3	.15	.50
to Competent decision making 3	-.02	.09
with Competence need satisfaction 1	.63*	.10
with Relatedness need satisfaction 1	.68*	.10
<b>From Competence Need Satisfaction 1</b>		
to Autonomous decision making 1	.54*	.43
to Competent decision making 1	.63*	.09
to Autonomous need satisfaction 2	.17	.08
to Competence need satisfaction 2	.40*	.09
to Autonomous decision making 2	-.12	.46
to Competent decision making 2	-.23	.09
to Autonomous need satisfaction 3	.18 <sup>a</sup>	.06
to Competence need satisfaction 3	.17***	.07
to Autonomous decision making 3	-.13	.45

**Table 14 continued**

to Competent decision making 3	.03	.08
with Relatedness need satisfaction 1	.73*	.13
<b>From Relatedness Need Satisfaction 1</b>		
to Autonomous decision making 1	-.16	.47
to Competent decision making 1	-.31***	.10
to Autonomous need satisfaction 2	.20	.10
to Relatedness need satisfaction 2	.42*	.08
to Autonomous decision making 2	-.25	.50
to Competent decision making 2	-.04	.10
to Relatedness need satisfaction 3	.11	.08
to Autonomous decision making 3	-.06	.50
to Competent decision making 3	.03	.09
<b>From Autonomous Decision Making 1</b>		
to Competence need satisfaction 2	.17***	.03
to Autonomous decision making 2	.45*	.09
to Autonomous decision making 3	.24***	.10
with Competent decision making 1	.43*	.19
<b>From Competent Decision Making 1</b>		
to Competent decision making 2	.58*	.09
to Competent decision making 3	.13	.10
<b>From Autonomous Need Satisfaction 2</b>		
to Autonomous decision making 2	.05	.50
to Competent decision making 2	.01	.10



**Table 14 continued**

to Autonomous need satisfaction 3	.38*	.08
to Competence need satisfaction 3	.22*	.11
to Autonomous decision making 3	.16	.55
to Competent decision making 3	-.07	.10
with Competence need satisfaction 2	.38*	.07
with Relatedness need satisfaction 2	.49*	.07
<b>From Competence Need Satisfaction 2</b>		
to Autonomous decision making 2	.40*	.40
to Competent decision making 2	.45*	.08
to Competence need satisfaction 3	.50*	.07
to Autonomous decision making 3	-.09	.46
to Competent decision making 3	-.09	.08
with Relatedness need satisfaction 2	.67*	.11
<b>From Relatedness Need Satisfaction 2</b>		
to Autonomous decision making 2	.04	.42
to Competent decision making 2	-.10	.08
to Relatedness need satisfaction 3	.61*	.07
to Autonomous decision making 3	-.19	.50
to Competent decision making 3	-.08	.09
<b>From Autonomous Decision Making 2</b>		
to Autonomous need satisfaction 3	.19***	.02
to Autonomous decision making 3	.46*	.10
with Competent decision making 2	.44*	.15

**Table 14 continued**

**From Competent Decision Making 2**

to Competent decision making 3 .65\* .09

**From Autonomous Need Satisfaction 3**

to Autonomous decision making 3 -.03 .57

to Competent decision making 3 -.07 .10

with Competence need satisfaction 3 .33\*\* .05

with Relatedness need satisfaction 3 .61\* .06

**From Competence Need Satisfaction 3**

to Autonomous decision making 3 .35\*\* .45

to Competent decision making 3 .29\*\* .08

with Relatedness need satisfaction 3 .53\* .07

**From Relatedness Need Satisfaction 3**

to Autonomous decision making 3 -.07 .46

to Competent decision making 3 -.05 .08

**Autonomous Decision Making 3**

with Competent decision making 3 .36\*\* .12

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*Note.* \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .

<sup>a</sup>The alpha level for this path was .051. This path was retained in the final model.

**Table 15***Standardized Coefficients and Standard Errors for Direct Paths and Correlations in Three Time Point Model 3*

	Standardized Coefficients	Standard Error
<b>From Autonomous Decision Making 1</b>		
to Academic satisfaction 1	.31 <sup>*</sup>	.03
to Academic efficacy 1	.08	.04
to Value toward coursework 1	.42 <sup>*</sup>	.03
to Subjective well-being 1	.20 <sup>***</sup>	.40
to Future intention 1	-.07	.05
to Autonomous decision making 2	.47 <sup>*</sup>	.09
to Academic satisfaction 2	.06	.03
to Academic efficacy 2	-.04	.04
to Value toward coursework 2	-.16	.05
to Subjective well-being 2	-.03	.4
to Future intention 2	-.19	.07
to Autonomous decision making 3	.27 <sup>**</sup>	.09
to Academic satisfaction 3	.10	.03
to Academic efficacy 3	-.05	.03
to Value toward coursework 3	.05	.03
to Subjective well-being 3	.06	.32
to Future intention 3	-.07	.05
With Competent decision making 1	.59 <sup>*</sup>	.29
<b>From Competent Decision Making 1</b>		
to Academic satisfaction 1	.49 <sup>*</sup>	.16

**Table 15 continued**

to Academic efficacy 1	.54*	.18
to Value toward coursework 1	.36*	.13
to Subjective well-being 1	.51*	1.94
to Future intention 1	.50*	.22
to Autonomous decision making 2	.18*	.09
to Competent decision making 2	.51*	.10
to Academic satisfaction 2	-.00	.19
to Academic efficacy 2	-.07	.21
to Value toward coursework 2	.00	.27
to Subjective well-being 2	-.04	1.85
to Future intention 2	-.03	.40
to Competent decision making 3	.09	.09
to Academic satisfaction 3	-.14	.17
to Academic efficacy 3	.03	.20
to Value toward coursework 3	-.06	.18
to Subjective well-being 3	-.16	1.74
to Future intention 3	.24	.29

**From Academic Satisfaction 1**

to Academic satisfaction 2	.24*	.07
to Academic satisfaction 3	.19**	.07
with Academic efficacy 1	.68*	.10
with Value toward coursework 1	.68*	.08
with Subjective well-being 1	.36*	.98

**Table 15 continued**

with Future intention 1	-.08	.11
<b>From Academic Efficacy 1</b>		
to Academic efficacy 2	.42 <sup>*</sup>	.08
to Future intention 2	.28 <sup>***</sup>	.16
to Academic efficacy 3	.07	.08
with Value toward coursework 1	.51 <sup>*</sup>	.08
with Subjective well-being 1	.31 <sup>**</sup>	1.12
with Future intention 1	.01	.12
<b>From Value Toward Coursework 1</b>		
to Value toward coursework 2	.40 <sup>*</sup>	.13
to Value toward coursework 3	-.01	.08
with Subjective well-being 1	.07	.78
with Future intention 1	.04	.09
<b>From Subjective Well-Being 1</b>		
to Competent decision making 2	.25 <sup>**</sup>	.00
to Subjective well-being 2	.25 <sup>*</sup>	.07
to Competent decision making 3	.19 <sup>***</sup>	.00
to Subjective well-being 3	.27 <sup>*</sup>	.08
with Future intention 1	-.01	1.28
<b>From Future Intention 1</b>		
to Academic satisfaction 2	-.16 <sup>*</sup>	.05
to Value toward coursework 2	.08	.10
to Future intention 2	.26 <sup>***</sup>	.14

**Table 15 continued**

to Future intention 3	.21***	.11
<b>From Autonomous Decision Making 2</b>		
to Academic satisfaction 2	.08	.03
to Academic efficacy 2	.06***	.05
to Value toward coursework 2	.26	.05
to Subjective well-being 2	.26**	.34
to Future intention 2	-.01	.07
to Autonomous decision making 3	.34*	.10
to Academic satisfaction 3	.07	.03
to Academic efficacy 3	.09	.04
to Value toward coursework 3	-.01	.04
to Subjective well-being 3	.02	.34
to Future intention 3	.05	.05
With Competent decision making 2	.55*	.19
<b>From Competent Decision Making 2</b>		
to Academic satisfaction 2	.59*	.16
to Academic efficacy 2	.41*	.19
to Value toward coursework 2	.14	.24
to Subjective well-being 2	.52*	1.76
to Future intention 2	.16	.35
to Competent decision making 3	.62*	.08
to Academic satisfaction 3	-.05	.19
to Academic efficacy 3	-.09	.21

**Table 15 continued**

to Value toward coursework 3	.06	.20
to Subjective well-being 3	-.32**	2.03
to Future intention 3	-.18	.29
<b>From Academic Satisfaction 2</b>		
to Academic satisfaction 3	.48*	.07
with Academic efficacy 2	.57*	.08
with Value toward coursework 2	.68*	.10
with Subjective well-being 2	.42*	.67
with Future intention 2	.26***	.14
<b>From Academic Efficacy 2</b>		
to Academic efficacy 3	.47*	.08
to Value toward coursework 3	-.14***	.06
with Value toward coursework 2	.43*	.11
with Subjective well-being 2	.13	.72
with Future intention 2	-.07	.15
<b>From Value Toward Coursework 2</b>		
to Value toward coursework 3	.78*	.05
with Subjective well-being 2	.20**	.90
with Future intention 2	.33***	.28
<b>From Subjective Well-Being 2</b>		
to Autonomous decision making 3	.23***	.02
to Subjective well-being 3	.51*	.10
with Future intention 2	.04	1.32

**Table 15 continued**

**From Future Intention 2**

to Subjective well-being 3	.13 <sup>***</sup>	.48
to Future intention 3	.27 <sup>***</sup>	.09

**From Autonomous Decision Making 3**

to Academic satisfaction 3	-.14	.03
to Academic efficacy 3	-.10	.03
to Value toward coursework 3	.00	.03
to Subjective well-being 3	.18 <sup>***</sup>	.30
to Future intention 3	.02	.05
With Competent decision making 3	.35 <sup>**</sup>	.13

**From Competent Decision Making 3**

to Academic satisfaction 3	.43 <sup>*</sup>	.17
to Academic efficacy 3	.41 <sup>***</sup>	.18
to Value toward coursework 3	.24	.21
to Subjective well-being 3	.41 <sup>*</sup>	1.82
to Future intention 3	.28	.31

**Academic Satisfaction 3**

with Academic efficacy 3	.58 <sup>*</sup>	.07
with Value toward coursework 3	.74 <sup>*</sup>	.07
with Subjective well-being 3	.27 <sup>**</sup>	.54
with Future intention 3	.23 <sup>***</sup>	.08

**Academic Efficacy 3**

with Value toward coursework 3	.63 <sup>*</sup>	.07
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**Table 15 continued**

with Subjective well-being 3	.20	.60
with Future intention 3	-.06	.09
<b>Value Toward Coursework 3</b>		
with Subjective well-being 3	.07***	.83
with Future intention 3	.14	.09
<b>Subjective Well-being 3</b>		
with Future intention 3	.07	.83

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*Note.* \*  $p \leq .001$ , \*\*  $p \leq .01$ , \*\*\*  $p < .05$ .



Final structural model for Two Time Point Model with standardized coefficients (and standard errors). All paths significant at  $p \leq .001$ , except the paths from autonomous need satisfaction at time 1 to autonomous decision making at time 1, competence need satisfaction at time 1 to autonomous decision making at time 2, autonomous decision making at time 1 to subjective well-being at time 1, competent decision making at time 1 to value at time 2, subjective well-being at time 1 to competence need satisfaction at time 2, autonomous need satisfaction at time 2 to future intention at time 2, competence need satisfaction at time 2 to competent decision making at time 2, and autonomous decision making at time 2 with competent decision making at time 2 which are significant at  $p < .01$  and competence need satisfaction at time 1 to competent decision making at time 2, relatedness need satisfaction at time 1 to subjective well-being at time 1, competence decision making at time 1 to future intention at time 1, academic satisfaction at time 2, and academic efficacy at time 2, respectively, academic efficacy at time 1 to subjective well-being at time 2, autonomous need satisfaction with competence need satisfaction at time 2, and autonomous decision making to subjective well-being and future intention at time 2 which are significant at  $p < .05$ . SUPP = Need-supportive advising, AUTO SAT = Autonomous need satisfaction, COM SAT = Competence need satisfaction, REL SAT = Relatedness need satisfaction, AUTO DM = Autonomous decision making, COM DM = Competent decision making, ASAT = Academic satisfaction, AE = Academic efficacy, SWB = Subjective well-being, FI = Future intention.

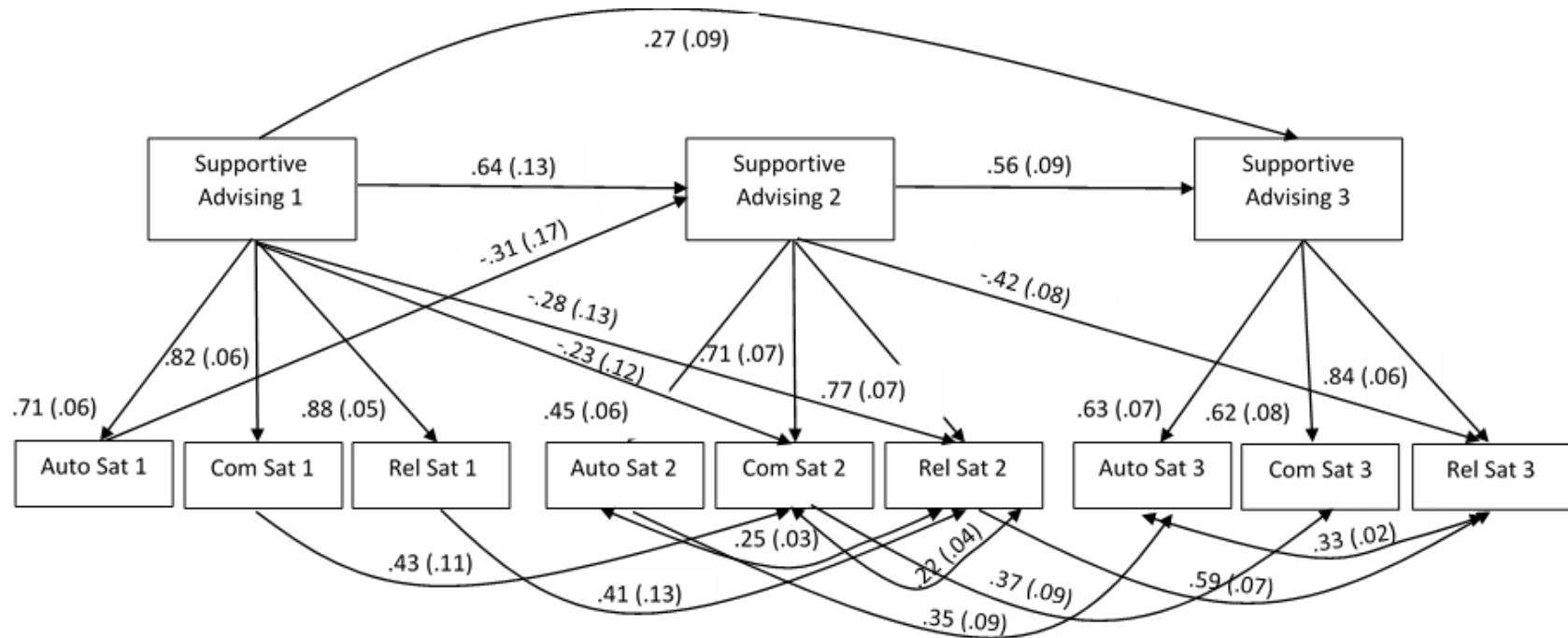


Figure 2. Final structural model for Three Time Point Model 1 with statistically significant standardized coefficients (and standard errors). All paths significant at  $p \leq .001$ , except autonomous need satisfaction at time 3 with relatedness need satisfaction at time 3 which is significant at  $p < .01$  and need-supportive advising at time 1 to competence and relatedness need satisfaction at time 2, respectively, autonomous need satisfaction at time 1 to need-supportive advising at time 2, and autonomous and competence need satisfaction at time 2, respectively, with relatedness need satisfaction at time 2 which are significant at  $p < .05$ . Auto Sat = Autonomous need satisfaction, Com Sat = Competence need satisfaction, Rel Sat = Relatedness need satisfaction.

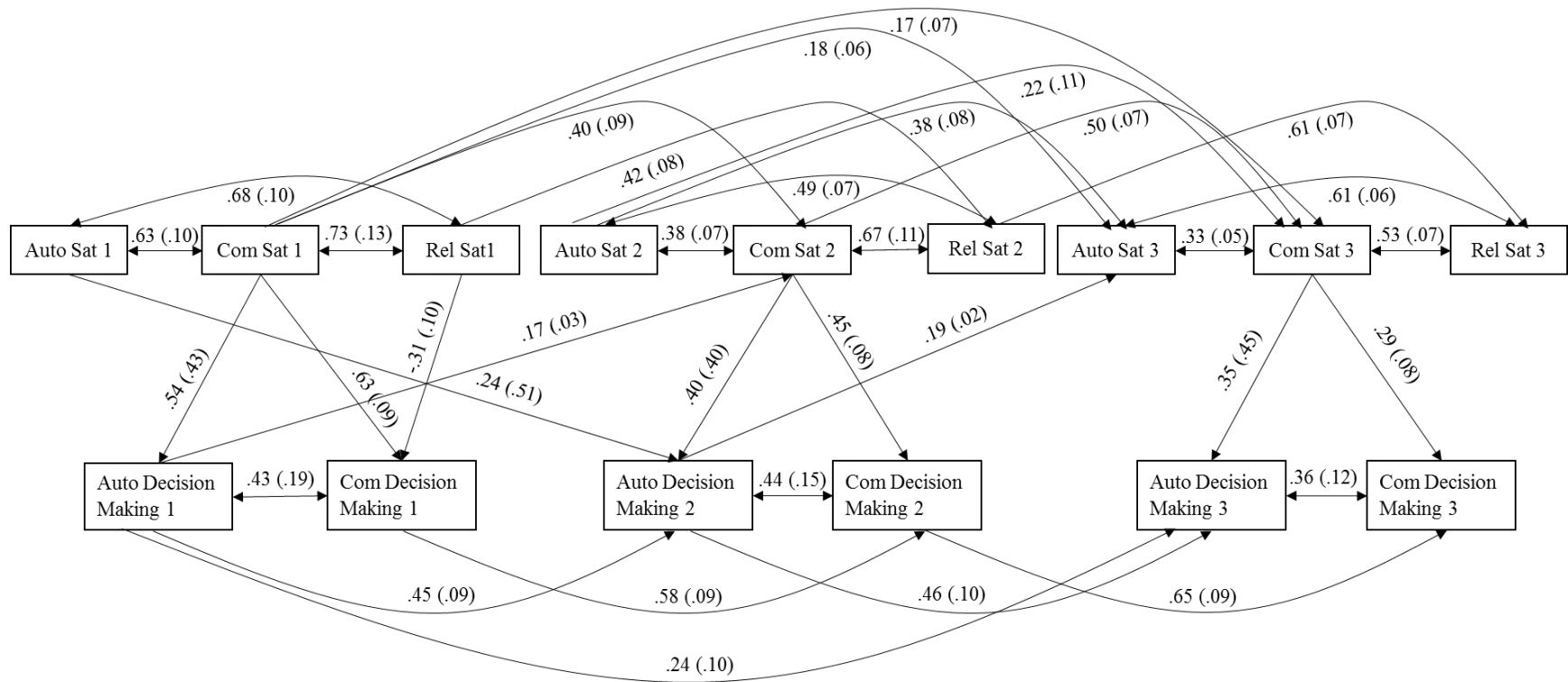


Figure 3. Full caption on next page.

Final structural model for Three Time Point Model 2 with standardized coefficients (and standard errors). All paths significant at  $p \leq .001$ , except the paths from autonomous need satisfaction at time 3 with competence need satisfaction at time 3, competence need satisfaction at time 3 to autonomous and competent decision making at time 3, respectively, and autonomous decision making at time 3 with competent decision making at time 3 which are significant at  $p \leq .01$  and autonomous need satisfaction at time 1 to autonomous decision making at time 2, competence need satisfaction at time 1 to itself at time 3, relatedness need satisfaction at time 1 to competent decision making at time 1, autonomous decision making at time 1 to itself at time 3 and competence need satisfaction at time 2, and autonomous decision making at time 2 to autonomous need satisfaction at time 3 which are significant at  $p < .05$ . The path from competence need satisfaction at time 1 to autonomous need satisfaction at time 3 is significant at  $p = .051$ . Auto Sat = Autonomous need satisfaction, Com Sat = Competence need satisfaction, Rel Sat = Relatedness need satisfaction, Auto Decision Making = Autonomous decision making, Com Decision Making = Competent decision making.

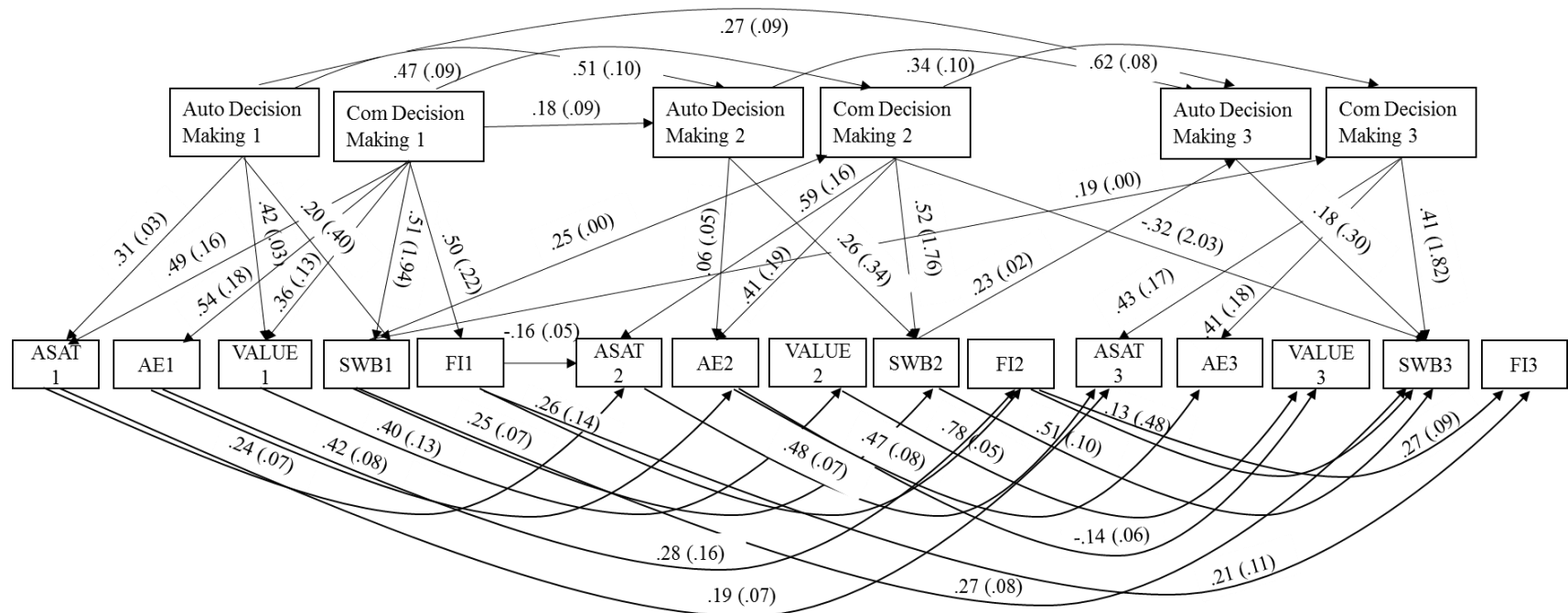


Figure 4. Full caption on next page.

Final structural model for Three Time Point Model 3 with standardized coefficients (and standard errors). All paths significant at  $p \leq .001$ , except the paths from autonomous decision making at time 1 to itself at time 3, academic satisfaction at time 1 to itself at time 3, subjective well-being at time 1 to competent decision making at time 2, and autonomous and competent decision making at time 2, respectively, to subjective well-being at time 2 which are significant at  $p < .01$  and autonomous decision making at time 1 to subjective well-being at time 1, subjective well-being at time 1 to competent decision making at times 2 and 3, respectively, future intention at time 1 to itself at times 2 and 3, autonomous decision making at time 2 to academic efficacy at time 2, academic efficacy at time 2 to value at time 3, subjective well-being at time 2 to autonomous decision making at time 3, future intention at time 2 to itself at time 2 and subjective well-being at time 3, autonomous decision making at time 3 to subjective well-being at time 3, and competent decision making at time 3 to academic efficacy at time 3 which are significant at  $p < .05$ . Correlations between the variables are available in Table 6. Auto Decision Making = Autonomous decision making, Com Decision Making = Competent decision making, ASAT = Academic satisfaction, AE = Academic efficacy, SWB = Subjective well-being, FI = Future intention.



## **Appendix A**

You are invited to participate in a set of surveys about academic advising and your experiences in college. The study is being conducted by Jennifer Kay Leach and Erika A. Patall of the Educational Psychology Department of The University of Texas at Austin, One University Station D5800, Austin, Texas 78712.

The purpose of this study is to examine the relationship between academic advising and students' major decision-making. Your participation in the survey will contribute to a better understanding of the role of academic advising in student's major decision-making. We estimate that it will take about 30 minutes of your time to complete the survey. You are free to contact the investigator at the above address to discuss the survey.

Additionally, this study will examine change overtime. Therefore, at the end of the survey you will be asked to include your email address so you can be contacted to complete two additional surveys (one at the beginning of the spring semester and one at the end of the spring semester). You will receive a \$5 Amazon.com gift card for your participation at each time point.

Risks to participants are considered minimal. EDP Subject Pool participants: Your EID will be used to record your participation in the study to fulfill your research requirement. We will not share your responses with your advisors or instructors/professors. Your results and UTEID will be shared with the Vice Provost's Student Success Initiatives team to gain your official UT Grade Point Average (GPA) and provide the team with information which will benefit academic advising practices

and retention efforts. Further, only the research team members will have access to the data during data collection.

Your participation in this survey is voluntary. You may decline to answer any question and you have the right to withdraw from participation at any time without penalty. If you wish to withdraw from the study or have any questions, contact the investigator listed above. Participants must be 18 years or older to participate in the study.

If you have any questions or would like us to change your email address, please send an email to [majordecision1213@gmail.com](mailto:majordecision1213@gmail.com). You may also request a hard copy of the survey from the contact information above.

This study has been processed by the Office of Research Support at The University of Texas at Austin. If you have questions about your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact - anonymously, if you wish - the Office of Research Support by phone at (512) 471-8871 or email at [orosc@uts.cc.utexas.edu](mailto:orosc@uts.cc.utexas.edu). You may reference this study by using Protocol Number: 2012-07-0085

If you agree to participate please click on the "I agree" button at the lower right of the screen. If you choose not to participate, please click on the "I do not agree" button to exit.

If you encounter any problems while completing the survey, please send an email to [majordecision1213@gmail.com](mailto:majordecision1213@gmail.com).

Thank you.

## Appendix B

Greeting UGS Student!

I am a doctoral student conducting research on academic advising and major decision-making for my dissertation project. I am interested in your perceptions of your advisor and these perceptions effect on how you choose an academic major. The survey will take about 30 minutes of your time to complete. None of your responses will be shared with your advisor. All of your responses will be kept confidential and participation is completely voluntary. You must be 18 years or older and a freshman to participate in this study.

Additionally, this study will examine change over time. Therefore, at the end of the survey you will be asked to include your email address so you can be contacted to complete two additional surveys (one at the beginning of the spring semester and one at the end of the spring semester). You will be entered to win 1 of 5 \$20 Amazon.com gift cards for taking the first survey! If you complete all 3 surveys you will be entered into a raffle to win 1 of 10 (or more) \$20 Amazon.com gift cards!

You must complete the survey by November 16th at 11:59 pm.

Please click the link below if you are ready to participate:

[https://utaustined.qualtrics.com/SE/?SID=SV\\_4OrCPsQbQvCJc9f](https://utaustined.qualtrics.com/SE/?SID=SV_4OrCPsQbQvCJc9f)

If you have any questions, please contact me at [majordecision1213@gmail.com](mailto:majordecision1213@gmail.com).

Thank you for your time and consideration.

Jennifer Kay Leach

Doctoral Student

Department of Educational Psychology

The University of Texas at Austin

Under the supervision of:

Erika A. Patall

Assistant Professor

Department of Educational Psychology

The University of Texas at Austin

## Appendix C

Hello!

I am a doctoral student conducting research on academic advising and major decision-making for my dissertation project. I am interested in your perceptions of your academic advisor and how these perceptions affect how you choose an academic major. None of your responses will be shared with your academic advisor. All of your responses will be kept confidential and participation is completely voluntary. You must be 18 years or older to participate in this study.

Additionally, this study will examine change over time. Therefore, at the end of the survey you will be asked to include your email address so you can be contacted to complete two additional surveys (one at the beginning of the spring semester and one at the end of the spring semester). You will receive \$5 at EACH time point for your participation.

For your convenience, there are 2 options for participation. Please only choose ONE.

Option 1: You can complete the survey by going to this link:

[https://utaustined.qualtrics.com/SE/?SID=SV\\_9ojw4FsGtXrS8Sh](https://utaustined.qualtrics.com/SE/?SID=SV_9ojw4FsGtXrS8Sh)

The survey will take about 30 minutes of your time to complete.

Note: The survey will be available online September 16th to October 20th.

In order to receive your \$5, you will need to collect your money in Sanchez 352 during one of the dates/times listed below:

October 21: 10 am - 1:30 pm

October 22: 10 am - 3 pm

October 24: 10 am - 3 pm

Option 2: You can complete the survey by coming to Sanchez 439 (Computer Lab B). The survey will take about 30 minutes of your time to complete. After you complete the survey, I will immediately give you \$5!

Please go to <http://www.wejoinin.com/sheets/desjg> to sign up for a 30-minute slot to come to the computer lab and take the survey.

If you have any questions, please contact me at [majordecision1213@gmail.com](mailto:majordecision1213@gmail.com).  
Thank you for your time and consideration.

Jennifer Kay Leach

Doctoral Candidate

Department of Educational Psychology

The University of Texas at Austin

Under the supervision of:

Erika A. Patall

Assistant Professor

Department of Educational Psychology

The University of Texas at Austin

## Appendix D

Approximately how many advising sessions have you had here at UT?

Have you ever declared a major in the past? If so, how many?

How many semesters/years have you been in college? How many more years/semesters until you graduate?

Have you chosen a major? If so, what major?

How likely are you to pursue a career directly related to your major?

Classification: freshman, sophomore, junior, senior, other

Age:

GPA:

Sex:

Race/Ethnicity: African American/Black, Hispanic/Latino/a, Asian/Pacific

Islander/Asian American, European American /White, Native American, Other

## **Appendix E**

### **LEARNING CLIMATE QUESTIONNAIRE**

(Williams & Deci, 1996)

1. I feel that my advisor provides me choices and options.
2. I feel understood by my advisor.
3. My advisor conveys confidence in my ability to do well in my degree plan.
4. My advisor encourages me to ask questions.
5. My advisor listens to how I would like to do things.
6. My advisor tries to understand how I see things before suggesting a new way to do things.



## **Appendix F**

### **SUPPORT FOR AUTONOMY**

(Zook & Herman, 2011)

1. My advisor is strict about doing everything his or her way. (R)
2. I am allowed to develop my own ideas in advising sessions.
3. My advisor encourages me to figure things out on my own, rather than telling me how to do it.
4. My advisor listens to my input.
5. My advisor allows me to make choices, such as which classes to take.
6. My advisor is very controlling. (R)

## Appendix G

### SUPPORT FOR COMPETENCE

(Zook & Herman, 2011)

1. My advisor provides helpful feedback.
2. My advisor cares about me really understanding degree plans and options.
3. My advisor explains degree plans and options clearly.
4. My advisor provides sufficient time to review degree plans and options.
5. My advisor organizes degree plans and options in a clear way.
6. My advisor does his or her job very well.
7. My advisor makes it easy to understand complicated academic policies and requirements.
8. My advisor insufficiently explains degree plans and options. (R)
9. My advisor is always willing to provide help.
10. My advisor is very confusing. (R)

## Appendix H

### ADVISOR INVOLVEMENT

(Belmont, Skinner, Wellborn, & Connell, 1991)

1. My advisor likes me.
2. My advisor really cares about me.
3. My advisor knows me well.
4. My advisor just doesn't understand me. (R)
5. My advisor spends time with me.
6. My advisor talks with me.
7. I can't depend on my advisor for important things. (R)
8. I can't count on my advisor when I need him/her. (R)

## Appendix I

### BASIC PSYCHOLOGICAL NEEDS SATISFACTION QUESTIONNAIRE (MODIFIED)

(Ilardi, Leone, Kassar, Ryan, 1993)

1. I feel like I am free to decide for myself how to act and what to do in my advising sessions.
2. I really like my advisor.
3. I do not feel very competent in my advising sessions. (R)
4. My advisor tells me I am good at coursework and tasks.
5. I feel pressured in my advising sessions. (R)
6. I get along with my advisor.
7. I pretty much keep my thoughts to myself when I am in my advising sessions. (R)
8. I am free to express my ideas and opinions in my advising sessions.
9. I consider my advisor to be my friend.
10. I have been able to learn interesting new information and skills in my advising sessions.
11. When I am in my advising sessions, I have to do what I am told. (R)
12. Most days, I feel a sense of accomplishment from working on my degree plan.
13. My advisor takes my feelings into consideration.
14. In my advising sessions, I do not get much of a chance to show how capable I am. (R)
15. My advisor cares about me.
16. I am not close to my advisor. (R)
17. I feel like I can pretty much be myself in advising sessions.
18. My advisor does not seem to like me much. (R)

19. When I am working on degree planning, I often do not feel very capable. (R)
20. There is not much opportunity for me to decide for myself how to go about my degree plan. (R)
21. My advisor is pretty friendly toward me.

## Appendix J

### MAJOR DECISION-MAKING AUTONOMY SCALE

(Guay, 2005)

1. Seeking information on academic majors:
  - A. For the pleasure of doing it.
  - B. Because I believe that this activity is important.
  - C. Because I would feel guilty and anxious if I did not perform this activity.
  - D. Because somebody else wants me to do it or because I would get something from somebody if I did it--rewards, praise, approval from it.
2. Identifying options for an academic major:
  - A. For the pleasure of doing it.
  - B. Because I believe that this activity is important.
  - C. Because I would feel guilty and anxious if I did not perform this activity.
  - D. Because somebody else wants me to do it or because I would get something from somebody if I did it--rewards, praise, approval from it.
3. Working hard to attain a degree:
  - A. For the pleasure of doing it.
  - B. Because I believe that this activity is important.
  - C. Because I would feel guilty and anxious if I did not perform this activity.
  - D. Because somebody else wants me to do it or because I would get something from somebody if I did it--rewards, praise, approval from it.
4. Identifying academic major options in line with a career goal:
  - A. For the pleasure of doing it.

- B. Because I believe that this activity is important.
  - C. Because I would feel guilty and anxious if I did not perform this activity.
  - D. Because somebody else wants me to do it or because I would get something from somebody if I did it--rewards, praise, approval from it.
5. Identifying steps to follow to complete an academic major degree plan:
- A. For the pleasure of doing it.
  - B. Because I believe that this activity is important.
  - C. Because I would feel guilty and anxious if I did not perform this activity.
  - D. Because somebody else wants me to do it or because I would get something from somebody if I did it--rewards, praise, approval from it.
6. Identifying what I value the most in an academic major:
- A. For the pleasure of doing it.
  - B. Because I believe that this activity is important.
  - C. Because I would feel guilty and anxious if I did not perform this activity.
  - D. Because somebody else wants me to do it or because I would get something from somebody if I did it--rewards, praise, approval from it.
7. Identifying an academic major option that is congruent with my interests and personality:
- A. For the pleasure of doing it.
  - B. Because I believe that this activity is important.
  - C. Because I would feel guilty and anxious if I did not perform this activity.
  - D. Because somebody else wants me to do it or because I would get something from somebody if I did it--rewards, praise, approval from it.

## **Appendix K**

### **ACADEMIC SATISFACTION**

(Lent et al., 2005)

1. I am comfortable with the educational atmosphere in my classes.
2. For the most part, I am enjoying my coursework.
3. I am generally satisfied with my academic life.
4. I enjoy the level of intellectual stimulation in my classes.
5. I feel enthusiastic about the subject matter in my coursework.
6. I like how much I have been learning in my classes.



## **Appendix L**

### **ACADEMIC EFFICACY SUBSCALE**

(Midgley et al., 2000)

1. I'm certain I can master the skills taught in my courses.
2. I'm certain I can figure out how to do the most difficult coursework.
3. I can do almost all the work in a course if I don't give up.
4. Even if the work is hard, I can learn it.
5. I can do even the hardest work in my courses if I try.

## **Appendix M**

### **TASK VALUE**

(Wigfield et al., 1997).

1. In general, I find my courses very interesting.
2. What I learn in the courses is useful.
3. For me, doing well in my courses is very important.
4. I feel that putting in the effort in my courses is important.
5. I believe my courses will be beneficial to me.
6. I like doing the work required in my courses.

## Appendix N

### POSITIVE AND NEGATIVE AFFECT SCHEDULE SCALE

(Watson, Tellegen, & Clark, 1988)

Interested	Irritable
Distressed	Alert
Excited	Ashamed
Upset	Inspired
Strong	Nervous
Guilty	Determined
Scared	Attentive
Hostile	Jittery
Enthusiastic	Active
Proud	Afraid

## **Appendix O**

### **SATISFACTION WITH LIFE SCALE**

(Diener, Emmons, Larsen, & Griffin, 1985)

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

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