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INSTRUCTOR-STUDENT RAPPORT AS A PSYCHOLOGICAL NEED FOR STUDENTS

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INSTRUCTOR-STUDENT RAPPORT AS A PSYCHOLOGICAL NEED FOR STUDENTS

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Communication and Information
at the University of Kentucky

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ABSTRACT OF DISSERTATION

INSTRUCTOR-STUDENT RAPPORT AS A
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There is a need to explore ways to better motivate students in instruction, as student motivation is an issue confronting teachers at all levels of education. Instructor-student rapport (ISR), a multidimensional concept comprised of students' enjoyable interaction and personal connection with instructors, has potential to offer educators a tool for increasing these important student outcomes. Further, self-determination theory (SDT) may have utility for illustrating the psychological mechanisms through which instructors influence students by building rapport.

First, this study explored what behaviors instructors should employ to build ISR with students. Specifically, prosocial humor (related and unrelated) and confirmation (responding to questions, demonstrating interest, ad teaching style) were investigated as instructor rapport-building behaviors. Results showed that instructors' use of related humor, demonstration of interest, and teaching style were significant predictors of both dimensions of ISR; mixed results were found for both responding to questions and unrelated humor.

Second, this study considered whether ISR was a significant predictor of student outcomes: intrinsic motivation, perceived cognitive learning, and academic performance. While enjoyable interaction was a significant, positive predictor of all three outcomes, personal connection was not a significant, positive predictor of any student outcomes. In fact, personal connection was a significant, negative predictor of perceived cognitive learning.

Third, this study explored whether ISR served as a mediator between these rapport-building behaviors and student outcomes as posited by SDT. Enjoyable interaction was a significant mediator in a majority of the models. However, personal connection was not a positive mediator in any models and served as a negative mediator when predicting perceived cognitive learning. Theoretical implications for this study's findings, along with practical tips for instructors hoping to build ISR with students, are forwarded. In addition, future directions and limitations are discussed.

KEYWORDS: *Instructor-Student Rapport, Instructional Communication, Self-Determination Theory, Humor, Confirmation, Intrinsic Motivation*

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INSTRUCTOR-STUDENT RAPPORT AS A PSYCHOLOGICAL NEED FOR STUDENTS

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CHAPTER 1. INTRODUCTION

Over the course of K-12 education, there are marked declines in student academic motivation (Gnambs & Hanfstingl, 2016). This is problematic, given that motivational processes in instruction play a vital role in promoting student learning and achievement (Zimmerman, 2008). This problem is not unique to primary or secondary schools; colleges and universities are witnessing a decline in overall student motivation as well (Hidi & Harackiewicz, 2000; Lazowski & Hulleman, 2016). University classrooms are filled with students that consider learning "a chore rather than a joy" (Ryan & Deci, 2009, p. 171) and students who are "apathetic about learning and generally uninterested in the events that transpire in the classroom" (Goldman, Goodboy, & Weber, 2017, p. 168). Scholars at the Search Institute have prioritized this critical issue in their research. At the core of their findings is the idea that student relationships with their teachers play a key role in promoting both motivation and learning; however, there are pronounced gaps in the occurrence of these relationships from student perspectives (Roehlkepartain et al., 2017). Komarraju, Musulkin, and Bhattacharya (2010) similarly argued that "students' relationships with their faculty members are associated with important psychosocial and academic outcomes," and that "feeling alienated and distant from faculty members is associated with experiencing a lack of motivation" (p. 339).

Instructional communication researchers have likewise emphasized the benefits of relationships between instructors and students (Frymier & Houser, 2000; Nussbaum & Scott, 1980). Although these scholars do not argue that instructor-student relationships are a *necessary* condition for learning (i.e., learning can still occur in the absence of an instructor-student relationship), exploring the influence of these relational interactions is

necessary for promoting *optimal* (i.e., best possible conditions for) student learning, as these interactions have measurable influences on students attitudes and behaviors (Mottet, Frymier, & Beebe, 2006). One relational construct in instructional communication and educational research that has emerged as a significant variable of inquiry is instructor-student rapport (ISR; Frisby & Martin, 2010; Frisby & Myers, 2008). Studies considering ISR have provided evidence for its positive effects on student motivation and learning (for review, see Frisby & Buckner, 2018). Despite these measured influences, Frisby and Buckner (2018) emphasized that ISR is a relatively new area of research and that there is still much that is not known about ISR in the instructional process.

For example, specific strategies instructors can employ to build ISR are still under-researched. The most comprehensive investigation of instructor rapport-building behaviors comes from Webb and Barrett (2014). From their qualitative analysis of undergraduate student open-ended responses, they identified 514 behaviors that instructors can use to build rapport across five categories: attentive behaviors (e.g., prompt e-mail responses), common grounding behaviors (e.g., using examples relevant to students' age), courteous behaviors (e.g., being willing to listen), connecting behavior (e.g., incorporating jokes and humor), and information sharing behaviors (e.g., smiling and nodding during student presentation). In addition, Wilson, Ryan, and Pugh (2010) suggested several nonverbal behaviors instructors can use to develop ISR, some of the most notable being inviting body language and eye contact. Other researchers have offered tips for building ISR in their research. To build rapport, instructors can send welcome e-mails before class begins (Legg & Wilson, 2009), be generally supportive and

respectful (Kim & Thayne, 2015), or use student names in class (Meyers, 2009). While there is growing research that offers suggestions for instructors hoping to build ISR, more research could be conducted empirically explore how these behaviors contribute to student perceptions of ISR.

There are also significant opportunities for researchers to explore alternative theoretical explanations for ISR's influence in the instructional process. Frameworks such as the affective learning model (Frisby & Martin, 2010) and facework theory (Frisby, Berger, Burchett, Herovic, & Strawser, 2013) have been used to explain ISR's relationship with other instructional variables, but the study of ISR is still predominantly atheoretical (Frisby & Buckner, 2018). Both researchers and instructors would benefit from more theoretically-driven research to help unpack the nuances of this important classroom variable. Specifically, Deci and Ryan's (1985, 1991) self-determination theory (SDT) could help explain why ISR influences students in instruction. This theory emphasizes the underlying, psychological processes of individuals and places a focus on individuals' inherent need to feel related with those around them. When this need is satisfied, positive outcomes result (Deci & Ryan, 2012). Using this logic in the context of instruction, when students experience ISR and feel related to their instructors, positive outcomes should result. While there is some initial evidence that SDT has utility for understanding the role of ISR (Bolkan & Goodboy, 2015), no existing research provides an explicit test of this theory's explanatory power.

1.1 Research Questions and Specific Purposes

Given the need for research to continue exploring ways to promote positive student outcomes like motivation and learning, to understand what instructor behaviors

lead to perceptions of ISR, and to explore an alternative theoretical explanation for ISR's influence on student outcomes, this dissertation aims to address the following overarching research questions:

RQ1: What instructor behaviors help cultivate ISR?

RQ2: How can ISR help promote positive instructional outcomes for students?

RQ3: Is SDT a viable theoretical lens for understanding ISR's role in instruction?

Therefore, guided by SDT and these overarching research questions, the specific purposes of this dissertation are:

(a) to empirically explore what behaviors instructors should employ to build ISR with students;

(b) to provide evidence that ISR is important for motivating students, and ultimately, for promoting cognitive learning; and

(c) to test whether ISR serves as a mediator between instructor rapport-building behaviors and student outcomes as posited by SDT.

Chapter 2 provides an overview of relevant literature regarding ISR, SDT, rapport-building behaviors, and student outcomes resulting from ISR. Chapter 3 describes the methodology used to explore these overarching research questions and the study's hypotheses. Chapter 4 presents the results of the study, outlining the findings of both preliminary analyses and hypothesis testing. Chapter 5 presents a discussion of findings, elaborating on the theoretical and practical implications of the study's results; limitations and future directions are also discussed.

CHAPTER 2. REVIEW OF LITERATURE

To begin this review of literature, self-determination theory (SDT) will be proposed as an explanation for instructor-student rapport's (ISR) role in the instructional process. Then, an overview of ISR research in instructional communication and psychology will be provided. Framed by this theory, various behaviors instructors can employ to build ISR will be hypothesized. Student outcomes likely to result from ISR will also be forwarded. Finally, the mediational role of ISR, as situated by SDT, will be proposed in relation to instructor rapport-building behaviors and student outcomes.

2.1 Self-Determination Theory

For the purposes of this dissertation, SDT (Deci & Ryan, 1985, 1991) will be used to make sense of ISR's role in the instructional process for students. SDT is a valuable theoretical lens for framing ISR research for three primary reasons. First, in a variety of educational settings including the university classroom, SDT's explanatory power has robust empirical support (Deci & Ryan, 2002); SDT appears to be a particularly salient lens for understanding the instructional process. Second, SDT places emphasis on the role of social relatedness and connectedness as essential needs for students (Ryan & Powelson, 1991), concepts central to the study of instructor-student relationships and ISR. Third, SDT works to explain the psychological processes that lead to motivation (Ryan & Deci, 2017), a key student outcome in this study.

SDT is an organismic theory of human personality and motivation that uses individuals' inherent growth tendencies and innate psychological needs to explain the basis for self-motivation (Deci & Ryan, 1985, 1991). Deci and Ryan (2000) postulated

that “humans are active, growth-oriented organisms who are naturally inclined toward integration of their psychic elements into a unified sense of self and integration of themselves into larger social structures” (p. 229). Put simply, humans are wired to develop by internalizing, expanding, refining, and integrating aspects of their personality and motivation in an effort to self-improve. SDT works to explain the contexts and conditions that hinder or foster these processes.

SDT rests on the assumption that the fulfillment of three basic psychological needs supports individuals’ optimal functioning and natural tendencies for growth: competence, autonomy, and relatedness (Deci & Ryan, 1985). *Competence* involves understanding how to attain various external and internal outcomes and being efficacious in performing the required actions to reach such outcomes. Individuals feel competent when they encounter challenging scenarios that allow them to express their true capacities (Deci, Vallerand, Pelletier, & Ryan, 1991). *Autonomy* refers to the perceived source of one’s actions. Individuals feel autonomous when they internalize behaviors as an expression of their own free will (i.e., self-determined; Deci & Ryan, 1985). *Relatedness* involves developing satisfying social connections with others. This psychological need is met when individuals develop a sense of belonging with their peers, community members, or with others whom they respect (Ryan & La Guardia, 2000). Much like the need for relatedness, ISR describes the social connection between instructors and students, so exploring the role of this need could be useful for understanding how ISR may promote positive student outcomes, like motivation, in the classroom.

Key to SDT is the idea that motivation can vary in both quantity (i.e., how much) and quality (i.e., what type). Deci and Ryan (1985) distinguished between two types of motivation – extrinsic and intrinsic – based on the different motives that prompt action. Extrinsic motivation refers to doing an activity to "attain some separable outcome" (Ryan & Deci, 2000b, p. 60). Extrinsic motivation varies in the degree to which it is autonomous or controlled by external pressures and demands (i.e., locus of control; see Ryan & Deci, 2006). This variation is explained by the concept of internalization. Internalization describes how individuals transform external regulation by external factors into regulation by internal processes (Ryan & Connell, 1989). With increased internalization comes improved persistence and engagement, moving closer towards the second type of motivation proposed by SDT (Deci & Ryan, 2008). Intrinsic motivation is defined as doing an activity for "its inherent satisfactions rather than for some separable consequence" (Ryan & Deci, 2000b, p. 56). Intrinsic motivation is inherently autonomous and self-directed, enacted with a complete sense of volition (Deci & Ryan, 1975).

Social contexts that support an individual's three psychological needs help to maintain intrinsic motivation and promote higher levels of internalization (Ryan & Deci, 2000a). Inversely, contexts that thwart the fulfillment of basic needs minimize individuals' motivation, performance, and development (Ryan & Deci, 2000c). When contextualizing SDT to instruction, students' psychological needs for autonomy, competence, and relatedness function as "requisite nutriment for students' active engagement and positive school functioning" (Jang, Reeve, Ryan, & Kim, 2009, p. 649).

Students with fulfilled psychological needs are more likely to obtain positive instructional outcomes than those whose needs are left unfulfilled (Deci et al., 1991).

The satisfaction of students' psychological need for competence promotes positive instructional outcomes. Numerous studies link perceived competence to intrinsic motivation in a variety of educational contexts (Deci, Hodges, Pierson, & Tomassone, 1992; Grolnick, Ryan, & Deci, 1991). In and out of the classroom, positive feedback has been found to increase intrinsic motivation because it enhances perceptions of competence (Blanck, Reis, & Jackson, 1984). Inversely, negative feedback can lead to diminished competence, leaving individuals feeling helpless or amotivated (Boggiano & Barrett, 1985). Students' satisfied need for competence has been associated with emotional and academic adjustment (Duchesne, Ratelle, & Feng, 2014) along with general satisfaction with courses and instructors (Filak & Sheldon, 2003).

Likewise, the satisfaction of students' psychological need for autonomy promotes positive instructional outcomes. Copious studies have highlighted the fundamental role of autonomy support in promoting motivation (Katz, Kaplan, & Gueta, 2010; Ryan & Powelson, 1991), with students' satisfied need for autonomy being related to higher levels of intrinsic motivation (Orsini, Binnie, Wilson, & Villegas, 2017). Students' satisfied need for autonomy also promotes emotional and academic adjustment in school (Duchesne et al., 2014). Students' general satisfaction with their courses and instructors has been associated with perceptions of autonomy (Filak & Sheldon, 2003).

Paramount to the current study, the satisfaction of students' psychological need for relatedness promotes positive instructional outcomes. Satisfying students' psychological need for relatedness is important for promoting internalization and intrinsic

motivation (Anderson, Manoogian, & Reznick, 1976; Grolnick et al., 1991; Ryan & Powelson, 1991; Sparks, Dimmock, Lonsdale, & Jackson, 2016). Students' sense of relatedness is connected to their instructor and course evaluations (Filak & Sheldon, 2003) along with their emotional and academic adjustments in instructional contexts (Duchesne et al., 2014). Academic engagement and performance are also improved when this important psychological need is met (Furrer & Skinner, 2003). Taken together, it is clear that satisfying students' psychological needs is critical for promoting positive student outcomes in the classroom. In fact, some scholars argued that relatedness is the most salient need for supporting motivation in instruction (Trenshaw, Revelo, Earl, & Herman, 2016).

2.1.1 Self-Determination Theory in Instructional Communication

Over the past decade, instructional communication scholars have begun employing SDT as a sensitizing lens in research. Several early studies used SDT to help explain the effects of facework strategies in instructional feedback, arguing that facework helps foster students' self-determination and intrinsic motivation by addressing students' basic psychological needs (Kerssen-Griep, Trees, & Hess, 2008; Kerssen-Griep & Witt, 2012). Later, Bolkan (2015) used SDT to test whether affective learning and student engagement mediated the influence of intellectual stimulation, a concept Bolkan argued is related to autonomy, on students' intrinsic motivation. Stephens and Pantoja (2016) explored how intrinsic motivation, extrinsic motivation, and amotivation influence students' multicommunication behaviors. While not testing the theory directly, these studies provided initial evidence of SDT's explanatory power in communication and instruction.

Goodboy and colleagues have provided more direct tests of SDT over the past several years. Bolkan and Goodboy (2015) explored how instructor's humor orientation can generate positive classroom outcomes through the fulfillment of students' basic psychological needs. Because the authors believed no scale existed to effectively measure students' psychological needs in the university context, existing variables theoretically associated with these needs were used as proxies. For example, ISR was used to operationalize the need for relatedness. The authors found support that humor orientation's effects first promote affective learning (i.e., course, instructor, behaviors), subsequently helping to fulfil students' psychological needs, which in turn promotes cognitive learning (i.e., mediation).

Goldman et al. (2017) developed two measures to aid in testing SDT within the context of the university classroom: the Student Psychological Needs Scale and the Intrinsic Motivation to Learn Scale. Goldman created both operationalizations existed measures in SDT "require significant modifications before they can be applied to the context of the classroom" or "require their own modifications to meet the unique characteristics that define the contemporary college learning environment" (p. 171). For these reasons, Goldman's measure of intrinsic motivation was used in the current study. They found that in general, the fulfillment of students' psychological needs mediated the relationship between instructors' personalized education practices and students' intrinsic motivation to learn. Most recently, Baker and Goodboy (2018) found instructors' classroom misbehaviors can thwart the fulfillment of students' psychological needs. These findings offer support for the notion that instructors' classroom communication

and behavior is related to the fulfillment of students' psychological needs in the college classroom, and that these needs help predict student outcomes.

Overall, research highlights the value of considering students' psychological needs when seeking to promote positive student outcomes (Reeve, 2002). In particular, SDT research provides evidence to support the notion that relatedness, along with other needs, is important for optimal student functioning in the classroom. In instructional communication literature, researchers similarly argue for the importance of relatedness with regards to the instructor-student relationship (e.g., Frymier & Houser, 2000). One concept that has helped highlight the importance of instructor-student relationships is rapport (Frisby & Buckner, 2018).

2.2 Instructor-Student Rapport

The concept of rapport has been considered in a variety of contexts, including, but not limited to, business (e.g., Haner, 1965), counseling (e.g., Fischer, 1969), relationships (e.g., Carey, Hamilton, & Shanklin, 1986), health (e.g., Egbert, Battit, Welch, & Bartlett, 1964), and politics (e.g., Mennen Williams, 1964). While conversations surrounding rapport in educational contexts have taken place for a number of years (e.g., Medley, 1961), empirical investigations of the topic have gained traction only recently in both instructional communication (Frisby & Myers, 2008) and psychology (Wilson et al., 2010).

Motivated by research in customer service and marketing (Gremler & Gwinner, 2000), Frisby and Myers (2008) first introduced the concept of ISR to instructional communication research. In a follow-up study, Frisby and Martin (2010) defined rapport as "as an overall feeling between two people encompassing a mutual, trusting, and pro-

social bond" (p. 147). Rapport is a perceptual, not a behavioral, construct; not all students might perceive rapport with the same instructor because student reports of rapport vary based on their individual perceptions. Based on the conceptualization and operationalization by Gremler and Gwinner, rapport encompasses two dimensions: enjoyable interaction and personal connection.

Frisby and Myers (2008) explained that enjoyable interaction is "comprised of feelings of liking and positivity in the relationship" (p. 27). This dimension is reminiscent of constructs in instructional communication literature such as liking (Frymier, 1994) or affect towards an instructor (Anderson, 1979). Existing research has explored how instructor liking leads to positive student outcomes in instruction (e.g., ALM; Rodriguez, Plax, & Kearney, 1996). On the other hand, personal connection is "evidenced by strong affiliation, a bond, understanding, and mutual feelings within the relationship" (Frisby & Myers, 2008, p. 27). Similar concepts such as relational closeness (Mottet, 2000) have been explored in existing instructional communication research. While related, these dimensions are somewhat independent of one another. The extent to which a student enjoys interacting with their instructor (or likes their instructor in general) is not dependent on the perceived depth of the relationship with that instructor (Taylor, 1968). And, like with all relationships, feelings of personal connection with another person do not necessarily mean that you always enjoy interacting with them (Miller, 1990). What makes ISR unique from other relational concepts in instructional communication is the existence of both enjoyment and connection simultaneously, with both dimensions working in tandem to create an overall prosocial feeling of warmth and trust.

Meanwhile, in the field of psychology, Wilson et al. (2010) described the need to develop a scale for assessing professor-student rapport in the classroom. They defined rapport as "a relationship of mutual trust and liking" (Wilson et al., 2010, pp. 247–248). Because no existing measure seemed to fully capture the wide range of behaviors and perceptions associated with the construct, Wilson and colleagues developed a new measure to operationalize professor-student rapport from students' open-ended responses. Later, Wilson and Ryan (2013) introduced a modified, shortened version of the scale. These two scale development studies prompted subsequent research investigating professor-student rapport within psychology research.

Both lines of research have resulted in important knowledge claims related to ISR, the most relevant of which will be outlined in three categories: (a) instructor characteristics and behaviors; (b) student attitudes, emotions, and behaviors; and (c) student learning. Many classroom variables associated with ISR have also been related to the fulfillment of students' psychological need for relatedness; taken together, these findings begin to illustrate the connections between these two concepts.

First, ISR is related to instructor characteristics and behaviors. When students perceive ISR, they report higher levels of teacher effectiveness (Mintu-Wimsatt, Ingram, Milward, & Russ, 2006; Richmond, Berglund, Epelbaum, & Klein, 2015; Wilson & Ryan, 2013) and more positive attitudes toward their instructor (Wilson et al., 2010; Wilson & Ryan, 2013). ISR has been positively associated with student perceptions of instructor social support (Ryan, Wilson, & Pugh, 2011; Ryan & Wilson, 2014), general humor (Richmond et al., 2015), credibility (Frisby, Limperos, Record, Downs, & Kercsmar, 2013), and working alliance (Ryan & Wilson, 2014; Rogers, 2015), but

negatively associated with student perceptions of instructor verbal aggressiveness (Ryan et al., 2011; Ryan & Wilson, 2014). ISR has also been related to student perceptions of instructor face threat and face support (Frisby et al., 2014). Finally, student perceptions of ISR are associated with instructor nonverbal immediacy (Rodgers, 2015; Ryan & Wilson, 2014). While similar, nonverbal immediacy and rapport are conceptually and operationally distinct (Frisby & Housley Gaffney, 2015; Wilson et al., 2010). In SDT research, many of these instructor characteristics and behaviors, such as humor (Bolkan & Goodboy, 2015), have also been shown to contribute to the satisfaction of students' psychological need for relatedness.

Second, ISR is related to student behaviors, attitudes, and emotions. Participation (Frisby et al., 2014; Frisby & Martin, 2010; Frisby & Myers, 2008; Frisby, Slone, & Bengu, 2017) and various types of motivation (Estepp & Roberts, 2013; Frisby & Myers, 2008; Wilson & Ryan, 2013; Wilson et al., 2010; Ryan & Wilson, 2014) are the most commonly-considered student outcomes of ISR. Student behaviors including engagement (Richmond el al., 2015), classroom citizenship behaviors (Myers et al., 2016), out-of-class communication (Sidelinger, Frisby, & Heisler, 2016), attendance (Wilson & Ryan, 2013), and using campus services to seek help (e.g., tutoring; Sidelinger et al., 2016) have also been associated with perceptions of ISR. ISR works to increase students' positive attitudes and emotions like communication satisfaction (Ryan & Wilson, 2014), learner empowerment (Ryan & Wilson, 2014), and confidence (Strage, 2000), but decrease negative emotions like participation anxiety (Frisby et al., 2014). These associations are especially important given the exigency to better understand what promotes positive student outcomes, like motivation, as described in Chapter 1. Many of these outcomes,

particularly motivation (Osterman, 2000), are commonly associated with the fulfillment of students' psychological need for relatedness, providing further evidence of a connection between ISR and this psychological need.

Third, ISR is related to student learning. ISR has been related to various measures of cognitive learning: perceived cognitive learning (Frisby et al., 2017; Frisby & Housley Gaffney, 2015; Frisby & Martin, 2010; Rogers, 2015; Ryan & Wilson, 2014; Wilson & Ryan, 2013), anticipated final grades (Frisby & Housley Gaffney, 2015; Ryan & Wilson, 2014; Wilson & Ryan, 2013), actual final grades (Wilson & Ryan, 2013), quiz scores (Frisby et al., 2013), and grade point averages (Strage, 2000). Affective learning has also been related to student perceptions of ISR (Frisby et al., 2013, Frisby et al., 2017; Housley Gaffney, 2015; Frisby & Martin, 2010; Frisby & Myers, 2008). Scholars have long emphasized students' need to belong in the classroom as vital for promoting learning (Baumeister & Leary, 1995; LaPointe & Reisetter, 2008; Osterman, 2000), highlighting another parallel between ISR research and SDT.

2.2.1 Measuring Instructor-Student Rapport

Examining the measurement of ISR is important for understanding these findings and how they relate to SDT. Current research predominantly operationalizes ISR at a perceptual level (Frisby & Buckner, 2018). Instead of measuring particular instructor behaviors that build rapport, researchers measure students' general perceptions of the relationship between students and their instructors (e.g., Frisby & Myers, 2008). Three of the most prominent perceptual measures are overviewed herein.

Wilson et al. (2010) introduced a 34-item, unidimensional scale to measure professor-student rapport. Most items measure general perceptions and characteristics of

instructors (e.g., “My professor is thoughtful”), some items measure particular instructor behaviors thought to build professor-student rapport (e.g., “My professor maintains eye contact with me”), and several items measure the perceived quality of the interaction between the professor and students (e.g., “My professor and I get along”). Wilson and Ryan’s (2013) follow-up study reduced Wilson et al.’s original measure to six items; the authors recommended researchers employ the shortened version in future studies.

Both versions of the scale have psychometric shortcomings. The sample sizes for the exploratory factor analyses of both the full (n = 195) and reduced (n = 192) versions of the scale were small, limiting the potential stability of the factor patterns (DeVillis, 2017). Loose loading criteria for both analyses (i.e., a minimum loading of at least 0.5) and failure to consider potential cross-loadings onto other factors also lowered the future reproducibility of factor patterns from both studies. Importantly, both scales have yet to be structurally validated using confirmatory factor analysis procedures. These psychometric issues limit the utility of both versions in the present study.

The conceptual fit between Wilson et al.’s (2010) definition of professor-student rapport and their developed items is also troublesome. For example, items included in both versions ask students to report on the course itself, not the instructor-student relationship (e.g., “I really like to come to class”; “I dislike my professor’s class”). While it seems reasonable to assume that the instructor-student relationship could contribute to students’ feeling towards a particular class, these items measure a distant proxy of rapport that is at least somewhat dependent on other contextual factors (e.g., peer relationships, course content) and not solely on the actual relationship between the instructor and the student. Other items in the 34-item version ask students to report on instructor

characteristics which could not be theoretically connected to rapport (e.g., "My instructor is confident"). An instructor's confidence does not necessarily translate into feelings of trust or liking; overconfident or arrogant instructors could create relational distance from their students. Finally, none of the items retained in the 6-item version of the scale and few in the full 34-item version (e.g., "My professor and I get along") actually measure the mutuality of the professor-student relationship, a condition central to the authors' conceptualization of rapport.

Around the same time, Lammers and Gillaspy (2013) forwarded a 9-item, unidimensional measure to operationalize ISR. Eight of the items measure students' general perceptions of instructors (e.g., "Your instructor understands you") and one item asks students to report on their satisfaction of the relationship with their instructor (e.g., "In general, you are satisfied with your relationship with the instructor"). Lammers and Gillaspy's scale has a unique set of issues. In the initial scale development study, confirmatory factor analysis revealed a satisfactory factor structure - an improvement from Wilson et al.'s (2010) scale. However, since its development, the scale has been used in only a few studies (e.g., Lammers, Gillaspy, & Hancock, 2017), limiting the concurrent and construct validity of the measure. Similar to Wilson et al.'s scale, none of the items ask students to report on the mutuality of the instructor-student relationship; instead, students simply evaluate various characteristics that instructors might have that influence rapport (e.g., fair, caring, respectful). This conceptual and operational mismatch is a major concern when measuring a concept rooted in a mutual relationship.

In the first instructional communication study considering instructor-student rapport, Frisby and Myers (2008) adapted Gremler and Gwinner's (2000) 11-item scale

that examined employee-customer rapport to operationalize ISR in the classroom across two dimensions: enjoyable interaction (n = 6) and personal connection (n = 5). In a second study, Frisby and Martin (2010) further examined ISR using Gremler and Gwinner's (2000) adapted scale. Instead of analyzing the dimensions separately, Frisby and Martin considered the modified rapport measure (MRM) as unidimensional. Overall, there is growing evidence that Frisby and Myers' (2008) adapted measure is a valid and reliable scale (Frisby & Housley Gaffney, 2015). Unlike other measures, the MRM does include items that capture the mutuality of ISR (e.g., "I feel like there is a 'bond' between my instructor and me"). Given the psychometric and conceptual issues with the other aforementioned scales and the growing research providing validity evidence for the MRM, Frisby and Myers's adapted measure has the most utility for the present study.

There are clear connections between ISR and the need for relatedness. To begin, conceptualizations of the two concepts are similar. Deci and Ryan's (1985) definition of this psychological need highlights feelings of connectedness, while Frisby and Martin's (2010) conceptualization describes feelings of a pro-social bond. At the core of both definitions is a sense of affiliation between instructors and students. Indeed, scholars have argued that the need for relatedness is reflected in students' relationships with their instructors; the stronger the relationship between and instructor and student, the more the need for relatedness is fulfilled (Ryan, Stiller, & Lynch, 1994).

The two concepts are also operationalized similarly. In Goldman et al.'s (2017) recently developed Student Psychological Needs Scale, one dimension measures students' need for relatedness with their instructor. Some example items from this dimension include "My instructor does not care about me as a student" and "I can relate

to my instructor as a person." Frisby and Myers' (2008) MRM includes items like "My instructor has taken a personal interest in me" and "My instructor relates well to me." When compared, items from both scales have obvious similarities. Another predominant scale used to measure the satisfaction of psychological needs, Chen et al.'s (2015) Basic Psychological Need Satisfaction and Frustration Scale, uses words like "warm" and "close" in items to measure the satisfied need for relatedness, terms also included in items to describe the instructor-student relationship in Frisby and Myers' (2008) MRM.

Given these clear conceptual and operational similarities, for the current study, it will be assumed that variables that satisfy students' need for relatedness will also affect their perceptions of ISR. Similarly, it will be assumed that student outcomes which the satisfaction of students' need for relatedness affects will be similarly influenced by ISR. Using ISR as a statistical proxy for the satisfied need of relatedness will allow rapport to be situated and grounded in the propositions and logic of SDT (i.e., as a mediator between instructor behaviors and student outcomes), informing the hypotheses and research questions proposed herein.

2.3 Instructor Rapport-Building Behaviors

Rather than solely measuring perceptions of ISR, Frisby and Buckner (2018) highlighted the need for improved measurement of instructor rapport-building behaviors. As noted, a review of instructional communication and education literature reveals that operationalizations of ISR appear to be almost exclusively high-inference (i.e., general perceptions of rapport) rather than lower-inference (i.e., specific behaviors that indicate rapport). Solely measuring ISR using high-inference measures presents challenges for both researchers and instructors.

Theoretically, operationalizing ISR in this manner makes the construct nebulous, leaving a great deal up to interpretation (for similar discussion, see Bolkan, 2017). While still important for understanding ISR's role in the instructional process, high-inference measures do little to inform researchers of anything beyond general perceptions (Titsworth, Mazer, Goodboy, Bolkan, & Myers, 2015). Exploring low-inference behaviors would allow researchers to understand how various instructor rapport-building behaviors work independently to influence student outcomes. Pedagogically, high-inference measures make it challenging for researchers to provide specific behaviors instructors can enact to build more ISR in the classroom. If building ISR is indeed desirable for promoting positive classroom experiences for students, having empirically-supported instructor rapport-building behaviors is essential for training and educating instructors.

Many of the instructor rapport-building behaviors suggested by ISR researchers are well-researched topics in instructional communication research. Instructor humor, suggested by numerous scholars as a means for building ISR (Bolkan & Goodboy, 2015; Webb & Barrett, 2014), is a well-researched concept in both instructional communication and education (for review, see Banas, Dunbar, Rodriguez, & Liu, 2011). Being attentive to student needs, listening to student questions, and demonstrating interest in student learning, all behaviors Webb and Barrett (2014) found worked to cultivate a sense of ISR, are captured in Ellis' (2000) conceptualization and operationalization of teacher confirmation, a concept with robust empirical support within instructional communication (Goodboy & Myers, 2008). So, while there is no single scale to measure

instructor rapport-building behaviors, particular behaviors seem to be captured in existing measures.

While developing a new scale to measure instructor-rapport building behaviors would be beneficial, doing so could be problematic within the larger scope of instructional communication research. Although a new scale would allow researchers to test what specific behaviors contribute to student perceptions of ISR, there would likely be conceptual overlap among existing constructs (Nussbaum & Freidrich, 2005). Researchers in instructional communication have a tendency to "create and then justify their own constructs as separate and distinct from extant variables" when the differences are inconsequential (Waldeck, Kearney, & Plax, 2001, p. 225). This pattern impedes theoretical advances and minimizes the heuristic potential of research (Waldeck et al., 2001). In this case, developing a single measure of instructor rapport-building behaviors would likely result in an expansive, patchwork operationalization of items from existing scales (i.e, humor, confirmation). Instead, using existing scales to explore specific instructor behaviors that contribute to rapport would better situate ISR within instructional communication literature and avoid unnecessary conceptual overlap. Thus, for the purposes of the present study, existing instructor behaviors that are theoretically linked to ISR and are most commonly suggested as behaviors that should lead to ISR, specifically instructor humor and confirmation, will be explored as instructor rapport-building behaviors.

2.3.1 Instructor Humor

Humor is conceptualized as the communication of multiple, incongruous meanings that are amusing (Gervais & Wilson, 2005; Martin, 2007). More specifically, S.

Booth-Butterfield and M. Booth-Butterfield (1991) defined humor as "intentional verbal and nonverbal messages, which elicit laughter, chuckling, and other forms of spontaneous behavior taken to meant pleasure, delight, and/or surprise in the targeted receiver" (p. 91). Some examples of humor include jokes, riddles, puns, silly comments, or funny stories (Bryant, Comisky, & Zillmann, 1979). Humor can serve a variety of pro-social functions in instruction, such as creating amusement, bringing people together, or acting as a coping mechanism, but it can also serve anti-social functions, such as creating isolation or disparaging others (Banas et al., 2011). Instructor humor has been related to a host of instructional variables, including more favorable teacher evaluations (e.g., Wanzer & Frymier, 1999), higher perceptions of instructor credibility (e.g., Wrench & Punyanunt-Carter, 2005), and a more positive classroom climate (e.g., Wanzer, Frymier, & Irwin, 2010). Importantly, research links instructor humor to various types of student learning (Bolkan & Goodboy, 2015). This connection has been further explored through the explication and exploration of instructional humor processing theory (IHPT; Wanzer et al., 2010).

Wanzer, Frymier, Wojtaszczyk, and Smith (2006) sought to understand what types of instructor humor students perceive as appropriate and inappropriate. The results of their qualitative research revealed four categories of appropriate humor: related humor (i.e., connected to course material), unrelated humor (i.e., not connected to course material), self-disparaging humor (i.e., an instructor pokes fun at themself), and unintentional humor (i.e., unplanned but humorous). Four related categories of inappropriate humor were also found: offensive humor (i.e., nonspecific offensive humor), disparaging humor towards students (i.e., derogatory towards a student or

students), disparaging humor towards others (i.e., derogatory towards an individual or group other than students), and self-disparaging humor (i.e., derogatory towards themself). This study helps illustrate the numerous types of humor that instructors can employ when teaching. Soon after, Frymier, Wanzer, and Wojtaszczyk (2008) used this typology to develop a scale in order to better understand the functions of appropriate and innappropriate humor in the classroom. Factor analysis procedures collapsed the previous thematic categories into five overall dimensions: other disparaging humor, related humor, unrelated humor, offensive humor, and self-disparaging humor. Subsequent studies that have explored Frymier et al.'s operationalization provide evidence that instructors' use of both appropriate and inappropriate humor influences instructional outcomes (e.g., Wanzer et al., 2010).

Humor has the ability to enhance the quality of the instructor-student relationship (Bolkan & Goodboy, 2015; Provine, 2000; Welker, 1977). When used appropriately (i.e., related and unrelated), humor can have prosocial effects by promoting an enjoyable, cohesive classroom that facilitates liking and brings people together, similar to the enjoyable interaction dimension of ISR (Banas et al., 2011). And, many scholars argue that the prosocial nature of appropriate humor works to maintain and develop positive classroom relationships, much like the personal connection dimension of ISR (Claus, Booth-Butterfield, & Chory, 2012; DeVito, 1986; Walter, 1990). From an SDT perspective, Field, Sarver, and Shaw (2003) suggested that appropriate humor helps to "build and support the collaborative relationships that lead to greater self-determination" (p. 346). In their test of SDT, Bolkan and Goodboy (2015) provided additional evidence that instructor humor works to satisfy students' psychological needs, with the need for

relatedness having the strongest association with instructor humor orientation of the three psychological needs. Clearly, there is evidence to suggest that when instructors build a sense of cohesion and enjoyment through prosocial humor, students are likely to have a greater sense of relatedness. Correspondingly, as instructors use more related and unrelated humor in the classroom, ISR likely increases. To test this assumption, the following hypothesis is posed:

Hypothesis 1: Instructors' prosocial use of humor – (a) related and (b) unrelated – will be significant, positive predictors of student perceptions of ISR.

2.3.2 Teacher Confirmation

Teacher confirmation (Ellis, 2000, 2004) represents another teacher behavior that likely contributes to student perceptions of ISR. Teacher confirmation is defined as "the transactional process by which teachers communicate to students that they are endorsed, recognized, and acknowledged as valuable, significant individuals" (Ellis, 2000, p. 266). In her initial explication of the construct, Ellis (2000) contended that teacher confirmation should be operationalized along three dimensions. First, teachers can communicate confirmation by responding to student questions and comments. Second, teachers can communicate confirmation by demonstrating interest in student learning. Third, teachers can communicate confirmation through their teaching style. Initially, Ellis forwarded a fourth dimension, disconfirmation, but it was removed because of psychometric inconsistencies.

Ellis (2000) found strong correlations between teacher confirmation, perceived caring, nonverbal immediacy, and students' affective and cognitive learning. Later, Ellis (2004) provided more evidence for positive relationships between teacher confirmation

and student motivation and cognitive learning. However, these relationships were mediated by students' receiver apprehension, wherein teachers' confirming communication lowered students' apprehension - similar to ISR's effect on student apprehension (Frisby et al., 2014) - which in turn influenced classroom outcomes. Schrodt, Turman, and Soliz (2006) extended Ellis' initial line of research, arguing that teacher confirmation directly increased student perceptions of instructor understanding, a concept central to the personal connection dimension of ISR proposed by Frisby and Martin (2010).

Researchers' continued exploration of teacher confirmation further evidences the concept's likely connection with ISR. Results from a study by Goodboy and Myers (2008) indicated teacher confirmation leads to more student participation, a major outcome of ISR, along with other student behaviors like challenge behavior and communication motives. Another study revealed the relationships between teacher confirmation and classroom involvement, motivation, and learning - key outcomes considered in ISR and SDT research - are likely mediated by student perceptions of classroom connectedness (i.e., community among students; C. Edwards, A. Edwards, Torrens, & Beck, 2011). Teacher confirmation has also been related to increased student emotional interest, perceived emotional support, and positive emotional valence (Goldman & Goodboy, 2014), along with lower levels of student receiver apprehension (Hsu, 2012) and emotion work (Goldman & Goodboy, 2014). As previously noted, ISR likewise plays an important role in influencing students' attitudes and emotions.

All three dimensions of teacher confirmation should contribute to students' overall feelings of warmth, trust, and closeness with their instructor. First, how an

instructor responds to question may help shape students' perceptions of ISR, as evidenced by several items from this dimension of Ellis' (2000) scale. When an instructor "listens attentively when students ask questions or make comments during class" or "takes time to answer students' questions fully," students likely feel valued or trusted. If an instructor "indicates that he/she appreciates students' questions or comments," the pro-social bond between students and their instructor could be strengthened. Second, by demonstrating interest, instructors can help build ISR. If an instructor "makes an effort to get to know students" or shows interest in students nonverbally (e.g., "smiles at the class"; "establishes eye contact during lectures"), the instructor-student relationship is likely strengthened. Third, an instructor's teaching style may help create a stronger pro-social bond with students. If an instructor "uses an interactive teaching style that" that "uses a variety of teaching techniques to help students understand course material," students may feel understood and cared for, helping to deepen the personal connection between both the instructor and students. Taken together, the clear connections between items from each dimension of teacher confirmation and ISR evidence the potential association among both constructs. In fact, in their 2013 study, Young, Horan, and Frisby reported significant positive correlations between ISR and all three dimensions of teacher confirmation. As such, to replicate these findings, the following hypothesis is proposed:

> *Hypothesis 2: Instructors' confirming behaviors – (a) responding to questions, (b) demonstrating interest, and (c) teaching style – will be significant, positive predictors of student perceptions of ISR.*

2.4 Student Outcomes of Instructor-Student Rapport

Using the logic proposed by SDT, ISR has potential to influence student outcomes, such as cognitive learning and intrinsic motivation, as explained below.

2.4.1 Intrinsic Motivation

Student motivation is a traditional outcome explored as a result of instructor communication (Goldman et al., 2017; Goodboy & Myers, 2008) and a key component of SDT. Put simply, "to be motivated means to be moved to do something" (Ryan & Deci, 2000b, p. 54). In instructional communication research, motivation has been explored as both a trait- and a state-like variable. Trait motivation, relatively stable across courses, refers to the overall, general drive students have toward studying and learning (Richmond, 1990). State motivation refers to a student's efforts to acquire educational knowledge or skills in particular contexts at a particular time (Brophy, 1987; Katt & Condly, 2009). State motivation is more widely researched in instructional communication research, perhaps because of its greater capacity to be influenced and shaped by instructors.

Instead, Goldman et al. (2017) suggested that researchers should be concerned with the quality (i.e., what type), not just the quantity (i.e., how much), of student motivation in instruction. As such, exploring how students' intrinsic motivation relates to ISR, a motivational state more predictive of classroom outcomes than less self-directed forms of motivation (Fortier, Vallerand, & Guay, 1995), is vital for illustrating the scope of ISR's motivational influence in the classroom. Research in SDT emphasizes the centrality of instructor-student interactions in fostering an inner motivation to learn (Ryan & Powelson, 1991). A robust amount of existing research supports the connection

between the satisfied need for relatedness and students' intrinsic motivation in instructional contexts (Baker & Goodboy, 2018; Deci et al., 1991; Deci & Ryan, 2000; Ryan & La Guardia, 2000). As such, ISR should also be a significant, positive predictor of intrinsic motivation.

2.4.2 Cognitive Learning

Another important instructional outcome related to the fulfillment of students' need for relatedness is cognitive learning. Cognitive learning is a "variable of consequence" for instructional communication researchers and is a primary outcome in education research (King & Witt, 2009, p. 120). As a discipline, instructional researchers should focus on what communicative processes lead to cognitive learning, paying close attention to how the construct is operationalized (Clark, 2002; Lane, 2017). Cognitive learning has been defined as the acquisition, retention, and application of knowledge (Clark, 2002; Ellis, 2004; Frisby, Mansson, & Kaufmann, 2014; King & Witt, 2009). Instructional researchers have heavily relied on student perceptions to operationalize cognitive learning, using the learning loss measure (Richmond, McCroskey, Kearney, & Plax, 1987), the revised learning indicators scale (Frymier & Houser, 1999), and confidence testing (King & Witt, 2009). However, these operationalizations have been under constant scrutiny over the past several decades, with each measure having its own set of inadequacies (Frisby et al., 2014). To address common critiques leveled against these existing measures, Frisby and Martin (2010) developed the Cognitive Learning Measure to better align with the conceptualization of the construct, including items that measured acquisition, retention, and application. This conceptual match, along with

growing validity evidence for the measure, make Frisby and Martin's operationalization of perceived cognitive learning an appropriate fit for the current study.

The relationship between ISR and perceived cognitive learning is well-documented (Frisby et al., 2017; Frisby & Gaffney, 2015; Frisby & Martin, 2010; Rogers, 2015; Ryan & Wilson, 2014; Wilson & Ryan, 2013). Likewise, at the core of much SDT research in education is the connection between students' satisfied psychological needs, including the need for relatedness, and students' perceived learning (Deci et al., 1991; Guay, Ratelle, & Chanal, 2008; Niemiec & Ryan, 2009).

Solely relying on the perceived cognitive learning of students, however, is problematic, as students may have inaccurate perceptions of how much they have actually learned (King & Witt, 2009). Despite this, there are also issues associated with measuring cognitive learning by considering student exam, course, and assignment grades, which are other popular alternatives. Exam score may only capture one aspect of cognitive learning - recall - and ignore students' ability to acquire or apply knowledge (Frisby et al., 2014). Final course grades may be overly dependent on assignments that measure something besides cognitive learning, such as participation and attendance. A grade on a particular assignment may represent knowledge of a particular area, but it does not necessarily equate to increased learning in the class as a whole (McCroskey & Richmond, 1992). Despite these critiques, because grades are the nationally accepted educational measure of cognitive learning (King & Witt, 2009), understanding how they are affected by ISR is important.

ISR has been related to student assignment grades, exam grades, anticipated final course grades, and actual final course grades (Frisby et al., 2013; Frisby & Housley

Gaffney, 2015; Ryan & Wilson, 2014; Wilson & Ryan, 2013). Research shows that self-directed, motivated students with satisfied psychological needs have greater performance on course assignments (Black & Deci, 2000; Chen & Jang, 2010). Taken together, this review of literature provides strong evidence that ISR should be a significant, positive predictor of these student classroom outcomes:

> *Hypothesis 3: Student perceptions of ISR will be a significant, positive predictor of students' (a) intrinsic motivation, (b) perceived cognitive learning, and (c) academic performance.*

2.5 The Mediating Role of Instructor-Student Rapport

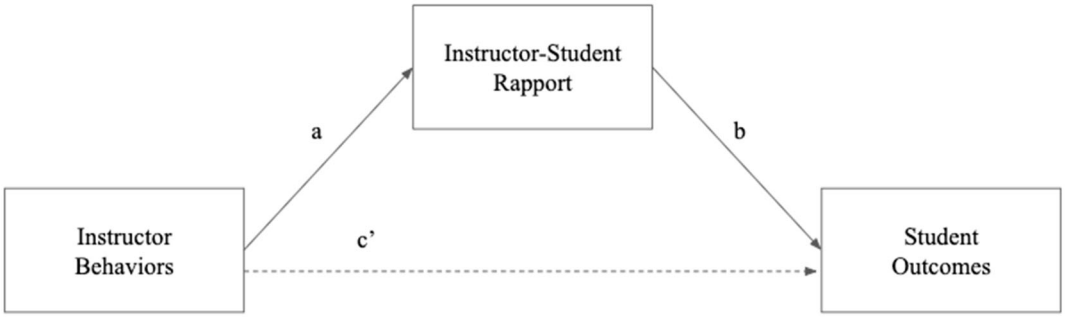
Using SDT as a synthesizing framework provides an empirically-supported, testable sequence that can help researchers better understand what leads to ISR (e.g., instructor behaviors) and what it affects (e.g., student outcomes). Theoretically, ISR should mediate the relationship between the aforementioned instructor behaviors (instructor humor and confirmation) and the proposed student outcomes (intrinsic motivation, perceived cognitive learning, and academic performance).

It is important to note that several of the proposed relationships outlined among instructor behaviors, ISR, and student outcomes have been previously explored in instructional research. However, replicating these results is imperative for the future of ISR research. Indeed, replication is a fundamental principle of research, enabling scholars to verify the accuracy of empirical findings, further validate the social significance of research, and help extend and validate theory. Without replication, ISR researchers run the risk of forwarding knowledge claims and generalizing findings built on an unsound, unreproducible foundation (Kaufmann & Tatum, 2017).

However, the most theoretically and empirically significant contribution of this dissertation lies in the proposed mediational role of rapport - a largely untested proposition - as explained below (see Figure 2.1). When situated in SDT, ISR (serving as a proxy for the satisfied need for relatedness) can serve as a mediating psychological need (Bolkan & Goodboy, 2015). Rather than instructors' rapport-building behaviors directly influencing student outcomes, these behaviors first influence ISR, and changes in ISR subsequently influence student outcomes. Several existing instructional studies have tested the mediational role of ISR. In their test of SDT, Bolkan and Goodboy (2015) found that ISR works, at some level, to mediate the relationship between instructor humor and student cognitive learning. Similarly, Frisby and Housely Gaffney (2015) found that the enjoyable interaction dimension of ISR mediated the relationship between instructor nonverbal immediacy and perceived cognitive learning but not anticipated final grades. Likewise, the personal connection dimension of ISR mediated the relationship between nonverbal instructor immediacy and both perceived cognitive learning and anticipated final grade.

It seems likely, though, that any instructor behaviors that build ISR would lead indirectly to student outcomes resulting from ISR, not just cognitive learning. For example, an instructor's use of humor could help build ISR, and greater perceptions of ISR could increase students' intrinsic motivation. Or, a confirming instructor could help students perceive a greater amount of ISR, and these positive changes in perceived ISR could increase students' intrinsic motivation. As both cognitive learning and intrinsic motivation are key outcomes in education SDT research (Deci & Ryan, 1985, 1991, 2012; Ryan & Deci, 2000a), finding evidence that ISR mediates the relationshipsFigure

2.1 Instructor-student rapport as a mediator between instructor behaviors and student outcomes



between instructor rapport-building behaviors and student outcomes would provide evidence of the theory's utility. To test these mediational assumptions and to explore SDT's utility for explaining ISR's role in the instructional process, the following hypotheses are posed:

Hypothesis 4: Student perceptions of ISR will positively mediate the relationship between instructors' prosocial use of humor (related and unrelated) and student outcomes – (a) intrinsic motivation, (b) perceived cognitive learning, and (c) academic performance.

Hypothesis 5: Student perceptions of ISR will positively mediate the relationship between instructors' confirming behaviors (responding to questions, demonstrating interest, and teaching style) and student outcomes – (a) intrinsic motivation, (b) perceived cognitive learning, and (c) academic performance.

2.6 Chapter Two Summary

In this chapter, literature on SDT, ISR, instructor rapport-building behaviors (instructor humor and confirmation), and student outcomes of ISR (intrinsic motivation, perceived cognitive learning, and academic performance) was reviewed. From this review, hypotheses were generated to explore the relationship between instructor behaviors that should lead to ISR and student outcomes that should result from it. Chapter 3 will describe the methodology used to test these proposed relationships.

CHAPTER 3. METHOD

Presented in this chapter are the details regarding the participants, research procedures, and survey instruments used for this dissertation.

3.1 Research Design

Following IRB approval, participants were recruited through a research participation system in undergraduate general education courses required by all students from a large Southern university. Recruitment began in week eleven and ended in week fourteen of the sixteen-week semester. This was done to allow students the opportunity to become familiar with their instructor and complete numerous course assignments but to avoid the stress of the last weeks of the semester. On the research participation system website, a description of the study was provided to students (see Appendix 1), including how much time they should expect for participation (20 minutes) and how many credits they would earn by completing the study (1 credit). Students in these general education courses are required to obtain three research credits through this system. Together, these credits make up about 3% of the student's final grade in the course. Students were eligible to complete the study if they were at least 18 years old and currently enrolled as a college student.

After electing to complete the survey through the website, participants were redirected to a questionnaire through a secure and unique link hosted by Qualtrics, an online survey system. Participants began by providing digital consent to participate in the study (see Appendix 2). Then, participants were asked to provide basic demographic information in order to document the diversity of the sample. Finally, participants were

asked to complete a series of instruments in reference to the face-to-face course they attended immediately prior to completing the survey (Plax, Kearney, McCroskey, & Richmond, 1986), allowing the sample to encompass a variety of courses and instructors and not just the course in which they were currently enrolled. This study's full survey can be found in Appendix 3.

3.2 Research Participants

An a priori power analysis was conducted and literature was consulted to determine the number of participants recommended for hypothesis testing. At their simplest, Hypothesis 1 - 3 would employ bivariate linear regression analyses, and an a priori power analysis recommended an approximate sample size of 55 given a medium effect size (0.15). When accounting for the possibility of control variables (up to 6) and multidimensional scales (up to 3 dimensions), an a priori power analysis recommended an approximate sample size of 78 for a hierarchical multiple regression given a medium effect size (0.15). For mediation analyses using bias-corrected bootstrapping in the later hypotheses, Fritz and MacKinnon (2007) recommended a sample size of at least 462 for mediation analyses with potentially small regression coefficients. DeVellis (2017) suggested a sample size of at least 300 when conducting confirmatory factor analysis. Taken together, a sample of size of at least 462 would be ideal.

Data cleaning procedures were used to reduce all participants who completed the survey ($N = 613$) to a final sample ($N = 477$). First, participants that did not complete at least 95% (66 of 69 items) of the survey were removed ($n = 17$). Second, participants whose completion time could have hypothetically interfered with the accuracy of their responses were removed ($n = 23$). To determine the expected completion time for the

survey, a pilot test was conducted with 68 participants (M = 12.26; SD = 4.10; Range = 8.58-26.67). The average completion time (12.26 minutes) was rounded up to 20 minutes (adding about 2 standard deviations) so that most participants (98% when consulting the normal curve) would finish quicker than the estimated completion time. Participants who completed the survey in 10 minutes, which is half of the expected completion time (i.e., participants would hypothetically not have had adequate time to fully read instructions, comprehend items, and provide meaningful answers), and those that completed the survey in over 3 hours (i.e., participants likely did not complete the survey in one sitting), were removed from the data. Third, multivariate outliers were identified and removed (n = 96) by calculating Mahalanobis distance and consulting chi-square critical values in an iterative process (Rousseeuw & Van Zomeren, 1990). This was done to prevent the most extreme outliers from masking other outliers (Tabachnick & Fidell, 2013). In the end, 477 participants were retained, exceeding the previously described ideal sample size.

Descriptive statistics were calculated to document the diversity of the retained sample. The majority of participants were male (n = 257, 53.9%), and the remaining participants identified as female (n = 217, 45.5%) or other (n = 3, 0.6%). Ages ranged from 18 to 55 (M = 19.75, SD = 2.80). In terms of student classification, participants identified as first year (n = 298, 62.5%), sophomore (n = 56, 11.7%), junior (n = 80, 16.8%), and senior (n = 43, 9.0%). Participants identified as white (n = 377, 79.0%), black or African American (n = 43, 9.0%), Asian (n = 30, 6.3%), Hispanic or Latino (n = 17, 3.6%), and other (n = 10, 2.1%). Participants reported 33 unique majors across the university.

3.3 Instrumentation

The following scales and items were used to collect responses from participants in order to test the proposed hypotheses. Items were presented to participants in the following order (see Appendix 3 for full survey). For each measure, descriptive statistics and reliabilities for the current study will be reported in Chapter 4 following confirmatory factor analysis procedures.

3.3.1 Instructor-Student Rapport

Perceptions of instructor-student rapport (ISR) were operationalized using a modified version of Gremler and Gwinner's (2000) rapport measure adapted for instructional research (MRM; Frisby & Myers, 2008). This 11-item instrument asks students to report on the extent to which they perceive enjoyable interaction (n = 6; e.g., My instructor relates well to me") and personal connection (n = 5; I have a close relationship with my instructor") with their instructor. Responses were measured using a 5-point, Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5).[1] Both dimensions have demonstrated adequate reliability in previous research (Frisby & Myers, 2008; Young et al., 2013): enjoyable interaction (Cronbach's α = .91-.93) and personal connection (Cronbach's α = .90-.93).

[1] Frisby and Myers' (2008) original study used a 7-point, Likert type scale when measuring ISR with the MRM. In the current study, a 5-point scale was used instead. Because the other measures included in the survey used 5-point scales, the author chose to use scaling different from Frisby and Myers to promote consistency across the survey. While not common, at least one previous study has employed the MRM using a 5-point scale (Myers et al., 2016). Fortunately, using only five response options on agree-disagree scales yields data of equal quality when compared to scales using additional response options (Revilla, Saris, & Krosnick, 2013). Past this, Dawes (2008) noted that 5-point and 7-point scales are comparable when conducting confirmatory factor analyses.

3.3.2 Prosocial Humor

Prosocial instructor humor was operationalized using two dimensions of Frymier et al.'s (2008) Teacher Humor Scale. Participants were asked to report on the frequency with which their instructor exhibits humorous behaviors in the classroom across two dimensions: related humor (n = 7; e.g., "Tells a humorous story related to course content") and unrelated humor (n = 3; e.g., "Tells jokes unrelated to course content"). Responses were measured using a 5-point, Likert-type scale ranging from *never* (1) to *very often* (5). Previous studies have reported reliability ranging from .85 to .86 (related humor) and .79 to .85 (unrelated humor) for each respective type (Frymier et al., 2008; Wanzer et al., 2010).

3.3.3 Confirmation

Instructor confirmation was operationalized using the Teacher Confirmation Scale (Ellis, 2000). This 16-item instrument asks participants to report on the frequency with which their instructor exhibits confirming behaviors in the classroom across three dimensions: responding to questions (n = 5; e.g., "indicated that she appreciated students' questions or comments"), demonstrating interest (n = 6; e.g., "made an effort to get to know students"), and teaching style (n = 5; e.g., "used an interactive teaching style"). Responses were measured using a 5-point, Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). Previous studies have reported reliability ranging from .80 to .86 (responding to questions), .83 to .87 (demonstrating interest), and .82 to .86 (teaching style) for each respective subscale (Ellis, 2004; Schrodt & Turman, 2006; Sidelinger & Booth-Butterfield, 2010).

3.3.4 Intrinsic Motivation

Intrinsic motivation was operationalized using Goldman et al.'s (2017) Intrinsic Motivation Scale. This 10-item instrument asks students to report on their level of intrinsic motivation in a course (e.g., "Learning new things in this class makes me feel like I am growing as a person"). Responses were measured using a 5-point, Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). Previous studies have reported reliabilities ranging from .93 to .94 for this scale (Baker & Goodboy, 2018; Goldman et al., 2017).

3.3.5 Perceived Cognitive Learning

Students' perceived cognitive learning was operationalized using Frisby and Martin's (2010) Cognitive Learning Measure. This instrument asks students to report on their acquisition (n = 6; e.g., "I have learned a great deal in this class"), retention (n = 2, e.g., "I can clearly recall information from this class"), and application (n = 2; e.g., "I have learned information that I can apply") of material in the course. Responses were measured using a 5-point, Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). While no apparent studies have reported reliability for each dimension separately, reliabilities have ranged from .83 to .88 for the unidimensional version of the scale (Frisby et al., 2014; Frisby & Martin, 2010).

3.3.6 Academic Performance

Academic performance on a major assignment was used as an additional means for operationalizing cognitive learning. First, after being provided basic how-to instructions for locating assignment grades in the university's learning management

system, students were asked to open a separate tab on their web browser and report the grade on their last major project or test as a percentage. Students were informed that this should not be a daily grade or an assignment graded for completion. Students in courses that do not utilize the university's learning management system were asked to report the grade for their last major project or test as a percentage by memory. The majority of students reported on a major project (n = 178, 37.3%), 178 students (37.3%) reported on a major exam, and 121 students (25.4%) reported on another type of major assignment (e.g., paper, presentation, lab report). Grades on the last major assignment ranged from 46% to 100% (M = 89.48, SD = 8.64).

3.3.7 Control Items

Various information was collected for the purpose of statistical control. Participants were asked to report on the gender of their instructor (male, female, or other). An instructor's gender may shape student perceptions of their teaching (McCartney, 2016). A majority of participants reported on male instructors (n = 271, 56.8%) and a minority reported on female instructors (n = 206, 43.2%).

Participants were asked to report on the size of the class they referenced (0-20, 21-40, 41-60, 61-80, 81-100, or 101+ students). A course's size may influence classroom relationships (Beattie & Thiele, 2016) as well as student motivation (Harfitt & Tsui, 2015). Of the participants, 140 reported on a class size of 0-20 students (29.4%), 188 on a class size of 21-40 students (39.4%), 47 on a class size of 41-60 students (9.9%), 28 on a class size of 61-80 students (5.9%), 21 on a class size of 81-100 students (4.4%), and 53 on a class size of 101 or more students (11.1%).

Participants were asked to report their midterm grade in the referenced course as a letter grade (A, B, C, D, or F). It seems logical that students' prior academic performance in the course could affect their view of the instructor, their perceptions of how much they have learned, and their subsequent motivation (Black & Deci, 2000). Of the participants, 258 received an 'A' at midterms (54.1%), 161 received a 'B' (33.8%), 43 received a 'C' (9.0%), 13 received a 'D' (2.7%), and 2 received an 'F' (0.4%).

Participants were asked to report on the perceived closeness of the relationship with their instructor prior to the start of the course using a single item ("Prior to the start of this course, how would you describe your relationship with your instructor?") using a 5-point scale ranging from *very distant* (1) to *very close* (5). Students' previous classroom relationship with an instructor has potential to inform their current perceptions (Howes, Phillipsen, & Peisner-Feinberg, 2000). Participants entered the classroom with perceived instructor relationships at both extremes of this scale (M = 2.22, SD = 1.10, Range = 1.00-5.00).

Participants were asked to report on the number of classes students had taken from this instructor prior to the start of the course. Students' previous classroom interactions with an instructor could similarly affect their current perceptions (Kenney, 2008). Students had taken anywhere from zero to four courses with their instructor prior to the current course (M = 0.23, SD = 0.51).

Participants were asked to report on the extent to which they typically desire a relationship with their instructors in courses using a single item ("To what extent do you typically desire a relationship with your instructors in courses?") on a 5-point scale ranging from *very undesired* (1) to *very desired* (5). Scholars have suggested that there

are individual differences in the intensity and strength of the need to belong (Baumeister & Leary, 1995). Participants in the sample reported desires at both extremes of the scale (M = 3.19; SD = 0.83; Range = 1.00-5.00).

3.4 Chapter 3 Summary

Presented in this chapter were the details regarding the participants, research procedures, and survey instruments for this study. These methodological choices will inform the subsequent results presented in Chapter 4.

CHAPTER 4. RESULTS

Presented in this chapter are the results of preliminary analyses and hypothesis testing.

4.1 Preliminary Analyses

A series of preliminary analyses were conducted to (a) explore instrument factor structures, (b) test parametric assumptions, and (c) identify covariates. These results guided subsequent hypothesis testing.

4.1.1 Confirmatory Factor Analyses

To begin, the researcher used confirmatory factor analysis (CFA) procedures to examine the factor structure of each scale in AMOS (Arbuckle, 2014). When previous researchers have reported multiple dimensions for the given scales, fit statistics for unidimensional (i.e., all items loading on a single latent variable) and multi-factor models (i.e., items split between multiple, correlated latent factors) were calculated and compared (Hinkin, 1998). For each scale, the solution with the best model fit was used for the purposes of hypothesis testing. Following guidelines by Byrne (2001) and Kline (2011), numerous fit indices were considered when assessing model fit, as each of the various indices have potential limitations.

First, models needed to demonstrate a chi-square ratio of approximately 2:1. While a widely-accepted norm in model fit reporting, chi-square is very sensitive to sample size (i.e., larger sample sizes result in larger chi-square values; Barrett, 2007). Because of the relatively large sample size for this study, chi-square tests that exceeded this ratio were anticipated and interpreted with caution as a basis for acceptance or

rejection of model fit (Schermelleh-Engel, Moosbrugger, Müller, 2003). Second, models needed to demonstrate a comparative fit index (CFI) and normed fit index (NFI) above 0.90. While the CFI is fairly sensitive to sample size, the revised NFI is less sensitive (Marsh, Hau, & Wen, 2004). These differences informed interpretation of both indices. Third, models needed to demonstrate a root mean square error of approximation (RMSEA) of less than 0.10. Researchers have argued that using a universal cutoff for RMSEA values is problematic because choices of cutoff values depend on sample size, model specification, and degrees of freedom (Chen, Curran, Bollen, Kirby, & Paxton, 2008). Additionally, RMSEA values are largely dependent on chi-square, so large sample sizes have potential to produce larger RMSEA values. Fourth, models needed to demonstrate a standardized root mean square residual (SRMR) of less than 0.80. Unlike chi-square, SRMR values become lower as sample size increases (Hooper, Coughlan, & Mullen, 2008). Thus, results from this model fit index will be interpreted in light of this study's relatively large sample size.

When models demonstrated poor fit based on these indices, modification indices (MIs) were consulted to explore potential for model fit improvement by correlating error terms. These correlations were added with caution; adding numerous and/or unwarranted error term correlations has potential to mask an alternate, potentially more meaningful, structure (Gerbing & Anderson, 1984; Thurber, Shinn, & Smolkowski, 2002). Error terms were correlated only if (a) items loaded on the same dimension and (b) there was sufficient theoretical justification for why variance, not otherwise explained by the theoretical construct, may covary across the two items (e.g., item wording was similar, both items were reverse-coded, or items were theoretically related; Gerbing & Anderson,

1984; Simon et al., 2010). Standardized estimates for item loadings were also considered. If items had a loading below 0.60, they were removed from the model iteratively (Ahmad, Zulkurnain, & Khairushalimi, 2016; Leung, Wong, Chan, & Lam, 2013). The researcher acknowledges correlating error terms and removing items in CFAs can been seen as problematic given the confirmatory purpose of such analyses; this limitation is acknowledged in Chapter 5.

4.1.1.1 Instructor-Student Rapport

While Frisby and Martin's (2008) modified instructor-student rapport (ISR) measure has two dimensions (i.e., enjoyable interaction and personal connection), most studies have used the scale unidimensionally. In this study, the unidimensional model fit the data poorly: x^2 (44) = 826.39, $p < 0.001$; NFI = 0.83; CFI = 0.84; RMSEA = 0.19 (90% CI = 0.18 to 0.21); SRMR = 0.07.

The two-factor model demonstrated improved model fit: x^2 (43) = 415.21, $p <$ 0.001; NFI = 0.92; CFI = 0.92; RMSEA = 0.14 (90% CI = 0.12 to 0.15); SRMR = 0.06. When consulting MIs, correlating the error terms for item 10 ("My instructor has taken a personal interest in me") and item 11 ("I have a close relationship with my instructor"), both on the personal connection dimension of the scale, offered the most potential for estimated parameter change (par change = 0.22). This correlation seems logical because an instructor taking personal interest in a student may be equated in a student's mind as a closer relationship. The modified two-factor model demonstrated improved model fit: x^2 (42) = 266.61, $p < 0.001$; NFI = 0.95; CFI = 0.95; RMSEA = 0.11 (90% CI = 0.09 to 0.12); SRMR = 0.04. Although chi-square and RMSEA did not meet the predetermined criteria, given the sensitivity of these indices to large sample sizes, model fit was deemed

acceptable for the modified two-factor model. Based on these results, the enjoyable interaction and personal connection dimensions were used separately in hypothesis testing. Both dimensions were reliable for the current sample: enjoyable interaction (Cronbach's α = 0.93; *M* = 4.00; *SD* = 0.80; Range = 1.00-5.00) and personal connection (Cronbach's α = 0.93; *M* = 3.44; *SD* = 0.96; Range = 1.00-5.00).

4.1.1.2 Prosocial Humor

Two dimensions of Frymier et al.'s (2008) Teacher Humor Scale were used to operationalize prosocial humor: related and unrelated humor. When loading onto a single factor, the unidimensional model fit the data poorly in this study: x^2 (35) = 958.16, $p <$ 0.001; NFI = 0.71; CFI = 0.71; RMSEA = 0.24 (90% CI = 0.22 to 0.25); SRMR = 0.14.

A two-factor model demonstrated improved model fit: x^2 (34) = 265.54, $p <$ 0.001; NFI = 0.92; CFI = 0.93; RMSEA = 0.12 (90% CI = 0.11 to 0.13); SRMR = 0.07. When examining standardized estimates for item loadings, item 6 ("My instructor facilitates student role-play exercises to illustrate course content") on the related humor dimension had a loading of 0.56 and was removed; a discussion of this item's removal can be found in Chapter 5. The omission of this item resulted in improved model fit: x^2 (26) = 137.59, $p < 0.001$; NFI = 0.95; CFI = 0.96; RMSEA = 0.05 (90% CI = 0.08 to 0.11); SRMR = 0.05. Although chi-square did not meet the predetermined criteria, given the sensitivity of this index to large sample sizes, model fit was deemed acceptable for the modified two-factor model. Based on these results, the related humor and unrelated humor dimensions were used separately in hypothesis testing. The related humor (Cronbach's α = 0.91; *M* = 3.35; *SD* = 0.88; Range = 1.00-5.00) and unrelated humor

dimensions demonstrated adequate reliability in the current study (Cronbach's α = 0.88; *M* = 2.50; *SD* = 0.99; Range = 1.00-5.00).

4.1.1.3 Confirmation

Although Ellis's (2000) Teacher Confirmation Scale has three dimensions (i.e., responding to questions, demonstrating interest, and teaching style), a majority of studies have employed the scale unidimensionally. In this study, the unidimensional model fit the data poorly: x^2 (90) = 1270.90, $p < 0.001$; NFI = 0.82; CFI = 0.83; RMSEA = 0.17 (90% CI = 0.16 to 0.17); SRMR = 0.07.

The three-factor model demonstrated improved model fit: x^2 (87) = 490.10, $p < 0.001$; NFI = 0.93; CFI = 0.94; RMSEA = 0.09 (90% CI = 0.09 to 0.10); SRMR = .04. Although chi-square did not meet the predetermined criteria, given the sensitivity of this index to large sample sizes, model fit was deemed acceptable for the three-factor model. Based on these results, each dimension was used separately in hypothesis testing. Each dimension - responding to questions (Cronbach's α = 0.94; *M* = 4.39; *SD* = 0.71; Range = 1.00-5.00), demonstrating interest (Cronbach's α = 0.92; *M* = 4.27; *SD* = 0.75; Range = 1.00-5.00), and teaching style (Cronbach's α = 0.92; *M* = 4.20; *SD* = 0.82; Range = 1.20-500) - was reliable for the current sample.

4.1.1.4 Intrinsic Motivation

In this study, the unidimensional model of Goldman et al.'s (2017) Intrinsic Motivation Scale demonstrated poor model fit: x^2 (35) = 394.65, $p < 0.001$; NFI = 0.92; CFI = 0.92; RMSEA = 0.15 (90% CI = 0.13 to 0.16); SRMR = 0.07. When consulting MIs, correlating the error terms for item 4 ("I find learning new things in this class to be unfulfilling") and item 8 ("I do not enjoy trying to comprehend new ideas in this class")

would improve model fit (parameter change = 0.95). Since these two error terms represent the only reverse-coded items in the scale, this modification is justifiable (Gerbing & Anderson, 1984). The modified unidimensional model demonstrated improved model fit: x^2 (34) = 238.40, $p < 0.001$; NFI = 0.95; CFI = 0.96; RMSEA = 0.11 (90% CI = 0.10 to 0.13); SRMR = 0.03. Although chi-square and RMSEA did not meet the predetermined criteria, given the sensitivity of these indices to large sample sizes, model fit was deemed acceptable for the modified two-factor model. This scale was reliable for the current sample (Cronbach's α = 0.86; *M* = 3.84; *SD* = 0.66; Range = 1.80-5.00).

4.1.1.5 Perceived Cognitive Learning

Although Frisby and Martin's (2010) Cognitive Learning Measure has three dimensions (i.e., acquisition, retention, application), most studies have used the scale unidimensionally. When loading onto a single factor, the unidimensional model fit the data poorly in this study: x^2 (35) = 1162.10, $p < 0.001$; NFI = 0.56; CFI = 0.57; RMSEA = 0.26 (90% CI = 0.25 to 0.27); SRMR = 0.18.

A three-factor model demonstrated improved model fit: x^2 (32) = 245.57, $p < 0.001$; NFI = 0.73; CFI = 0.75; RMSEA = 0.19 (90% CI = 0.25 to 0.28); SRMR = 0.12. When examining standardized estimates for item loadings, item 2 ("I have learned more in other classes than in this class") on the acquisition dimension had a loading of 0.09 and was removed; this is supported by Frisby, Mansson, and Kaufmann's (2014) omission of the same item in their study exploring the validity of the scale. A three-factor model with item 2 removed demonstrated both improved and worsened model fit when looking across indices: x^2 (34) = 226.55, $p < 0.001$; NFI = 0.75; CFI = 0.76; RMSEA = 0.22 (90%

CI = 0.28 to 0.31); SRMR = 0.13. MIs suggested correlating the error terms for item 4 ("I have learned nothing in this class") and item 6 ("I did not understand what I learned in this class") would improve model fit. Since these two error terms represent the only reverse-coded items in the acquisition dimension, this modification is justifiable (Gerbing & Anderson, 1984). The modified three-factor model with item 2 removed demonstrated improved model fit: x^2 (34) = 205.52, $p < .001$; NFI = 0.77; CFI = 0.79; RMSEA = 0.21 (90% CI = 0.26 to 0.29); SRMR = 0.12.

After consulting MIs and standardized item loadings, no additional alterations to the structural model met the predetermined criteria for justifiability. Overall, after making alterations to the model, the modified three-factor model still did not demonstrate evidence of model fit. However, because the modified three-factor model with item 2 removed demonstrated the best model fit, the acquisition, retention, and application dimensions will be used separately in hypothesis testing; implications for continuing to use a scale without evidence of an acceptable factor structure with the current data are discussed in Chapter 5.

The acquisition dimension was reliable in the current sample (Cronbach's α = 0.75; *M* = 4.04; *SD* = 0.72; Range = 2.00-5.00). The remaining two dimensions (i.e., retention and application) each only have two items. Because Cronbach's α underestimates the reliability of two item scales, scholars have suggested the Spearman-Brown prophecy formula (SB formula) is the most appropriate substitution when estimating reliability of two-item scales (Eisinga, Te Grotenhuis, & Pelzer, 2013). Upon calculation, the retention (SB value = 0.51; Cronbach's α = 0.50; *M* = 3.94; *SD* = 0.85; Range = 1.00-5.00) and application (SB value = 0.52; Cronbach's α = 0.51; *M* = 3.98; *SD*

= 0.86; Range = 1.00-5.00) dimensions were not reliable in the current sample. As such, only the acquisition dimension was used to operationalize perceived cognitive learning in subsequent hypothesis testing.

4.1.2 Parametric Assumptions

Next, the researcher checked for violations of the parametric assumptions of normality and linearity. First, visual inspections of histograms for each variable were conducted. Scales for personal connection, related humor, unrelated humor, and intrinsic motivation showed a semblance of normality. Scales for enjoyable interaction, responding to questions, demonstrating interest, teaching style, and perceived cognitive learning appeared to be slightly skewed towards the right. Second, Q-Q-plots were examined. Following a similar pattern, personal connection, related humor, unrelated humor, and intrinsic motivation showed relatively linear distributions. The other variables - enjoyable interaction, responding to questions, demonstrating interest, teaching style, and perceived cognitive learning - did not. Third, Kolmogorov-Smirnov tests revealed that data for all variables significantly deviated from a normal distribution ($p < 0.05$). Fourth, a residual plot was examined to explore multilinearity. Upon examining the data, no obvious non-random patterns were observed, suggesting the data were not multilinear.

Taken together, the data appeared to violate at least some of the assumptions of normality and linearity. However, the author chose to continue data analysis because these violations do not likely pose a threat to the value of the results (Lix, Keselman, & Keselman, 1996). Limitations related to this decision are discussed in Chapter 5.

4.1.3 Identifying Covariates

Correlations and group differences were explored among control variables and hypothesized variables to determine which control variables, if any, to include in data analysis. Correlations among continuous control variables (i.e., midterm grade, course size, previous instructor relationship, previous courses taken with an instructor, and desired relationship with instructor) and hypothesized variables can be found in Table 4.1. For each hypothesis, this correlation matrix was consulted to determine which control variables to include. Each of the five continuous control variables were significantly related to at least one hypothesized variable and thus were included at least once throughout hypothesis testing. Independent samples t-test were also calculated to explore whether the hypothesized variables differed based on instructor gender, the final nominal control variable. However, no significant group differences were found, so instructor gender was not used as a control variable in hypothesis testing.

4.2 Hypothesis Testing

The following details the results of hypothesis testing. Throughout, the preliminary analysis results dictated which statistical tests were most appropriate to use for each hypothesis based on measure dimensionality.

4.2.1 Hypothesis 1

Hypothesis 1 explored whether instructors' prosocial use of humor, both (a) related and (b) unrelated, was a significant, positive predictor of student perceptions of ISR. Based on the prior analysis to determine which variables to include for statistical control (see Table 4.1), midterm grade, course size, previous instructor relationship,

Table 4.1 Pearson correlations among hypothesis variables and control variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Related Humor														
2. Unrelated Humor	.435**													
3. Responding to Questions	.413**	-.030												
4. Demonstrating Interest	.470**	.040	.818**											
5. Teaching Style	.552**	.120**	.712**	.822**										
6. Enjoyable Interaction	.556**	.119**	.645**	.725**	.709**									
7. Personal Connection	.569**	.289**	.429**	.544**	.572**	.762**								
8. Intrinsic Motivation	.431**	-.020	.563**	.578**	.581**	.597**	.478**							
9. Perceived Cognitive Learning	.260**	-.223**	.604**	.571**	.549**	.514**	.314**	.726**						
10. Academic Performance	.060	-.050	.187**	.240**	.211**	.173**	.118**	.159**	.160**					
11. Midterm Grade	-.050	.050	-.170**	-.201**	-.172**	-.138**	-.068	-.139**	-.184**	-.473**				
12. Course Size	-.090*	.020	-.154**	-.230**	-.264**	-.154**	-.133**	-.115*	-.073	-.278**	.141**			
13. Previous Relationship	.144**	.090	.049	.131**	.171**	.138**	.179**	.046	.045	.070	-.063	-.157**		
14. Previous Courses Taken	.080	.110*	-.058	-.007	.020	-.019	-.003	.007	-.037	-.054	.065	-.037	.248**	
15. Desired Relationship	.165**	.138**	.222**	.239**	.222**	.290**	.328**	.312**	.249**	.163**	-.138**	-.123**	.084	-.017

**. Correlation is significant at the 0.01 level.

*. Correlation is significant at the 0.05 level.

previous courses taken with an instructor, and desired relationship with instructor were included as covariates. Because the CFA for ISR revealed two dimensions (enjoyable interaction and personal connection), two hierarchical regressions were used to test this hypothesis (Method: Enter). For each model, the control variables were entered as independent in block 1, the predictor variables (related and unrelated humor) were entered as independent in block 2, and the outcome variable (enjoyable interaction or personal connection) was entered as dependent in the SPSS dialogue box.

Enjoyable interaction was entered as the outcome variable in the first hierarchical regression. See Table 4.2 for regression weights (β), standard errors, t values, and significance levels of model predictors. Overall, the model was significant and accounted for 38.6% of variance (R^2) in enjoyable interaction [$F(7, 469) = 42.17$, $p < 0.001$]. At block one, the control variables significantly contributed to the model [F (5,471) = 12.34, $p < 0.001$], accounting for 11.6% of variance (R^2) in enjoyable interaction. At block two, introducing related and unrelated humor explained an additional 27.0% of variance (R^2) in enjoyable interaction, and this R^2 change was significant [F Change (2,469) = 103.35, $p < 0.001$]. Controlling for block 1 (control variables), related humor [$\beta = 0.58$, $t(469) = 14.17$, $p < 0.001$] was a significant, positive predictor of enjoyable interaction. However, unrelated humor [$\beta = -0.15$, $t(469) = -3.77$, $p < 0.001$] was a significant, negative predictor of enjoyable interaction.

Personal connection was entered as the outcome variable in the second hierarchical regression. See Table 4.2 for regression weights (β), standard errors, t values, and significance levels of model predictors. Overall, the model was significant and accounted for 39.5% of variance (R^2) in personal connection [$F(7, 469) = 43.67$, $p <$

Table 4.2 Regression weights (*B*), standard errors, *t* values, and significance levels for prosocial humor hierarchical regression models

Model	Predictor	*B*	*SE*	*t*	*p*
Outcome Variable: Enjoyable Interaction					
Model 1					
	Midterm Grade	-0.08	0.04	-1.81	0.07
	Course Size	-0.10	0.02	-2.16	0.03*
	Previous Relationship	0.11	0.03	2.33	0.02*
	Previous Courses	-0.04	0.07	-0.86	0.39
	Desired Relationship	0.26	0.04	5.84	0.00**
Model 2					
	Midterm Grade	-0.06	0.04	-1.63	0.10
	Course Size	-0.06	0.02	-1.61	0.11
	Previous Relationship	0.05	0.03	1.34	0.18
	Previous Courses	-0.05	0.06	-1.44	0.15
	Desired Relationship	0.20	0.04	5.21	0.00**
	Related Humor	0.58	0.04	14.17	0.00**
	Unrelated Humor	-0.15	0.03	-3.77	0.00**
Outcome Variable: Personal Connection					
Model 1					
	Midterm Grade	0.00	0.05	-0.10	0.92
	Course Size	-0.07	0.03	-1.65	0.10
	Previous Relationship	0.15	0.04	3.35	0.00*
	Previous Courses	-0.04	0.08	-0.84	0.40
	Desired Relationship	0.31	0.05	7.00	0.00**
Model 2					
	Midterm Grade	0.00	0.04	0.04	0.97
	Course Size	-0.05	0.02	-1.33	0.18
	Previous Relationship	0.09	0.03	2.45	0.02
	Previous Courses	-0.07	0.07	-1.80	0.07
	Desired Relationship	0.23	0.04	6.05	0.00**
	Related Humor	0.50	0.04	12.37	0.00**
	Unrelated Humor	0.04	0.04	0.99	0.32

* $p < .05$

** $p < .001$

0.001]. At block one, the control variables significantly contributed to the model [F (5,471) = 14.95, $p < 0.001$], accounting for 13.7% of variance (R^2) in personal connection. At block two, introducing related and unrelated humor explained an additional 25.8% of variance (R^2) in personal connection, and this R^2 change was significant [F Change (2,469) = 99.80, $p < 0.001$]. Controlling for block 1 (control variables), while related humor [$\beta = 0.50$, $t(469) = 12.37$, $p < 0.001$] was a significant, positive, predictor of personal connection, unrelated humor [$\beta = 0.04$, $t(469) = 0.99$, $p = 0.32$] was not a significant predictor of personal connection.

In summary, related humor (H1a) was a significant, positive predictor of both enjoyable interaction and personal connection. However, unrelated humor (H1b) was a significant negative, predictor of enjoyable interaction and not a significant predictor of personal connection. Given these results, while H1a was supported, H1b was not.

4.2.2 Hypothesis 2

Hypothesis 2 explored whether instructors' confirming behaviors – (a) responding to questions, (b) demonstrating interest, and (c) teaching style – were significant, positive predictors of student perceptions of ISR. Based on the prior analysis to determine which variables to include for statistical control (see Table 4.1), midterm grade, course size, previous instructor relationship, and desired relationship were included as covariates. Because the CFA for ISR revealed two dimensions (enjoyable interaction and personal connection), two hierarchical regressions were used to test this hypothesis (Method: Enter). For each model, the control variables were entered as independent in block 1, the predictor variables (responding to questions, demonstrating interest, and teaching style)

were entered as independent in block 2, and the outcome variable (enjoyable interaction or personal connection) was entered as dependent in the SPSS dialogue box.

Enjoyable interaction was entered as the outcome variable in the first hierarchical regression. See Table 4.3 for regression weights (β), standard errors, t values, and significance levels of model predictors. Overall, the model was significant and accounted for 58.5% of variance (R^2) in enjoyable interaction [$F(7, 469) = 94.39$, $p < 0.001$]. At block one, the control variables significantly contributed to the model [F (4,472) = 15.25, $p < 0.001$], accounting for 11.4% of variance (R^2) in enjoyable interaction. At block two, introducing all three dimensions of teacher confirmation (responding to questions, demonstrating interest, and teaching style) explained an additional 47.0% of variance (R^2) in enjoyable interaction, and this R^2 change was significant [F Change (3,469) = 177.16, $p < 0.001$]. Controlling for block 1 (control variables), responding to questions [$\beta = 0.11$, $t(469) = 2.07$, $p = 0.04$], demonstrating interest [$\beta = 0.35$, $t(469) = 5.37$, $p < 0.001$], and teaching style [$\beta = 0.33$, $t(469) = 6.19$, $p < 0.001$] were all significant, positive predictors of enjoyable interaction.

Personal connection was entered as the outcome variable in the second hierarchical regression. See Table 4.3 for regression weights (B), standard errors, t values, and significance levels of model predictors. Overall, the model was significant and accounted for 39.6% of variance (R^2) in personal connection [$F(7, 469) = 43.93$, $p < 0.001$]. At block one, the control variables significantly contributed to the model [F (4,472) = 18.52, $p < 0.001$], accounting for 13.6% of variance (R^2) in personal connection. At block two, introducing all three dimensions of teacher confirmation (responding to questions, demonstrating interest, and teaching style) explained an

Table 4.3 Regression weights (*B*), standard errors, *t* values, and significance levels for teacher confirmation hierarchical regression models

Model	Predictor	*B*	*SE*	*t*	*p*
Outcome Variable: Enjoyable Interaction					
Model 1					
	Midterm Grade	-0.08	0.04	-1.89	0.06
	Course Size	-0.10	0.02	-2.15	0.03*
	Previous Relationship	0.10	0.03	2.18	0.03*
	Desired Relationship	0.26	0.04	5.87	0.00**
Model 2					
	Midterm Grade	0.18	0.03	0.59	0.55
	Course Size	0.05	0.02	1.48	0.14
	Previous Relationship	0.03	0.02	0.95	0.34
	Desired Relationship	0.12	0.03	3.72	0.00**
	Responding to Questions	0.11	0.06	2.07	0.04*
	Demonstrating Interest	0.35	0.07	5.37	0.00**
	Teaching Style	0.33	0.05	6.19	0.00**
Outcome Variable: Personal Connection					
Model 1					
	Midterm Grade	-0.01	0.05	-0.17	0.87
	Course Size	-0.07	0.03	-1.64	0.10
	Previous Relationship	0.14	0.04	3.25	0.00*
	Desired Relationship	0.31	0.05	7.03	0.00**
Model 2					
	Midterm Grade	0.06	0.05	1.70	0.90
	Course Size	0.04	0.02	1.17	0.24
	Previous Relationship	0.08	0.03	2.05	0.04
	Desired Relationship	0.21	0.04	5.56	0.00**
	Responding to Questions	-0.10	0.09	-1.58	0.11
	Demonstrating Interest	0.28	0.10	3.57	0.00**
	Teaching Style	0.39	0.08	5.86	0.00**

* $p < .05$

** $p < .001$

additional 26.0% of variance (R^2) in personal connection, and this R^2 change was significant [F Change (3,469) = 67.38, $p < 0.001$]. Controlling for block 1 (control variables), demonstrating interest [$\beta = 0.28$, $t(469) = 3.57$, $p < 0.001$] and teaching style [$\beta = 0.38$, $t(469) = 5.86$, $p < 0.001$] were significant, positive predictors of personal connection. However, responding to questions [$\beta = -0.10$, $t(469) = -1.58$, $p = 0.11$] was not a significant predictor.

In summary, demonstrating interest (H2b) and teaching style (H2c) were significant, positive predictors of both enjoyable interaction and personal connection. While responding to questions (H2a) was a significant, positive predictor of enjoyable interaction, it was not a significant predictor of personal connection. Given these results, while H2b and H2c were supported, H2a was only partially supported.

4.2.3 Hypothesis 3

Hypothesis 3 explored whether perceived ISR (enjoyable interaction and personal connection) was a significant, positive predictor of students' (a) intrinsic motivation, (b) perceived cognitive learning, and (c) academic performance. Based on the prior analysis to determine which variables to include for statistical control (see Table 4.1), midterm grade, course size, previous instructor relationship, and desired relationship with instructor were included as covariates. Given that each multi-item student outcome was best represented unidimensionally in the CFAs, three hierarchical regressions were used to test this hypothesis (Method: Enter). For each model, the control variables were entered as independent in block 1, the predictor variables (enjoyable interaction and. personal connection) were entered as independent in block 2, and the outcome variable

(intrinsic motivation, perceived cognitive learning, or academic performance) was entered as dependent in the SPSS dialogue box.

Intrinsic motivation was entered as the outcome variable in the first hierarchical regression. See Table 4.4 for regression weights (β), standard errors, t values, and significance levels of model predictors. Overall, the model was significant and accounted for 38.1% of variance (R^2) in intrinsic motivation [$F(6, 470) = 48.28$, $p < 0.001$]. At block one, the control variables significantly contributed to the model [$F(4,472) = 14.72$, $p < 0.001$], accounting for 11.1% of variance (R^2) in intrinsic motivation. At block two, introducing both dimensions of ISR (enjoyable interaction and personal connection) explained an additional 27.0% of variance (R^2) in intrinsic motivation, and this R^2 change was significant [F Change $(2,470) = 102.71$, $p < 0.001$]. Controlling for block 1 (control variables), while enjoyable interaction [$\beta = 0.53$, $t(470) = 9.34$, $p < 0.001$] was a significant, positive predictor of intrinsic motivation, personal connection [$\beta = 0.03$, $t(470) = 0.53$, $p = 0.60$] was not a significant predictor.

Perceived cognitive learning was entered as the outcome variable in the second hierarchical regression. See Table 4.5 for regression weights (β), standard errors, t values, and significance levels of model predictors. Overall, the model was significant and accounted for 30.5% of variance (R^2) in perceived cognitive learning [$F(6, 470) = 34.37$, $p < 0.001$]. At block one, the control variables significantly contributed to the model [$F(4,472) = 11.08$, $p < 0.001$], accounting for 8.6% of variance (R^2) in perceived cognitive learning. At block two, introducing both dimensions of ISR (enjoyable interaction and personal connection) explained an additional 21.9% of variance (R^2) in perceived cognitive learning, and this R^2 change was significant [F Change $(2,470) =$

Table 4.4 Regression weights (*B*), standard errors, *t* values, and significance levels for instructor-student rapport hierarchical regression model predicting intrinsic motivation

Model	Predictor	*B*	*SE*	*t*	*p*
Model 1					
	Midterm Grade	-0.09	0.04	-2.02	0.04*
	Course Size	-0.07	0.02	-1.47	0.14
	Previous Relationship	0.01	0.03	0.14	0.89
	Desired Relationship	0.29	0.04	6.59	0.00**
Model 2					
	Midterm Grade	-0.05	0.03	-1.21	0.23
	Course Size	-0.01	0.02	-0.33	0.74
	Previous Relationship	-0.05	0.02	-1.32	0.19
	Desired Relationship	0.15	0.03	3.72	0.00**
	Enjoyable Interaction	0.53	0.05	9.34	0.00**
	Personal Connection	0.03	0.04	0.53	0.60

* $p < .05$

** $p < .001$

Table 4.5 Regression weights (*B*), standard errors, *t* values, and significance levels for instructor-student rapport hierarchical regression model predicting perceived cognitive learning

Model	Predictor	*B*	*SE*	*t*	*p*
Model 1					
	Midterm Grade	-0.15	0.04	-3.33	0.00*
	Course Size	-0.02	0.02	-0.50	0.62
	Previous Relationship	0.01	0.03	0.29	0.77
	Desired Relationship	0.23	0.04	5.02	0.00**
Model 2					
	Midterm Grade	-0.10	0.04	-2.50	0.01
	Course Size	0.02	0.02	0.57	0.57
	Previous Relationship	-0.02	0.03	-0.45	0.65
	Desired Relationship	0.13	0.04	3.05	0.00*
	Enjoyable Interaction	0.63	0.05	10.43	0.00**
	Personal Connection	-0.21	0.05	-3.39	0.00*

* $p < .05$

** $p < .001$

74.10, $p < 0.001$]. Controlling for block 1 (control variables), while enjoyable interaction [$\beta = 0.63$, $t(470) = 10.43$, $p < 0.001$] was a significant, positive predictor of perceived cognitive learning, personal connection [$\beta = -0.21$, $t(470) = -3.39$, $p < 0.05$] was a significant, negative predictor.

Academic performance was entered as the outcome variable in the third hierarchical regression. See Table 4.6 for regression weights (β), standard errors, t values, and significance levels of model predictors. For the model, the author chose not to control for midterm grade. Given the point in the semester when survey responses were collected, it is possible that a student's midterm grade included the grade for their last major assignment (academic performance). Because there was no way to tell whether this was the case for particular students, the variable was not included in the model. Overall, the model was significant and accounted for 10.6% of variance (R^2) in academic performance [$F(5, 470) = 11.18$, $p < 0.001$]. At block one, the control variables significantly contributed to the model [$F(3,472) = 16.44$, $p < 0.001$], accounting for 9.5% of variance (R^2) in academic performance. At block two, introducing both dimensions of ISR (enjoyable interaction and personal connection) explained an additional 1.2% of variance (R^2) in academic performance, and this R^2 change was significant [F Change $(2,470) = 3.06$, $p < 0.05$]. Controlling for block 1 (control variables), while enjoyable interaction [$\beta = 0.16$, $t(470) = 2.29$, $p < 0.05$] was a significant, positive predictor of academic performance, personal connection [$\beta = -0.07$, $t(470) = -1.04$, $p = 0.30$] was not a significant predictor.

Table 4.6 Regression weights (*B*), standard errors, *t* values, and significance levels for instructor-student rapport hierarchical regression model predicting academic performance

Model	Predictor	*B*	*SE*	*t*	*p*
Model 1					
	Course Size	-0.26	0.24	-5.81	0.00**
	Previous Relationship	0.02	0.35	0.39	0.69
	Desired Relationship	0.13	0.47	2.95	0.00*
Model 2					
	Course Size	-0.25	0.24	-5.55	0.00**
	Previous Relationship	0.01	0.35	0.28	0.78
	Desired Relationship	0.11	0.49	2.38	0.02*
	Enjoyable Interaction	0.16	0.73	2.29	0.02*
	Personal Connection	-0.07	0.62	-1.04	0.30

* $p < .05$

** $p < .001$

In summary, enjoyable interaction was a significant, positive predictor of all three student outcomes: (H3a) intrinsic motivation, (H3b) perceived cognitive learning, and (H3c) academic performance. While personal connection was not a significant predictor of either (H3a) intrinsic motivation or (H3c) academic performance, it was a significant, negative predictor of (H3b) perceived cognitive learning. Given these results, Hypotheses $3_{a\text{-}c}$ were partially supported.

4.2.4 Hypothesis 4

Hypothesis 4 explored whether ISR (enjoyable interaction and personal connection) positively mediated the relationship between instructors' prosocial use of humor (related and unrelated) and student outcomes – (a) intrinsic motivation, (b) perceived cognitive learning, and (c) academic performance. Based on the prior analysis to determine which variables to include for statistical control (see Table 4.1), midterm grade, course size, previous instructor relationship, previous courses taken with an instructor, and desired relationship with instructor were included as covariates. Based on the CFA results, six parallel mediation models (Model 4)[2] in Hayes' (2018) regression-based PROCESS macro in SPSS were used to test this hypothesis.[3] For a visual depiction

[2] Because the CFA for the MRM used to operationalize ISR revealed two dimensions, parallel mediation procedures were used instead of simple mediation. When testing indirect effects through student psychological need fulfillment, these parallel models provide the same evidence of utility for SDT when compared to a simple mediation model (Goldman et al., 2017).

[3] The author chose to employ a regression-based approach for path analysis (PROCESS; Hayes, 2018) rather than structural equation modeling (SEM) procedures for several reasons. First, when conducting path analyses, differences in direct and indirect effects resulting from both procedures are inconsequential (Hayes, Montoya, & Rockwood, 2017). Second, the present study was not concerned with the fit of an overall model nor was it conducted to forward a single model for predicting student outcomes to account for ISR's variance. Thus, the benefits of model estimation granted by SEM would not have much added value to this exploratory study (Hayes, 2018). Third, it is possible that readers could be concerned with problems produced by measurement error in latent models, particularly because the results of CFA models demonstrated overall poor fit. While this view is defensible, the majority of research published in our field does not account for such measurement error (e.g., in simple regression analyses), so only applying this

of these models, see Figure 4.1. For each hypothesis, the humor type (related or unrelated) was entered as X variable (independent variable), enjoyable interaction and personal connection were entered as Mediator(s) M, and the student outcome (intrinsic motivation, perceived cognitive learning, or academic performance) was entered as Y variable (dependent variable). Holding covariates constant, these procedures provided unstandardized coefficients, standard errors, confidence intervals, and completely standardized indirect effects (effect size) using bias-corrected bootstrapping results from 5000 samples. Evidence of significant direct and indirect effects (mediation) was reflected by a confidence interval not containing 0.[4] Full model statistics can be found in Table 4.7 for related humor and in Table 4.8 for unrelated humor.

Intrinsic motivation was entered as Y variable in the first two parallel mediation models. For related humor, indirect effects through each dimension of ISR on intrinsic motivation were as follows: enjoyable interaction [$a_1b_1 = 0.19$, 95% CI = 0.13 to 0.25, $ab_{cs} = 0.25$] and personal connection [$a_2b_2 = -0.01$, 95% CI = -0.06 to 0.04, $ab_{cs} = -0.01$]. For unrelated humor, indirect effects through each dimension of ISR on intrinsic motivation were as follows: enjoyable interaction [$a_1b_1 = 0.03$, 95% CI = 0.00 to 0.06,

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criticism to regression-based path analysis in PROCESS is inconsistent. In fact, although less powerful in detecting such issues, latent mediation analysis may be more accurate in the estimation of effects than observed variable analysis in a variety of cases, as biases in the estimation of one parameter can be counterbalanced by biases present in another parameter in the opposite direction in SEM (Hayes et al., 2017).

[4] Scholars have relied heavily on Baron and Kenny's (1986) procedures for determining if an independent variable affects a dependent variable through some mediator. This procedure relies on the disappearance (i.e., full mediation), or significant decrease (i.e., partial mediation), of the independent variable's effect on the dependent variable (c') when introducing the mediator into the model. However, more modern methods have moved past these labels and criteria when describing mediated effects, only requiring indirect effects through mediators to have confidence intervals not containing zero (Hayes, 2018). This is a widely accepted practice and considered more statistically valid than Baron and Kenny's approach (Zhao, Lynch, & Chen, 2010).

Figure 4.1 Instructor-student rapport as a parallel mediator (enjoyable interaction and personal connection) between instructor behaviors and student outcomes

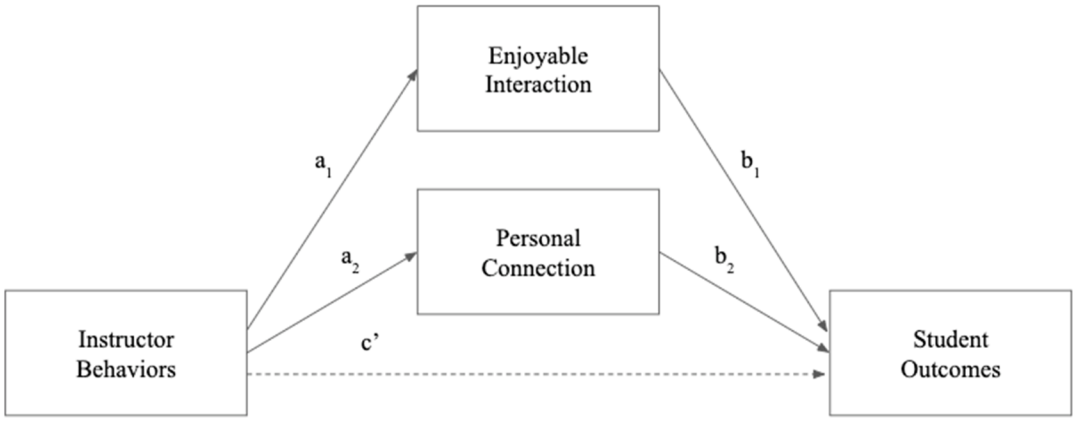

Table 4.7 Unstandardized path coefficients, standard errors, confidence intervals, and completely standardized indirect effects for parallel mediation models with related humor predicting student outcomes

Path		Coeff.	*SE*	95% CI (lower, upper)	ab_{cs}
All Models					
a1	Related Humor → EI	0.46	0.03	(0.40, 0.53)*	-
a2	Related Humor → PC	0.56	0.04	(0.49, 0.64)*	-
H4a (IM, Intrinsic Motivation)					
b1	EI → IM	0.40	0.05	(0.31, 0.49)*	-
b2	PC → IM	-0.01	0.04	(-0.09, 0.06)	-
c'	Related Humor → IM	0.11	0.03	(0.05, 0.18)*	-
a1b1	Related Humor → EI → IM	0.19	0.03	(0.13, 0.25)*	0.25
a2b2	Related Humor → PC → IM	-0.01	0.02	(-0.06, 0.04)	-0.01
Total Indirect Effect	Related Humor → EI // PC → IM	0.18	0.03	(0.13, .24)*	0.24
H4b (PCL, Perceived Cognitive Learning)					
b1	EI → PCL	0.56	0.06	(0.45, .0.67)*	-
b2	PC → PCL	-0.16	0.05	(-0.25, -0.07)*	-
c'	Related Humor → PCL	0.01	0.04	(-0.07, 0.09)	-
a1b1	Related Humor → EI → PCL	0.26	0.03	(0.20, 0.33)*	0.32
a2b2	Related Humor → PC → PCL	-0.09	0.03	(-0.14, -0.03)*	-0.11
Total Indirect Effect	Related Humor → EI // PC → PCL	0.17	0.03	(0.11, 0.23)*	0.21
H4c (AP; Academic Performance)					
b1	EI → AP	0.94	0.69	(-0.41, 2.29)	-
b2	PC → AP	-0.07	0.58	(-1.21, 1.07)	-
c'	Related Humor → AP	-0.31	0.48	(-1.25, 0.64)	-
a1b1	Related Humor → EI → AP	0.44	0.35	(-0.22, 1.14)	0.05
a2b2	Related Humor → PC → AP	-0.04	0.33	(-0.71, 0.58)	0.00
Total Indirect Effect	Related Humor → EI // PC → AP	0.40	0.32	(-0.23, 1.04)	0.04

Note. All reported effects hold midterm grade, course size, previous instructor relationship, previous courses with an instructor, and desired relationship with instructor constant; EI, Enjoyable Interaction; PC, Personal Connection; ab_{cs}, completely standardized indirect effect

*Effect is significant at $p < .05$ (CI excluding 0)

Table 4.8 Unstandardized path coefficients, standard errors, confidence intervals, and completely standardized indirect effects for parallel mediation models with unrelated humor predicting student outcomes

Path		Coeff	*SE*	95% CI (lower, upper)	ab_{cs}
All Models					
a1	Unrelated Humor → EI	0.07	0.04	(0.00, 0.14)*	-
a2	Unrelated Humor → PC	0.24	0.04	(0.16, 0.32)*	-
H4a (IM, Intrinsic Motivation)					
b1	EI → IM	0.42	0.05	(0.32, 0.51)*	-
b2	PC → IM	0.06	0.04	(-0.02, 0.14)	-
c'	Unrelated Humor → IM	-0.08	0.03	(-0.13, -0.03)*	-
a1b1	Unrelated Humor → EI → IM	0.03	0.02	(0.00, 0.06)*	0.05
a2b2	Unrelated Humor → PC → IM	0.01	0.01	(-0.01, 0.04)	0.02
Total Indirect Effect	Unrelated Humor → EI // PC → IM	0.04	0.02	(0.00, 0.08)*	0.07
H4b (PCL, Perceived Cognitive Learning)					
b1	EI → PCL	0.51	0.05	(0.41, 0.61)*	-
b2	PC → PCL	-0.06	0.05	(-0.15, 0.03)	-
c'	Unrelated Humor → PCL	-0.21	0.03	(-0.26, -0.15)*	-
a1b1	Unrelated Humor → EI → PCL	0.04	0.02	(0.00, 0.07)*	0.05
a2b2	Unrelated Humor → PC → PCL	-0.01	0.01	(-0.04, 0.01)	-0.02
Total Indirect Effect	Unrelated Humor → EI // PC → PCL	0.02	0.02	(-0.02, 0.06)	0.03
H4c (AP; Academic Performance)					
b1	EI → AP	0.75	0.67	(-0.57, 2.08)	-
b2	PC → AP	-0.03	0.58	(-1.17, 1.12)	-
c'	Unrelated Humor → AP	-0.30	0.37	(-1.03, 0.42)	-
a1b1	Unrelated Humor → EI → AP	0.05	0.06	(-0.04, 0.21)	0.01
a2b2	Unrelated Humor → PC → AP	0.00	0.14	(-0.31, 0.28)	0.00
Total Indirect Effect	Unrelated Humor → EI // PC → AP	0.05	0.12	(-0.18, 0.29)	0.01

Note. All reported effects hold midterm grade, course size, previous instructor relationship, previous courses with an instructor, and desired relationship with instructor constant; EI, Enjoyable Interaction; PC, Personal Connection; ab_{cs}, completely standardized indirect effect

*Effect is significant at $p < .05$ (CI excluding 0)

ab_{cs} = 0.05] and personal connection [a_2b_2 = 0.01, 95% CI = -0.01 to 0.04, ab_{cs} = 0.02]. Across both models, indirect effects through enjoyable interaction were positive, significant, and showed evidence of mediation. However, indirect effects through personal connection were not significant and did not show evidence of mediation. H4a was partially supported.

Perceived cognitive learning was entered as Y variable in the next two parallel mediation models. For related humor, indirect effects through each dimension of ISR on perceived cognitive learning were as follows: enjoyable interaction [a_1b_1 = 0.26, 95% CI = 0.20 to 0.33, ab_{cs} = 0.32] and personal connection [a_2b_2 = -.09, 95% CI = -0.15 to -0.03, ab_{cs} = -0.11]. For unrelated humor, indirect effects through each dimension of ISR on perceived cognitive learning were as follows: enjoyable interaction [a_1b_1 = 0.04, 95% CI = 0.00 to 0.07, ab_{cs} = 0.05] and personal connection [a_2b_2 = -0.01, 95% CI = -0.04 to 0.01, ab_{cs} = -0.02]. Across both models, indirect effects through enjoyable interaction were positive, significant, and showed evidence of mediation. For personal connection, while the indirect effect for related humor was significant and showed evidence of mediation (albeit a negative effect), the indirect effect for unrelated humor was not. H4b was partially supported.

Academic performance was entered as Y variable in the final two parallel mediation models. For related humor, indirect effects through each dimension of ISR on academic performance were as follows: enjoyable interaction [a_1b_1 = 0.44, 95% CI = -0.22 to 1.14, ab_{cs} = 0.05] and personal connection [a_2b_2 = -0.04, 95% CI = -0.71 to 0.58, ab_{cs} = 0.00]. For unrelated humor, indirect effects through each dimension of ISR on academic performance were as follows: enjoyable interaction [a_1b_1 = 0.05, 95% CI = -

0.04 to 0.21, ab_{cs} = 0.01] and personal connection [a_2b_2 = 0.00, 95% CI = -0.31 to 0.28, ab_{cs} = 0.00]. Across both models, indirect effects through enjoyable interaction and personal connection were not significant and did not show evidence of mediation. H4c was not supported.

4.2.5 Hypothesis 5

Hypothesis 5 explored whether ISR (enjoyable interaction and personal connection) mediated the relationship between instructors' confirming behaviors (responding to questions, demonstrating interest, and teaching style) and student outcomes – (a) intrinsic motivation, (b) perceived cognitive learning, and (c) academic performance. Based on the prior analysis to determine which variables to include for statistical control (see Table 4.1), midterm grade, course size, previous instructor relationship, and desired relationship with instructor were included as covariates. Based on the CFA results, nine parallel mediation models (Model 4) in Hayes' (2018) regression-based PROCESS macro in SPSS were used to test this hypothesis. For a visual depiction of these models, see Figure 4.1. For each hypothesis, the dimension of confirmation (responding to questions, demonstrating interest, or teaching style) was entered as X variable (independent variable), enjoyable interaction and personal connection were entered as Mediator(s) M, and the student outcome (intrinsic motivation, perceived cognitive learning, or academic performance) was entered as Y variable (dependent variable). Holding covariates constant, these procedures provided unstandardized coefficients, standard errors, confidence intervals, and completely standardized indirect effects (effect size) using bias-corrected bootstrapping results from 5000 samples. Evidence of significant direct and indirect effects (mediation) was

reflected by a confidence interval not containing 0. Full model statistics can be found in Table 4.9 for responding to questions, Table 4.10 for demonstrating interest, and Table 4.11 for teaching style.

Intrinsic motivation was entered as Y variable in the first three parallel mediation models. For responding to questions, indirect effects through each dimension of ISR on intrinsic motivation were as follows: enjoyable interaction [a_1b_1 = 0.17, 95% CI = 0.09 to 0.26, ab_{cs} = 0.19] and personal connection [a_2b_2 = 0.03, 95% CI = -0.01 to 0.07, ab_{cs} = 0.03]. For demonstrating interest, indirect effects through each dimension of rapport on intrinsic motivation were as follows: enjoyable interaction [a_1b_1 = 0.19, 95% CI = 0.09 to 0.30, ab_{cs} = 0.22] and personal connection [a_2b_2 = 0.02, 95% CI = -0.03 to 0.07, ab_{cs} = 0.02]. For teaching style, indirect effects through each dimension of rapport on intrinsic motivation were as follows: enjoyable interaction [a_1b_1 = 0.18, 95% CI = 0.09 to 0.28, ab_{cs} = 0.22] and personal connection [a_2b_2 = 0.00, 95% CI = -0.04 to 0.05, ab_{cs} = 0.00]. Across all three models, indirect effects through enjoyable interaction were positive, significant, and showed evidence of mediation. However, indirect effects through personal connection were not significant and did not show evidence of mediation. H5a was partially supported.

Perceived cognitive learning was entered as Y variable in the next three parallel mediation models. For responding to questions, indirect effects through each dimension of ISR on perceived cognitive learning were as follows: enjoyable interaction [a_1b_1 = 0.18, 95% CI = 0.10 to 0.28, ab_{cs} = 0.18] and personal connection [a_2b_2 = -0.05, 95% CI = -0.10 to -0.01, ab_{cs} = -0.05]. For demonstrating interest, indirect effects through each dimension of ISR on perceived cognitive learning were as follows: enjoyable interaction

Table 4.9 Unstandardized path coefficients, standard errors, confidence intervals, and completely standardized indirect effects for parallel mediation models with responding to questions predicting student outcomes

	Path	Coeff	*SE*	95% CI (lower, upper)	ab_{cs}
All Models					
a1	Responding to Questions → EI	0.67	0.04	(0.59, 0.75)*	-
a2	Responding to Questions → PC	0.50	0.06	(0.39, 0.61)*	-
H4a (IM, Intrinsic Motivation)					
b1	EI → IM	0.26	0.05	(0.15, 0.36)*	-
b2	PC → IM	0.05	0.04	(-0.02, 0.13)	-
c'	Responding to Questions → IM	0.28	0.04	(0.19, 0.36)*	-
a1b1	Responding to Questions → EI → IM	0.17	0.05	(0.09, 0.26)*	0.19
a2b2	Responding to Questions → PC → IM	0.03	0.02	(-0.01, 0.07)	0.03
Total Indirect Effect	Responding to Questions → EI // PC → IM	0.20	0.04	(0.13, 0.27)*	0.22
H4b (PCL, Perceived Cognitive Learning)					
b1	EI → PCL	0.27	0.06	(0.16, 0.39)*	-
b2	PC → PCL	-0.10	0.04	(-0.19, -0.02)*	-
c'	Responding to Questions → PCL	0.44	0.05	(0.35, 0.54)*	-
a1b1	Responding to Questions → EI → PCL	0.18	0.05	(0.10, 0.28)*	0.18
a2b2	Responding to Questions → PC → PCL	-0.05	0.02	(-0.10, -0.01)*	-0.05
Total Indirect Effect	Responding to Questions → EI // PC → PCL	0.13	0.04	(0.06, 0.20)*	0.13
H4c (AP; Academic Performance)					
b1	EI → AP	0.46	0.79	(-1.09, 2.00)	-
b2	PC → AP	-0.09	0.56	(-1.20, 1.01)	-
c'	Responding to Questions → AP	0.59	0.63	(-0.66, 1.83)	-
a1b1	Responding to Questions → EI → AP	0.31	0.55	(-0.80, 1.38)	0.03
a2b2	Responding to Questions → PC → AP	-0.05	0.29	(-0.62. 0.51)	0.00
Total Indirect Effect	Responding to Questions → EI // PC → AP	0.26	0.43	(-0.58, 1.10)	0.02

Note. All reported effects hold midterm grade, course size, previous instructor relationship, and desired relationship with instructor constant; EI, Enjoyable Interaction; PC, Personal Connection; ab_{cs}, completely standardized indirect effect

*Effect is significant at $p < .05$ (CI excluding 0)

Table 4.10 Unstandardized path coefficients, standard errors, confidence intervals, and completely standardized indirect effects for parallel mediation models with demonstrating interest predicting student outcomes

	Path	Coeff	*SE*	95% CI (lower, upper)	ab_{cs}
All Models					
a1	Demonstrating Interest → EI	0.75	0.04	(0.68, 0.81)*	-
a2	Demonstrating Interest → PC	0.64	0.05	(0.54, 0.74)*	-
H4a (IM, Intrinsic Motivation)					
b1	EI → IM	0.26	0.05	(0.15, 0.37)*	-
b2	PC → IM	0.03	0.04	(-0.05, 0.10)	-
c'	Demonstrating Interest → IM	0.27	0.05	(0.18, 0.36)*	-
a1b1	Demonstrating Interest → EI → IM	0.19	0.05	(0.09, 0.30)*	0.22
a2b2	Demonstrating Interest → PC → IM	0.02	0.03	(-0.03, 0.07)	0.02
Total Indirect Effect	Demonstrating Interest → EI // PC → IM	0.21	0.04	(0.13, 0.30)*	0.24
H4b (PCL, Perceived Cognitive Learning)					
b1	EI → PCL	0.30	0.06	(0.18, 0.42)*	-
b2	PC → PCL	-0.15	0.04	(-0.23, -0.06)*	-
c'	Demonstrating Interest → PCL	0.40	0.05	(0.29, 0.50)*	-
a1b1	Demonstrating Interest → EI → PCL	0.23	0.05	(0.13, 0.33)*	0.23
a2b2	Demonstrating Interest → PC → PCL	-0.09	0.03	(-0.16, -0.03)*	-0.10
Total Indirect Effect	Demonstrating Interest → EI // PC → PCL	0.13	0.04	(0.06, 0.22)*	0.14
H4c (AP; Academic Performance)					
b1	EI → AP	0.06	0.80	(-1.52, 1.63)	-
b2	PC → AP	-0.14	0.56	(-1.23, 0.96)	-
c'	Demonstrating Interest → AP	1.18	0.67	(-0.14, 2.50)	-
a1b1	Demonstrating Interest → EI → AP	0.04	0.64	(-1.20, 1.31)	0.00
a2b2	Demonstrating Interest → PC → AP	-0.09	0.36	(-0.82, 0.63)	-0.01
Total Indirect Effect	Demonstrating Interest → EI // PC → AP	-0.04	0.50	(-1.06, 0.93)	0.00

Note. All reported effects hold midterm grade, course size, previous instructor relationship, and desired relationship with instructor constant; EI, Enjoyable Interaction; PC, Personal Connection; ab_{cs}, completely standardized indirect effect

*Effect is significant at $p < .05$ (CI excluding 0)

Table 4.11 Unstandardized path coefficients, standard errors, confidence intervals, and completely standardized indirect effects for parallel mediation models with teaching style predicting student outcomes

Path		Coeff	*SE*	95% CI (lower, upper)	ab_{cs}
All Models					
a1	Teaching Style → EI	0.66	0.03	(0.60, 0.73)*	-
a2	Teaching Style → PC	0.62	0.05	(0.53, 0.71)*	-
H4a (IM, Intrinsic Motivation)					
b1	EI → IM	0.27	0.05	(0.17, 0.37)*	-
b2	PC → IM	0.01	0.04	(-0.07, 0.08)	-
c'	Teaching Style → IM	0.26	0.04	(0.18, 0.34)*	-
a1b1	Teaching Style → EI → IM	0.18	0.05	(0.09, 0.28)*	0.22
a2b2	Teaching Style → PC → IM	0.00	0.02	(-0.04, 0.05)	0.00
Total Indirect Effect	Teaching Style → EI // PC → IM	0.18	0.04	(0.11, 0.26)*	0.23
H4b (PCL, Perceived Cognitive Learning)					
b1	EI → PCL	0.35	0.05	(0.22, 0.46)*	-
b2	PC → PCL	-0.18	0.04	(-0.26, -0.09)*	-
c'	Teaching Style → PCL	0.35	0.05	(0.26, 0.44)*	-
a1b1	Teaching Style → EI → PCL	0.23	0.04	(0.15, 0.31)*	0.26
a2b2	Teaching Style → PC → PCL	-0.11	0.03	(-0.17, -0.05)*	-0.12
Total Indirect Effect	Teaching Style → EI // PC → PCL	0.12	0.04	(0.05, 0.19)*	0.14
H4c (AP; Academic Performance)					
b1	EI → AP	0.47	0.77	(-1.04, 1.99)	-
b2	PC → AP	-0.19	0.56	(-1.29, 0.91)	-
c'	Teaching Style → AP	0.58	0.60	(-0.61, 1.77)	-
a1b1	Teaching Style → EI → AP	0.31	0.57	(-0.76, 1.51)	0.03
a2b2	Teaching Style → PC → AP	-0.12	0.35	(-0.83, 0.56)	-0.01
Total Indirect Effect	Teaching Style → EI // PC → AP	0.19	0.47	(-0.69, 1.15)	0.02

Note. All reported effects hold midterm grade, course size, previous instructor relationship, and desired relationship with instructor constant; EI, Enjoyable Interaction; PC, Personal Connection; ab_{cs}, completely standardized indirect effect

*Effect is significant at $p < .05$ (CI excluding 0)

[a_1b_1 = 0.23, 95% CI = 0.13 to 0.33, ab_{cs} = 0.23] and personal connection [a_2b_2 = -0.09, 95% CI = -0.16 to -0.03, ab_{cs} = -0.10]. For teaching style, indirect effects through each dimension of ISR on perceived cognitive learning were as follows: enjoyable interaction [a_1b_1 = 0.23, 95% CI = 0.15 to 0.31, ab_{cs} = 0.26] and personal connection [a_2b_2 = -0.11, 95% CI = -0.17 to -0.05, ab_{cs} = -0.12]. Across all three models, indirect effects through enjoyable interaction were positive, significant, and showed evidence of mediation. Although negative, indirect effects through personal connection were also significant and showed evidence of mediation. H5b was partially supported.

Academic performance was entered as Y variable in the final three parallel mediation models. For responding to questions, indirect effects through each dimension of ISR on academic performance were as follows: enjoyable interaction [a_1b_1 = 0.31, 95% CI = -0.80 to 1.38, ab_{cs} = 0.03] and personal connection [a_2b_2 = -0.05, 95% CI = -0.62 to 0.51, ab_{cs} = 0.00]. For demonstrating interest, indirect effects through each dimension of ISR on academic performance were as follows: enjoyable interaction [a_1b_1 = 0.04, 95% CI = -1.20 to 1.31, ab_{cs} = 0.00] and personal connection [a_2b_2 = -0.09, 95% CI = -0.82 to 0.63, ab_{cs} = -0.01]. For teaching style, indirect effects through each dimension of ISR on academic performance were as follows: enjoyable interaction [a_1b_1 = 0.31, 95% CI = -0.76 to 1.51, ab_{cs} = 0.03] and personal connection [a_2b_2 = -0.12, 95% CI = -0.83 to 0.56, ab_{cs} = -0.01]. Across all three models, indirect effects through enjoyable interaction and personal connection were not significant and did not show evidence of mediation. H5c was not supported.

4.3 Chapter 4 Summary

Presented in this chapter were the results of preliminary analyses and hypothesis testing. To begin, CFAs were conducted to examine instrument dimensionality. After some modifications, all scales produced an acceptable fit except Frisby and Martin's (2010) Cognitive Learning Measure. As such, only the acquisition dimension was used for future hypothesis testing. Related humor (H1a) was a significant, positive predictor of both enjoyable interaction and personal connection, and H1a was supported. Unrelated humor (H1b) was a significant negative, predictor of enjoyable interaction and not a significant predictor of personal connection, so H1b was not supported. Demonstrating interest (H2b) and teaching style (H2c) were significant, positive predictors of both enjoyable interaction and personal connection, supporting H2b and H2c. While responding to questions (H2a) was a significant, positive predictor of enjoyable interaction, it was not a significant predictor of personal connection, so H2 was only partially supported. Enjoyable interaction was a significant, positive predictor of all three student outcomes: (H3a) intrinsic motivation, (H3b) perceived cognitive learning, and (H3c) academic performance. While personal connection was not a significant predictor of either (H3a) intrinsic motivation or (H3c) academic performance, it was a significant, negative predictor of (H3b) perceived cognitive learning. Given these results, Hypotheses $3_{a\text{-}c}$ were partially supported. For Hypothesis 4 and 5, in ten out of the fifteen parallel mediation models, the positive indirect effects through enjoyable interaction were significant, providing evidence of mediation. The only instances where enjoyable interaction was not a significant mediator were for models that included academic performance as the outcome. In contrast, there were no significant, positive indirect effects through personal connection. There were, however, four significant, negative

indirect effects when predicting perceived cognitive learning. Given these results, while H4a, H4b, H5a, and H5b were partially supported, H4c and H5c were not. These results will be interpreted and discussed in the subsequent chapter.

CHAPTER 5. DISCUSSION

There is a need to explore ways to better motivate students in instruction, as there have been marked declines in student motivation at all levels of education (Gnambs & Hanfstingl, 2016; Hidi & Harackiewicz, 2000; Lazowski & Hulleman, 2016). Researchers have suggested that developing instructor-student relationships is one way to promote optimal conditions for motivation and learning (Frymier & Houser, 2000; Mottet et al., 2006; Nussbaum & Scott, 1980). Instructor-student rapport (ISR), a widely-researched relational construct in instructional communication and psychology literature, has been linked to increased student motivation and learning, but more needs to be understood about what specific behaviors build rapport and what theoretical explanations best describe ISR's influence on student outcomes in the instructional process (Frisby & Buckner, 2018).

The current study had three primary purposes. First, Hypotheses 1 and 2 sought to explore whether instructors should employ prosocial humor and teacher confirmation to build ISR with students. Second, Hypothesis 3 investigated whether ISR increased students' intrinsic motivation, perceived cognitive learning, and academic performance. Finally, to examine the utility of self-determination theory (SDT) as a lens for understanding how ISR influences student outcomes, Hypotheses 4 and 5 tested whether ISR served as a mediator between instructors' rapport-building behaviors and student outcomes. The results of this study provide a unique, nuanced look at ISR's effects in the classroom and offer important implications for instructional communication scholarship and practice. Presented in this chapter are implications of results, limitations of the current study, and suggested future directions for ISR research.

5.1 Implications

The goal of this section was to interpret the study's findings and argue for their significance in light of what is already known about ISR in the instructional process. First, the results of preliminary analyses are discussed, focusing on the factor structure of the modified rapport measure (MRM; Frisby & Myers, 2008) and the influence of control variables. Second, the extent to which ISR influenced students' intrinsic motivation and cognitive learning is overviewed. Third, whether instructor's use of prosocial humor and confirmation aided in the building of ISR is considered. From these findings, practical implications are provided for instructors hoping to build ISR in the classroom. Fourth, the utility of SDT as a theoretical lens for understanding ISR is questioned based on the mixed findings of ISR's mediational role in the hypothesized models, concluding with this study's theoretical implications as a whole.

5.1.1 Confirming the Factor Structure of the MRM

While not an initial goal of the current study, the two-dimensional structure of the MRM confirmed by the preliminary CFA results has significant repercussions for future ISR research using this measure. Thus, it is an important first implication to highlight because it played a major role in shaping the interpretation of subsequent findings. This is the second known study to confirm the factor structure of the MRM using CFA procedures. In 2015, Frisby and Housley Gaffney sought to test the discriminant validity of the MRM and McCroskey, Sallinen, Fayer, Richmond, and Barraclough's (1996) measure of nonverbal immediacy. Following Hayes, Glynn, and Shanahan's (2005) model comparison procedures, results from their study suggested the MRM was a two-dimensional scale distinct from nonverbal immediacy. However, this three-factor model

did not demonstrate model fit. In other words, while their test did provide evidence that the MRM and nonverbal immediacy are distinct scales psychometrically, the MRM still did not demonstrate model fit on its own. While these findings remain important for forwarding ISR as a distinct instructional construct, they do not provide sufficient evidence to argue for the structural integrity of the MRM. In addition, DeVellis (2017) suggested a sample size of at least 300 when conducting CFAs. However, only 146 participants were included in Frisby and Housley Gaffney's study. This relatively small sample size has potential to threaten the reproducibility of their important findings. For these reasons, the CFA of the MRM conducted in this dissertation is important for ISR literature as a whole.

In the current data set, the unidimensional model of the MRM fit the data poorly, meeting none of the predetermined model fit criteria. This is troublesome, given that the vast majority of existing studies, despite previous research highlighting the likely multidimensional nature of the scale (Frisby & Housley Gaffney, 2015; Frisby & Myers, 2008), have utilized the MRM unidimensionally. The two-factor model of the MRM, after making a slight modification (i.e., correlating the error terms of two items), demonstrated acceptable model fit in this study. Given these results, future researchers should be wary of using the MRM as a unidimensional scale and instead consider the dimensions separately. Or, researchers should conduct a CFA of the scale using their own data when determining how to utilize the MRM for analyses. This is imperative because utilizing the MRM unidimensionally in analyses has the potential to mask more nuanced relationships that exist among ISR and other instructional variables.

For example, in the current study, Hypothesis 1 explored whether instructors' prosocial use of humor (related and unrelated) was a significant, positive predictor of student perceptions of ISR. While related humor was a significant, positive predictor of both dimensions of ISR, unrelated humor was not. In fact, an inverse relationship between unrelated humor and personal connection was revealed. A post-hoc replication of Hypothesis 1 using the same procedures but employing the MRM unidimensionally reveals different results. See Table 5.1 for regression weights (β), standard errors, t values, and significance levels of predictors for this post-hoc model. As expected, the model was significant and accounted for 43.2% of variance (R^2) in instructor-student rapport [$F(7, 469) = 50.97$, $p < 0.001$]. At block one, the control variables significantly contributed to the model [F (5,471) = 15.43, $p < 0.001$], accounting for 14.1% of variance (R^2) in ISR (unidimensional). At block two, introducing related and unrelated humor explained an additional 29.1% of variance (R^2) in ISR (unidimensional), and this R^2 change was significant [F Change (2,469) = 120.28, $p < 0.001$]. However, controlling for block 1 (control variables), only related humor [$\beta = 0.58$, $t(469) = 14.65$, $p < 0.001$] was a significant, positive predictor of ISR (unidimensional). Unrelated humor was not a significant predictor of ISR when considered unidimensionally in this post-hoc analysis [$\beta = -0.60$, $t(469) = -1.54$, $p = 0.13$]. Thus, if no CFA had been conducted and the MRM was only explored unidimensionally, the unique results of the current study, wherein unrelated humor was a significant, negative predictor of personal connection, could have been lost. Thus, future studies that only explore the MRM as a unidimensional scale run the risk of oversimplifying the nuanced role of ISR in instruction.

Table 5.1 Regression weights (*B*), standard errors, *t* values, and significance levels for a post-hoc hierarchical regression model with prosocial humor predicting the MRM unidimensionally

Model	Predictor	*B*	*SE*	*t*	*p*
Model 1					
	Midterm Grade	-0.05	0.05	-1.03	0.30
	Course Size	-0.09	0.02	-2.05	0.04
	Previous Relationship	0.14	0.03	3.05	0.00*
	Previous Courses	-0.04	0.07	-0.91	0.36
	Desired Relationship	0.30	0.04	6.90	0.00**
Model 2					
	Midterm Grade	-0.03	0.04	-0.88	0.38
	Course Size	-0.06	0.02	-1.62	0.11
	Previous Relationship	0.08	0.03	2.09	0.04
	Previous Courses	-0.07	0.06	-1.79	0.08
	Desired Relationship	0.22	0.04	6.21	0.00**
	Related Humor	0.58	0.04	14.65	0.00**
	Unrelated Humor	-0.06	0.03	-1.54	0.13

* $p < .05$

** $p < .001$

In addition to informing future research, this confirmed multidimensional factor structure considerably adds to existing ISR research; only three known articles have explored the relationship between ISR's two dimensions (enjoyable interaction and personal connection) and other instructional variables. Initially, Frisby and Myers (2008) found that both dimensions were related to student reports of participation, affective learning, state motivation, and student satisfaction with instructors. Later, Young et al. (2013) reported that both dimensions were related to classroom justice (procedural, interactional, and distributive), teacher confirmation (responding to questions, demonstrating interest, and teaching style), and affinity-seeking behaviors. Finally, Frisby and Housley Gaffney (2015) found that both dimensions of ISR were related to instructor nonverbal immediacy and predicted perceived cognitive learning and anticipated final grade. Thus, this study adds to the relatively small body of research that examines enjoyable interaction and personal connection independently and supports, supplements, and contradicts these existing findings.

5.1.2 Including Statistical Control Variables in ISR Research

The results of the current study controlled for the effects of classroom variables that were theoretically related to ISR: midterm grade, course size, previous instructor relationship, previous courses taken with an instructor, and desired relationship with instructor. Many existing studies that explore ISR have failed to include control variables in analyses, including some foundational articles in the ISR literature (e.g., Wilson et al., 2010). The instructor-student relationship is shaped by many factors within the instructional context (Mottet et al., 2006), and ignoring such variables may place the instructor-student relationship in a statistical vacuum that fails to capture the context in

which the relationship exists. As such, including statistical control variables when examining ISR helps to better account for factors that may play an important role in impacting the instructor-student relationship.

In the current study, two of the control variables - instructor gender and previous courses taken with an instructor - displayed little to no relationship with the study's hypothesized variables. However, the remaining four control variables - midterm grade, course size, previous instructor relationship, and desired relationship with instructor - displayed consistent, significant associations with this dissertation's hypothesized variables, including ISR (see Table 4.1). Future studies exploring ISR should include these and additional theoretically related control variables in their hypothesis testing. By doing so, researchers can help promote the ecological validity of their results and increase the readers' confidence in the veracity of their results and subsequent discussion (Salkind, 2010).

Of these variables, students' typical desire to develop a relationship with their instructor had the most notable effects across models in this study. Participants were asked to report on the extent to which they typically desire a relationship with their instructors in courses using a single item ("To what extent do you typically desire a relationship with your instructors in courses?") with a 5-point scale ranging from very *undesired* (1) to *very desired* (5). This item displayed significant associations with every hypothesized variable and remained a significant predictor in each of the hierarchical regression models used to test Hypotheses 1 - 3. McCroskey, Richmond, and McCroskey (2006) noted that students have unique orientations and predispositions towards communication in the classroom.

Similarly, students may have unique predispositions towards desiring relationships and relational interactions with their instructors in the classroom, just as existing research has shown that there are individual differences in the intensity and strength of the general need to belong (Baumeister & Leary, 1995; Vancouver & Ilgen, 1989). A descriptive look at this control item in the current study illustrates the variability in student desires to have relationships with their instructors in the classroom. On average, students reported somewhere between neutral to desired ($M = 3.19$) in terms of their preference toward instructor-student relationships. However, students reported desires at both ends of the spectrum, with 20 (4.2%) reporting relationships as very undesired, 42 (8.8%) reporting relationships as undesired, 262 (54.9%) reporting neutral views towards these relationships, 132 (27.7%) desiring relationships with their instructors, and 21 (4.4%) reporting relationships as very desired.

These varying orientations towards instructor-student relationships may influence how students react to rapport-building behaviors or benefit from perceptions of ISR. Some students may simply not want or need relationships with their instructor and thus remain largely unaffected by instructor-student relationships. Others may be predisposed to desiring relationships, greatly benefiting from developing relationships and engaging in social interaction with their instructor. At the very least, researchers exploring ISR in the future should consider including this item for statistical control in analyses. However, at a deeper level, ISR researchers should explore how this disposition or desire for instructor-student relationships differs among students and how this orientation influences the way students react to or benefit from ISR. Theoretically, perhaps the results of this dissertation should inform future work in SDT; exploring predispositions

towards individuals' fulfillment of phycological needs could be a fruitful direction for SDT research in other contexts.

Further, it should be noted that this concept of predisposition towards relationships and relational interaction has been discussed at length in interpersonal literature. In 1958, Schutz proposed a well-known model of interpersonal orientation. Schutz assumed that all people need people, and that individuals seek to establish relationships with other individuals in their social interactions. In seeking fulfilling interactions, Schutz explained individuals develop three primary interpersonal needs: inclusion, affection, and control. First, the need for inclusion is the need to sustain relationships with others, to be included in others' activities, and to include others in the individual's own activities. Individuals have varying strength of needs for both (a) including others and (b) needing to be included by others. Second, the need for affection is the need to form close, personal relationships with others characterized by warmth, intimacy, and love. Individuals have varying strength of needs for both (a) expressing affection towards others and (b) desiring affection to be expressed towards them. Third, the need for control is the need to maintain an acceptable balance of influence and power in relationships. Individuals have varying strength of needs for both (a) needing to control others and (b) needing to be controlled by others. These concepts are measured using the Fundamental Interpersonal Relations Orientations-Behavior (FIRO-B) scale, a tool that was intended to assess how individuals act in interpersonal situations, how a person behaves rather than how they feel, and how an individual characteristically related to others. While Schutz's FIRO-B is a larger, more complex concept than student's desire to

develop a relationship, future research may consider expanding on the control item to include a broader range of orientations when exploring ISR.

5.1.3 Instructor Rapport-Building Behaviors

The first overarching research question for this dissertation was as follows: what instructor behaviors help cultivate ISR? The contributions of two sets of instructor behaviors (prosocial humor and confirmation) were explored in the present study to answer this question.

5.1.3.1 Prosocial Humor as an Instructor Rapport-Building Behavior

Hypothesis 1 explored whether instructors' prosocial use of humor, both (a) related and (b) unrelated, was a significant, positive predictor of student perceptions of ISR (enjoyable interaction and person connection). Related humor (H1a) was a significant, positive predictor of both enjoyable interaction and personal connection. As such, H1a was supported. In contrast, unrelated humor (H1b) was a significant, negative predictor of enjoyable interaction and not a significant predictor of personal connection. Given these results, H1b was not supported. Taken together, these results help reveal unexplored nuances in the relationship between prosocial instructor humor and ISR.

No apparent previous research has explored how instructors' use of related and unrelated influences both dimensions of ISR separately. Richmond et al. (2015) found an association between related humor and a unidimensional scale of ISR, but no association was found between ISR and unrelated humor. The same year, Bolkan and Goodboy (2015) found that instructor humor orientation and rapport (measured using a unidimensional MRM) were related. As such, to the author's knowledge, this was the

first study to explore how each dimension of the MRM uniquely related to instructor's prosocial humor use.

Frymier et al. (2008) found that related humor was the most appropriate type of humor for instructors to employ in the classroom overall, so these positive results are not surprising. Appropriate humor has potential to foster shared experiences of enjoyment and facilitate liking through its connection to the psychological (i.e., coping with stress; Banas et al., 2001) and physical (i.e., relaxing tense students; Provine, 2000) states of students, so the strong effects of related humor in the current study are sensical. In practice, if instructors hope to build rapport with students, using related humor when presenting course content is a viable means for cultivating these feelings of warmth and closeness.

In contrast, this study's results suggest that using unrelated humor does not help instructors increase perceptions of ISR, somewhat consistent with Richmond et al. (2015). Making jokes or telling humorous stories that are not associated with course content does not make students feel like they have a closer relationship with their instructor (personal connection). In fact, according to these results, such quips may decrease students' feelings of amusement and warmth with their instructor (enjoyable interaction). While generally classified as an appropriate form of humor, the true appropriateness of unrelated humor is context-dependent (Frymier et al., 2008; Wanzer et al., 2006). Humor's appropriateness is contingent on meeting the expectations and norms for a particular context or situation (Spitzberg & Cupach, 1984), so unrelated humor that is appropriate in one classroom scenario may be inappropriate in another (Banas et al., 2011). Humor that is considered inappropriate may harm student perceptions of their

instructors (Gorham & Christophel, 1990; Torok, McMorris, & Lin, 2004). With this in mind, although unrelated humor has potential to elicit prosocial effects if perceived appropriately, the participants in the current sample could have perceived their instructor's use of unrelated humor as inappropriate, leading to decreased senses of enjoyment.

It is also possible that this negative effect is a result of students viewing unrelated humor as nonfunctional, seemingly in opposition to SDT. When instructors use related humor, students understand how it corresponds with course content. Unrelated humor, on the other hand, has no clear ties to the academic purposes of the course. So, this irrelevant humor does not help students accomplish their primary academic goal. These results are unsurprising when considering research done about students' motives for communicating with their instructors (Martin, Myers, & Mottet, 1999). Consistently across studies, the primary reason that students communicate with their instructors is for functional reasons (e.g., related to course requirements, materials, and assignments; Martin et al., 1999), while relational motives (e.g., to develop an interpersonal relationship with their instructor; Martin et al., 1999) are among the least common reasons students report communicating with their instructors (Cayanus, Martin, & Goodboy, 2009; Martin, Mottet, & Myers, 2000; Myers, Martin, & Mottet, 2002).

Furthermore, unrelated humor could make students feel like their time is wasted, taking away from their feelings of enjoyment because the instructor has focused on content that is off-topic from the course. Recent research by Goodboy and Myers (2015) notes that students dislike instructors who stray away from the subject of the course and believe their learning is negatively impacted when instructors are off topic. In the end,

this inverse relationship needs to be explored in more depth, potentially through qualitative means, to understand precisely why this prosocial type of humor can have antisocial effects.

5.1.3.2 Confirmation as an Instructor Rapport-Building Behavior

Hypothesis 2 explored whether instructors' confirming behaviors – (a) responding to questions, (b) demonstrating interest, and (c) teaching style – were significant, positive predictors of student perceptions of ISR (enjoyable interaction and person connection). Demonstrating interest (H2b) and teaching style (H2c) were both significant, positive predictors of enjoyable interaction and personal connection. Given these results, H2b and H2c were supported. However, responding to questions (H2a) was only a significant, positive predictor of enjoyable interaction; it was not a significant predictor of personal connection. So, H2a was only partially supported.

These results reiterate the findings of Young et al. (2013) who found positive associations among teaching style and both dimensions of ISR. Generally, students prefer more interactive-style teaching because they believe it makes learning more engaging and enjoyable (Costa, Van Rensburg, & Rushton, 2007). It is also likely that the increased communication and interaction between instructors and students that results from an interactive teaching style (Kong, Yan, & Lie, 2018), whether through in-class activities or instructor feedback, helps students feel closer to their instructors on a personal level. For example, Ridley (2007) noted that when instructors use role-playing, games, or activities as interactive teaching tools, students feel their communication with their instructors is more authentic and personal. If instructors hope to build ISR with students, they should

utilize an interactive teaching style to make instruction enjoyable and to connect more with students relationally.

As with Young et al. (2013), when students perceived that their instructors took a personal interest in their learning, reports of enjoyable interaction and personal connection increased. Ellis' (2000) conceptualization of confirmation emphasizes that confirming behaviors make students feel valued as individuals. Instructional communication research have long argued that when students feel seen or cared for by their instructors, the instructor-student relationship is strengthened and positive affective responses are produced (e.g., instructor caring; McCroskey & Teven, 1999). So, when students feel like they are seen as a person and not a number as a result of their instructor showing individualized interest in their learning, not only do their feelings of relational closeness increase, but they experience greater enjoyment interacting with their instructor.

The responding to questions dimension of confirmation was related to student reports of enjoyable interaction, confirming Young et al.'s (2013) findings. When students feel like teaching is tailored based on their feedback or questions, they enjoy the learning environment more (e.g., Bolkan & Goodboy, 2009). Likewise, it seems logical that student affect towards instruction could be decreased when their questions are ignored or glossed over. Listening plays important prosocial functions in relationships, leading to more productive and satisfying interactions (e.g., Bodie, Worthington, Imhof, & Cooper, 2008). So, the fact that students perceive interactions to be more enjoyable when their questions are heard and understood by their instructor aligns with existing literature.

However, unlike Young et al. (2013), responding to questions was not related to student perceptions of personal connection with their instructor in the present study. One possible explanation for this nonsignificance is that students enter the classroom with expectations about how their instructor should act (e.g., Frisby & Sidelinger, 2013). Specifically, students expect instructors to respond to their questions during class, as that is the role they have come to expect from educators in their time as a student (Myers & Knox, 2001). If this expectation is unmet, students may perceive their instructor negatively. However, if instructors take copious time to listen to student queries, therefore not violating or even positively violating their expectations, there may not be any changes in student perceptions of their instructor (see expectancy violations theory; Burgoon, 1978, 1993). Students perceive it is an instructor's job to answer questions, so they do not feel interpersonally closer to instructors who do so. In this way, answering questions serves only a rhetorical, not a relational, function (Mottet et al., 2006). To better make sense of these nuances, future research should again explore the relationship between responding to questions and personal connection.

5.1.3.3 Strategies for Instructor Rapport-Building

The results from Hypotheses 1 and 2 offer practical implications for instructors hoping to build rapport with students. Pedagogically, having specific instructor behaviors that are empirically linked to student perceptions of rapport is paramount (Frisby & Buckner, 2018). While these teaching tips are helpful for instructors, administrators could also benefit from understanding the impact of these behaviors. Administrators can better equip instructors to build ISR with their students by encouraging and incentivizing these behaviors.

Instructors should consider employing related humor in the classroom to build rapport with students. By looking at existing research and considering items used for measuring related humor in the current study, specific behaviors that may build ISR can be forwarded. When giving an example to illustrate an idea, explaining course assignments, or leading an activity, instructors should highlight content that students might find humorous (Wanzer el al., 2006). Humor is rooted in perception, so not all humor elicits laughter or entertainment for all students (Banas et al., 2011). As such, instructors should take an audience-centered approach when infusing course content with humor, focusing on what students will find funny and not what would make the instructor themselves chuckle. Apart from one-liners and humorous narratives, acting out course content or using funny media to illustrate a concept offers another approach to infusing instruction with humor (Frymier et al, 2008).

For example, Wanzer el al. (2006) reported that instructors can employ related humor by incorporating humorous videos in class to help explain course content. For instructors who may not feel comfortable delivering humorous content on their own, this approach could allow instructors to capitalize on the positive effects of related humor without running the risk of having their attempts at humor fall flat. However, instructors should be wary of using humor that is unrelated to course content, as it may not have an effect on student perceptions of instructor warmth or connection as anticipated. For example, while bringing up current events or political issues (unrelated to course content) may seem like a viable way to increase students' perceptions of enjoyment (Wanzer et al, 2006), the current sample suggests it does little to actually increase student perceptions of ISR.

Instructors should also consider using confirming behaviors to build ISR. Like with humor, specific behaviors that may build ISR can be outlined by considering extant research and referencing items used for measuring confirmation in the current study. By expressing interest in whether students are learning or checking in about how assignments are coming along, instructors can make their interactions with students more enjoyable and help build a personal connection (Ellis, 2000). An instructor can also develop ISR by communicating to students that he/she believes they can do well in the class. Ellis (2004) explained that in the university classroom, students are likely "striving to find out who they are, where they fit in, . . . and even whether they can succeed in college in general" (p. 16). In essence, students are discovering more about their personal, academic, and professional identities and capacities during their college years. Because of this, students have the potential to greatly benefit from instructors who express interest in their learning and speak directly into their need for identity development.

The style an instructor uses when teaching also shapes student perceptions of ISR. In general, students enjoy interacting with instructors who involve the actions or input of students when teaching. Students desire agency in the classroom, so a teaching style that individually considers student needs satisfies this craving (Reeve, 2013). This can be accomplished by using a variety of teaching techniques, including activities and exercises when appropriate, in an effort to help all students understand the course material (Ellis, 2000). Instructors should also check on students' understanding of course material before moving on to additional content. By not doing so, instructors run the risk of leaving students behind in their developmental knowledge of course material, creating an

unsatisfied and frustrated emotional state (Pritchett & Beatty, 2015). Giving oral or written feedback on students' work also helps to make students feel closer to their instructors. Existing instructional research that explores that role of instructor feedback emphasizes the fact that feedback has an important function in shaping student perceptions of their instructors and the learning context (e.g., Kerssen-Griep et al., 2008).

While not helpful in making students perceive a closer relationship with their instructors, instructors can help promote an enjoyable learning atmosphere in the way they respond to questions during class. Question-asking is an important avenue for students to participate in instruction and to better understand course content (Rocca, 2010). If not given an opportunity to ask questions, instructors run the risk of students misunderstanding course content or becoming frustrated (Aitken & Neer, 1993). It is important for instructors to indicate that they appreciate student questions and comments and be willing to slightly deviate from a lecture or explanation if a student asks questions. When a student does ask a question, instructors should listen attentively and be willing to take adequate time to answer students' questions fully (Ellis, 2000). Student may not be willing to continue asking questions during class if they perceive that their instructor does not listen closely to their queries. By doing these things, students are more likely to perceive their interactions with their instructor as warm and harmonious.

5.1.4 ISR's Influence on Student Outcomes

The second overarching research question for this dissertation was as follows: how can ISR help to promote positive instructional outcomes for students? To answer this question, Hypothesis 3 explored whether ISR (enjoyable interaction and person connection) was a significant, positive predictor of student reports of (a) intrinsic

motivation, (b) perceived cognitive learning, and (c) academic performance. While enjoyable interaction was a significant, positive predictor of all three outcomes, personal connection was not a significant, positive predictor of any student outcomes. In fact, personal connection was a significant, negative predictor of perceived cognitive learning. In the end, H3a-c were only partially supported.

Results from Hypothesis 3 provide evidence that student perceptions of enjoyable interaction help create conditions for increasing perceived cognitive learning and academic performance. A large number of studies exploring the link between ISR and cognitive learning have used unidimensional measures of rapport (Frisby et al., 2017; Frisby & Martin, 2010; Rogers, 2015; Ryan & Wilson, 2014; Wilson & Ryan, 2013). However, this study confirms Frisby and Housley Gaffney's (2015) results that on its own, the enjoyable interaction dimension of ISR is predictive of cognitive learning (both perceived and actual). Moving forward, more needs to be understood about exactly how this dimension helps influence cognitive learning. Apart from the sequence proposed by SDT, perhaps when students enjoy interacting with their instructors, they may be more likely to engage in on-task behaviors that help strengthen the acquisition of knowledge (Frisby & Housley Gaffney, 2015), like taking notes in class or thinking deeply about course materials. Or, students who are comfortable interacting with their relatable instructors could be more likely to engage in in-class behaviors that promote learning, like sharing ideas with their peers or participating in classroom discussions (Appleton, Christenson, & Furlong, 2008; Furrer & Skinner, 2003; Reeve, 2012).

The sequence outlined in the Affective Learning Model (ALM; Rodriguez, Plax, & Kearney, 1996) may also explain these relationships. The ALM argues that affective

learning (i.e., positive attitudes towards the instructor or class) mediates the relationship between instructor nonverbal immediacy and cognitive learning. That is, instructor communication and behavior can make students appreciate and enjoy learning, and these changes in affective learning are ultimately what produce changes in cognitive learning. Perhaps enjoyable interaction, which is related to affective learning (Frisby & Myers, 2008), influences learning outcomes in the same way. In light of each of these plausible explanations, having enjoyable interactions between instructors and students is important for promoting cognitive learning in college classrooms.

Results from Hypothesis 3 also supplement existing research by providing evidence that enjoyable interaction is related to an additional student outcome: intrinsic motivation. Frisby and Myers (2008) found a relationship between enjoyable interaction and state motivation. However, to a greater degree than state motivation, intrinsic motivation is relatively enduring and a considerable predictor of other positive student outcomes in the classroom (Fortier et al., 1995). Compared with other types of motivation, little is known about instructor communication and intrinsic motivation in our field (Goldman et al., 2017). Finding a relationship between enjoyable interaction and intrinsic motivation brings instructional communication researchers somewhat closer to understanding "the ideal conditions that intrinsically motivate students and help them to genuinely enjoy learning as a personally fulfilling experience" (Goldman et al., 2017, p. 187).

In contrast, results from Hypothesis 3 seem to contradict findings from Frisby and Housley Gaffney (2015) who found that personal connection was a significant predictor of academic performance. In the current sample, personal connection was *not* a

significant predictor of academic performance. Given that the control variables had a significant influence on students' academic performance across the models tested in this study, Frisby and Housley Gaffney might have found similar results if they had controlled for these variables. Another reason for the inconsistency could have been the varying operationalizations of academic performance. While the present study asked students to report actual grades of a major assignment, Frisby and Housley Gaffney asked students to report on their anticipated final grade. Scholars have argued that students are poor estimators of their own learning (King & Witt, 2009), and perhaps student estimates of their final grade could be equally problematic. Final course grades may also be overly dependent on assignments that measure participation and attendance rather than cognitive learning itself (Frisby et al, 2014). In either case, these differences in the operationalizations of cognitive learning have long been an area of concern for our field (Clark, 2004), and these findings warrant further consideration to understand how or if personal connection is related to student grades.

The most interesting contradiction, however, is that unlike Frisby and Housley Gaffney (2015), personal connection was a significant, negative predictor of perceived cognitive learning. This finding seems to run counter to existing literature that suggests ISR is related to perceived cognitive learning (Frisby et al., 2017; Frisby & Housley Gaffney, 2015; Frisby & Martin, 2010; Rogers, 2015; Ryan & Wilson, 2014; Wilson & Ryan, 2013). Further, this inverse relationship runs counter to the logic of SDT that suggests increased ISR (serving as a proxy for the satisfied need for relatedness) should correspond with increases in cognitive learning (e.g., Furrer & Skinner, 2003).

This unexpected relationship could exist as a consequence of several phenomena. To start, perhaps when students feel like they have grown especially close to their instructor or strongly care about them as a person, their attention shifts away from the learning process. This negative result of a strong instructor-student relationship is similar to how a workplace friendship may interfere with achieving professional goals and adequately filling formal roles (Pillemer & Rothbard, 2018). So, instead of devoting their attention to listening, thinking deeply about course content, or asking questions, students could be more preoccupied with maintaining this bond and interacting with their instructor socially, not academically. This shift of attention away from instructional content and activities could make students feel they have learned less (e.g., Young, Robinson, & Alberts, 2009).

This inverse relationship could also be attributed to students peering behind the proverbial curtain of the classroom and interacting with the instructor in a way that negates their credibility. In other words, if students develop a close relationship with their instructor and see first-hand who an instructor is as a person and peer, they may trust the instructor's intellectual jurisdiction to a lesser degree because they are simply seen as a friend (Johnson, 2011; Mazer, Murphy, & Simonds, 2007). Because of this, regardless of students' performance in their class or the content they have acquired, they perceive they have learned less. In both cases, more research needs to be done to verify (or refute) these results and to develop a deeper, empirically-supported understanding of this unexpected relationship.

Of course, it is possible that differences in operationalization between measures of perceived cognitive learning could explain this contrast in results. Frisby and Housley

Gaffney (2015) used the Learning Loss Measure (LL; Richmond, McCroskey, Kearney, & Plax, 1987). Although no measure of cognitive learning in instructional communication is perfect (Frisby et al., 2014), the LL is widely criticized for its operational inadequacies (Hess, Smythe, & Communication 451, 2001; Witt, Wheeless, & Allen, 2004). As a result, Frisby and Martin (2010) developed this study's measure of perceived cognitive learning to address common critiques of the LL and other existing measures (Frisby et al., 2014). These unexpected results could exist because of differences in these two scales. Further, because only the acquisition dimension of the Frisby and Martin's cognitive learning measure was used to operationalize perceived cognitive learning in the present study, the full scope of the larger concept of cognitive learning was not captured, potentially explaining why results differed. It is also likely that, as with academic performance, differences could be explained because of the inclusion of control variables in the current analyses.

Overall, Hypothesis 3 showed that enjoyable interaction had more utility than personal connection when predicting student outcomes. These results offer two important statistical possibilities that future ISR researchers might explore. First, given the stark differences in the effects of both dimensions, it seems possible that in past studies where researchers have used unidimensional models of the MRM to successfully predict student outcomes, that the strong effects of enjoyable interaction were masking nonsignificant (or even negative) effects of personal connection. Given this prospect, researchers who employed a unidimensional model of the MRM in past studies may consider reanalyzing their data, after conducting a CFA to confirm the MRM's multidimensionality, to see if their results display a similar pattern or remain the same.

Second, given that they are two dimensions from the same scale, there is a sizeable correlation between enjoyable interaction and personal connection ($r = 0.76$; $p < .001$). Because of the multiple regression procedures employed in Hypothesis 3, the resulting effects of personal connection are relative to the strength of enjoyable interaction. In other words, because both dimensions are related and share a significant amount of variance, the resulting insignificant effects of personal connection are partially a product of the very strong effect of enjoyable interaction as a result of biased estimation (e.g., multicollinearity). In this way, personal connection's change in sign and strength could be the result of a suppressor effect (i.e., the relationship between an IV and a DV is increased as a result of the statistical removal of variance explained by a third variable; Conger 1974). Assuming suppression, an alternative interpretation of these results may be that the portion of personal connection that is independent of enjoyable interaction is negatively related to perceived cognitive learning, but not the entire variable. The likelihood of suppression when including both dimensions of the MRM in multiple regression models should be explored (e.g., Pandey & Elliott, 2010).

A post-hoc analysis reveals that on its own, when excluding enjoyable interaction from the model and using the predetermined statistical control variables, personal connection is a significant, positive predictor for two of the three outcomes: intrinsic motivation [$\beta = 0.42$, $t(471) = 9.99$, $p < .001$] and perceived cognitive learning [$\beta = 0.26$, $t(471) = 9.99$, $p < .001$]. Even more interesting, personal connection becomes a significant positive, not a significant, negative predictor of perceived cognitive learning. Kalnis (2018) noted a similar pattern in their review of studies with highly related predictor variables. They suggested that in ordinary least squares (OLS) multiple

regression, estimating beta coefficients of highly correlated variables can become misleading. When multicollinearity exists, the weights of both variables could be inflated and in opposite directions even if their real effects are of the same sign and relatively small, leading to the chance of both Type 1 (i.e., false positive) and Type 2 (i.e., false negative) error. Future studies may consider using alternative regression approaches, such as principal component regression, that are better suited for statistically accounting for multicollinearity to explore the results of this hypothesis (Sawatsky, Clyde, & Meek, 2015).

5.1.5 SDT as a Theoretical Lens for ISR

The third, and final, research question for this dissertation was as follows: is SDT a viable theoretical lens for understanding ISR's role in instruction? Scholars have begun to explore the utility of employing SDT as a sensitizing lens in instructional communication research (e.g., Baker & Goodboy, 2018; Bolkan & Goodboy, 2015; Goldman et al., 2017). Similar to the hypotheses in these existing studies, to explore the applicability of SDT for understanding ISR's influence in instruction, Hypotheses 4 and 5 explored whether ISR served as a mediator between rapport-building behaviors and student outcomes. Intrinsic motivation is a key concept in SDT research with considerable research providing evidence that social contexts which support an individual's three psychological needs help to maintain intrinsic motivation (Deci & Ryan, 2012; Ryan & Deci, 2000a). Similarly, cognitive learning is a crucial student outcome for SDT research in education (Deci & Ryan, 1985, 1991). Across Hypotheses 4 and 5, significant, positive indirect effects through both dimensions of ISR predicting these outcomes could work to provide initial evidence of the theory's utility.

Table 5.2 helps to illustrate the mediational trends across the models used to test Hypotheses 4 and 5. In ten out of the fifteen models, the positive indirect effect through enjoyable interaction were significant, providing evidence of mediation. The only instances where enjoyable interaction was not a significant mediator were for models that included academic performance as the outcome. These non-significant effects are due to the relatively weak or non-significant influence of enjoyable interaction on academic performance found in Hypothesis 3. In contrast, there were no significant, positive indirect effects through personal connection. There were, however, four significant, negative indirect effects when predicting perceived cognitive learning (due to the negative direct effect of personal connection on perceived cognitive learning found in Hypothesis 3). Taken together, it stands to reason that while ISR as a global concept seems to serve as a conceptual proxy for the satisfied need for relatedness (Bolkan & Goodboy, 2015), ISR (particularly in its multidimensional from) does not serve as a consistent, statistical proxy for this psychological need in the current study.

Understanding how student relationships with their instructors may be inherently different from other interpersonal relationships could help to rationalize these results. Deci et al. (1991) described the need for relatedness as a desire to develop "secure and satisfying connections with others in one's social milieu" (Deci et al, 1991, p. 327). Perhaps students' perceived personal connection with their instructor has no association with their satisfied need for relatedness because students do not consider instructors as a part of their social 'milieu' (i.e., social network). In other words, although a personal connection between a student and their instructor may exist (i.e., students reported a close relationship with their instructor using the MRM), since the student may not view their

Table 5.2 Visual representation of Hypotheses 4 and 5 results

Instructor Behavior (x)	Student Outcome (Y)	Mediator (M)	
		Enjoyable Interaction	Personal Connection
Related Humor (H4)	Intrinsic Motivation	✓ (+)	X
	Perceived Cognitive Learning	✓ (+)	✓ (-)
	Academic Performance	X	X
Unrelated Humor (H4)	Intrinsic Motivation	✓ (+)	X
	Perceived Cognitive Learning	✓ (+)	X
	Academic Performance	X	X
Demonstrating Interest (H5)	Intrinsic Motivation	✓ (+)	X
	Perceived Cognitive Learning	✓ (+)	✓ (-)
	Academic Performance	X	X
Teaching Style (H5)	Intrinsic Motivation	✓ (+)	X
	Perceived Cognitive Learning	✓ (+)	✓ (-)
	Academic Performance	X	X
Responding to Questions (H5)	Intrinsic Motivation	✓ (+)	X
	Perceived Cognitive Learning	✓ (+)	✓ (-)
	Academic Performance	X	X

Note. ✓ (+), positive mediation; ✓ (-), negative mediation; X, no mediation.

instructor as part of their interpersonal ecosystem and thus not be psychological satisfied by this instructor relationship, personal connection may have little influence on student outcomes from an SDT perspective. Perhaps this is what Waldeck (2007) meant when she claimed that "students may perceive even their most personal experiences with instructors as serving a professional function, rather than a social one" (p. 429). In this case, perhaps student-student rapport, as explored by Frisby and Martin (2010) would have a more pronounced impact on students' psychological need fulfillment, as peers may more likely be seen as part of a student's social network.

This distinction is evocative of an important conversation that has taken place for decades in instructional communication literature about what makes the instructor-student relationship unique from other interpersonal relationships (see Sprague, 1993). In the early decades of instructional communication research, many scholars shared the perspective of Nussbaum and Scott (1979) who claimed that "while the instructional environment is unique in many respects, it also is a microcosm of the larger, interpersonal communication environment" (p. 578). This perspective continued to be a prevailing theme throughout literature, with scholars presuming that "when teachers and students … begin to see each other as individuals, interpersonal relationships form" (Frymier & Houser, 2000, p. 217).

The past several decades have not seen major advances in the understanding of what differentiates instructor-student relationships from other interpersonal ones (Lane, 2017). However, in recent years, some scholars have become more pronounced in their belief that instructor-student relationships should *not* be equated with typical interpersonal ones. Johnson, LaBelle, and Waldeck (2017) provided perhaps the most

thorough explication of this distinction. In their essay, Johnson et al. wrote that "teacher–student relationships are not interdependent in ways that intimate relationships are" (p. 116). Instructor-student interactions are typically limited to academic realms, so much of a student's life exists outside of the influence of an instructor. Additionally, they argued that "most teacher–student relationships eventually end and are rarely characterized by the same intimacy of interpersonal relationships" (p. 116). Students may only have an instructor once or twice during their time as a student; not all students may maintain relationships with their instructors post-graduation (Frisby, Sidelinger, & Tatum, 2019). A final key distinction between instructor-student relationships and interpersonal relationships is that "power differences substantively impact the nature of instructional relationships" (Johnson et al, 2017, p. 116).

Instead, Myers' (2017) suggested that it is more appropriate to view the instructor-student relationship as similar to a superior–subordinate relationship. Indeed, in summarizing the role of the superior in the superior–subordinate relationship, Sias (2009) explained that superiors act as sources of information, engage is appraisal of performance, and serve as mentors. In an overview of the field of instructional communication, it is clear that instructors serve similar functions with their students (Myers, 2017). Because of these functions, organizational researchers employing an SDT lens have focused more on leader's "role in establishing and maintaining a social context that allows employees to feel free to pursue experiences that satisfy these three needs" (Slemp, Kern, Patrick, & Ryan, 2018, p. 710) rather than on the depth of the relationship between a leader and their subordinate. In instruction, perhaps it is the instructor's job to create opportunities for students to develop meaningful relationships with peers rather

than to develop the relationships themselves in order to fulfill students' psychological needs for relatedness.

Overall, based on the results from this study, SDT does not seem to be a viable lens for understanding ISR as a multidimensional operationalization of relatedness in the instructional context. However, the consistent indirect effects through enjoyable interaction warrant further inquiry before ruling out the utility of the theory for explaining some aspects of ISR's role in the instructional process.

These findings highlight larger implications surrounding the use of SDT as a sensitizing lens in university classrooms. First, future researchers should continue to consider the extent to which various relationships in the instructional process contribute to the fulfillment of students' psychological need for relatedness. In the classroom, scholars have argued that the need for relatedness can be fulfilled in part by developing a sense of belongingness with their instructors, but that this need can also be satisfied with peer interactions (Niemiec & Ryan, 2009). Goldman et al. (2017) highlighted this distinction by measuring both senses of belonging on different dimensions of the Student Psychological Needs Scale. So, perhaps other relationships play a comparably larger role in fulfilling this psychological need than instructor-student relationships, as students may not be especially fulfilled by relationships with their instructors.

Even more broadly, perhaps it is problematic to frame student psychological needs as confined to the vacuum of the instructional context, ignoring that students bring in satisfied or thwarted needs that have little or anything to do with the classroom (Deci & Ryan, 2014). It is true; there is enough evidence in existing research to support the notion that classroom relationships, whether with an instructor or peers, have the

potential to contribute to individual feeling of belonging and relatedness. However, these temporary relationships, confined to three hours per week with limited interpersonal interaction, likely pale in comparison to the effects of other close personal relationships such as family (Kagitcibasi, 2013), friends (Demir & Özdemir, 2010), or romantic partners (Hadden, Smith, & Knee, 2014) outside of the classroom. Instead of operationalizing students' psychological need for relatedness using only items that relate to instruction, a more earnest application of SDT might operationalize this psychological need on a more comprehensive scale. When explored more generally, the insignificant mediated effects in the current study may be more readily justified.

5.2 Limitations

The theoretical and practical implications of this study must be interpreted within the scope of its limitations. First, the data appeared to violate the assumptions of normality and linearity. The researcher does acknowledge that non-normally distributed variables have potential to distort relationships and significance tests in regression, and that there is danger in continuing data analysis procedures in spite of violated parametric assumptions (Osborne & Waters, 2002). Despite this, the author chose to continue data analysis because these violations do not likely pose a threat to the value of the results (Lix, Keselman, & Keselman, 1996) given that researchers have provided evidence that linear regression analyses perform well with non-normal data and a relatively large sample size (n = 500; Lumley, Diehr, Emerson, & Chen, 2002).

Second, the cross-sectional design of the current study severely limits the validity of making sequential or mediational claims based on the data. All five hypotheses relied on variations of OLS regression to explore the predictive strength of the instructor

behaviors or ISR. However, the data were cross-sectional and collected simultaneously. Because of this, it becomes difficult to argue that any variables within the data set caused or predicted other variables with certainty because the temporal sequence is unclear (Wunsch, Russo, & Mouchart, 2010). For example, it is entirely possible that a student's enjoyable interactions with an instructor influence the extent to which they perceive use of related humor with their instructor rather than the reverse sequence from the current study. So, although the proposed sequences are rooted in theory, the limitations resulting from a cross-sectional design should be strongly considering when interpreting this study's analysis of predictors.

Third, using major assignment grades as a measure of cognitive learning has limitations. Major assignments may not capture all aspects of cognitive learning (Frisby et al., 2014). For example, student's recall of course material is a major component of cognitive learning. However, many course projects, papers, and assignments may not use recall of course material when grading; instead, these projects may rely more heavily on students' ability to apply course content, following directions, or understand a rubric. Further, a grade on a particular assignment may represent knowledge of a particular content area, but it may not equate to increased learning in the course's content as a whole (McCroskey & Richmond, 1992).

Fourth, model fit for study measures provided perhaps the most notable limitation of the current study. Four out of the five measures demonstrated varying issues with model fit when evaluated through CFAs. It is possible that the inadequate model fit was a result of nonnormal data; many model fit indices are negatively impacted when data are not normally distributed (Curran, West, & Finch, 1996). Regardless of the reason,

scholars have noted that the field of instructional communication needs to do a better job of continually evaluating the structural validity of both old and new scales (e.g., Kaufmann & Tatum, 2017). Future research should continue exploring the factor structure of this study's measures.

Given poor fitting models, modifying structural models in a post-hoc fashion to improve model fit is problematic. Adding post-hoc model respecifications, such as correlating item error terms, has the potential to mask an alternate, potentially more meaningful, structure (Gerbing & Anderson, 1984; Thurber et al., 2002). For this reason, scholars have called the practice both atheoretical and invalid (Hermida, 2015; MacCallum, Roznowski, & Necowitz, 1992). Although supported practices for model respecification were followed in the current study (Simon et al., 2010), results must be interpreted in light of the mixed support for these post-hoc alterations.

Removing items from structural models in a post-hoc fashion is similarly controversial. For example, item 6 of related humor ("My instructor facilitates student role-play exercises to illustrate course content") was removed based on the standardized estimate for the item's loading. Conceptually, the removal of this item makes sense; not all students may perceive role-play exercises as humorous. Some role-playing exercises may be serious and not funny, or students simply not view role-playing exercises in a humorous way (Stevens, 2015). Despite these logical reasons, removing this item could be seen as exploratory rather than confirmatory, going against the inherent purpose of CFA testing. As such, analyses including related humor must be interpreted in light of this item's omission.

Fifth, there were major issues in the measurement of perceived cognitive learning. After scrutinizing MIs and standardized item loadings to make modifications to the CLM's structural model, the modified three-factor model of the measure did not demonstrate evidence of model fit. This is surprising given that some previous research has reported acceptable model fit for the measure (Frisby et al., 2014). Past this, the retention and application dimensions were not reliable in the current sample and excluded from hypothesis testing, leaving the acquisition dimension as the only operationalization of perceived cognitive learning. As made clear by current conceptualizations of cognitive learning (Clark, 2002; Ellis, 2004; Frisby, Mansson, & Kaufmann, 2014; King & Witt, 2009), acquisition only captures a small portion of the larger latent construct. Thus, although analyses were still conducted using the acquisition dimension of the CLM, these results cannot be said to encapsulate the entirety of the concept of perceived cognitive learning and are severely limited in their generalizability.

Perhaps this evidence of poor factor structure is a result of the multiple reverse-coded items in the scale. While there are benefits to including reverse-coded items in scale construction (i.e., reducing or eliminating acquiescence bias), including such items has potential to lower overall model fit (Van Sonderen, Sanderman, & Coyne, 2013; Zhang, Noor, & Savalei, 2016). In practice, it makes sense that having participants jump back and forth between positively- and negatively-worded items could create mental confusion and lead participants to respond to the items without precision. In the case of the CLM, half of the items are reverse-coded with no pattern, so these negative effects could have a notable impact on the scale's factor structure. To explore this reasoning,

future research should explore the factor structure of this scale and inspect item loading for these reverse-coded statements.

5.3 Future Directions

The results of this study provide exigency for researchers to continue the exploration of ISR in future research. First, it is evident from this study's results and existing literature that a host of instructor behaviors work to influence ISR. However, for instructors and administrators hoping to better understand what particular behaviors are most effective for building rapport for the purposes of training, more needs to be understood about how the relative predictive strengths of these behaviors compare; there is utility in knowing which behaviors are most predictive of ISR. Using multiple regression techniques that include all hypothesized behaviors in a single model would help to prioritize the use of these behaviors.

Second, most existing research has explored ISR's relationship with prosocial instructor behaviors such as nonverbal immediacy (Frisby & Housley Gaffney, 2015), social support (Ryan, Wilson, & Pugh, 2011; Ryan & Wilson, 2014), or working alliance (Ryan & Wilson, 2014; Rogers, 2015). While some researchers have begun to explore how instructor characteristics and behaviors can diminish rapport (e.g., instructor verbal aggressiveness; Ryan et al., 2011), more should be done. For example, while the current study only explored prosocial forms of humor from Frymier, Wanzer, and Wojtaszczyk's (2008) study, antisocial humor may diminish the quality of the instructor-student relationship (Banas et al., 2011; Frymier et al., 2008; Wanzer et al., 2006). Inappropriate forms of humor in the classroom (i.e., other-disparaging and offensive) have potential to create social isolation or relational distance (M. Booth-Butterfield, S. Booth-Butterfield,

& Wanzer, 2007). These negative forms of humor also may create an uncomfortable learning context for students (Darling & Civikly, 1987; Stuart & Rosenfeld, 1994). Overall, students can see negative or inappropriate humor as contrary to the rapport built by a warm, immediate instructor, negatively affecting the perceived closeness of the relationship (Gorham & Christophel, 1990). Beyond humor, researchers might consider exploring the relationship among ISR and other antisocial instructor behaviors such as teacher misbehaviors (Goodboy & Myers, 2015; Kearney, Plax, Hays, & Ivey, 1991).

Third, more could be known about how ISR promotes a wider range of student engagement behaviors in the classroom (i.e., student willingness to participate in the learning process; Mazer. 2012). Researchers in both instructional communication and education have found that student engagement has close ties to academic achievement and learning (Gallagher, Marques, & Lopez, 2017; Kuh, Kinzie, Schuh, & Whitt, 2011) and is considered one of the best predictors of learning in instructional communication research (Frymier & Houser, 1999). In ISR research, participation - a form of student engagement - is one of the most commonly associated student outcomes with ISR (Frisby & Martin, 2010; Frisby et al., 2014; Frisby & Myers, 2008; Frisby et al., 2017). However, more needs to be known about additional student engagement behaviors that are related to ISR. For instance, Mazer (2012) forwarded a novel operationalization of student engagement that highlights a unique range of oral (e.g., asking questions, participating in discussions) and silent (e.g., taking notes, listening) behaviors indicative of student engagement inside (e.g., giving the teacher your full attention) and outside (e.g., preparing for class, talking about the course material with others) the classroom. Examining the relationship between Mazer's operationalization of student engagement

and ISR could better situate ISR within instructional communication research and make a stronger case for ISR's link to student engagement behaviors.

Fourth, given SDT's relatively poor utility in explaining the effects of ISR in the current study, additional theories need to be considered in order to answer Frisby and Buckner's (2018) call for additional theoretical frameworks for ISR. Another theory that may be useful for understanding ISR's role in the classroom is social cognitive theory (SCT). Bandura (1986) advanced SCT, describing human motivation, behavior, and well-being as a product of the dynamic interplay among personal (i.e., cognition, affect, biology), behavioral, and environmental influences. A fundamental concept in SCT is self-efficacy, or the belief about one's capabilities to learn or perform behaviors at particular levels (Bandura, 1977; Usher, 2015). Put simply, human decisions are driven by what people think they can do rather than what they actually can do (Bandura, 1997). These beliefs play a central role in regulating "the choices people make, the effort they put forth [, and] the persistence and perseverance they display in the face of difficulty when engaging in tasks on an everyday basis (Usher & Pajares, 2008, p. 751). By increasing students' perceptions of self-efficacy, ISR can promote a vast array of positive student outcomes in the classroom indirectly (see Pajares, 1996). Self-efficacy is generated, developed, and maintained through student interpretations of four sources, two of which may relate specifically to ISR (for review, see Usher & Pajares, 2008).

First, beliefs about self-efficacy are shaped, in part, by students' emotional and physiological states (e.g., mood, fatigue, stress). Physiological states students experience when engaging in or preparing for actions play a role in shaping their perceived capacities to perform future actions (Bandura, 1977). Reducing students' negative

emotional states and increasing their emotional and physiological well-being bolsters self-efficacy (Bandura, 1997). Studies have shown that ISR helps to increase positive affective states (e.g., confidence; Strage, 2000) and reduce negative affective states (e.g., anxiety; Frisby et al., 2014) for students. So, it seems likely that student perceptions of ISR could similarly influence students' emotional and physiological states as described by SCT, and subsequently, self-efficacy.

Second, verbal and social persuasions may also inform student perceptions of self-efficacy. Supportive, encouraging messages from parents, teachers, and peers may enhance students' confidence in their academic capabilities (Bandura, 1977). ISR could work to moderate the effects of instructor verbal and social persuasions. Verbal and social persuasions students receive from instructors, through a multitude of communication channels, can enhance students' confidence in their academic capabilities (i.e., self-efficacy). Further, it seems likely that the closer the perceived relationship is between an instructor and students, the more likely that verbal and social persuasions provided by instructors are integrated into a student's perception of personal capability. Humans tend to assign more weight to messages delivered by those they value and trust (e.g., Aldeis & Afifi, 2013). So, if a trusted instructor provides an affirming message to a student in the classroom, it could have a greater effect on self-efficacy than if a distant, cold instructor delivered it. Overall, there are many opportunities for future research to use SCT as a lens for understanding the positive influence of ISR in the instructional environment.

5.4 Conclusion

Understanding what motivates students in higher education will continue to be a priority for instructional communication researchers and educators, as the trend of students becoming increasingly disconnected and disenchanted with learning shows no signs of relenting (Hidi & Harackiewicz, 2000; Lazowski & Hulleman, 2016). Historically, instructional communication researchers have drawn significantly on the role of the instructor-student relationship for promoting student motivation, among other positive student outcomes, in the classroom. However, despite researchers continuing to explore these relationships (Mottet et al., 2006), Lane (2017) emphasized that as a field, we still have "much to learn about instructional communication from the relational perspective" (p. 120).

Frisby and other instructional researchers have produced impactful research that has deepened the field's understanding of the positive influence of ISR in the university classroom. This study adds to the growing literature on ISR by exploring behaviors that help cultivate ISR and how such rapport-building behaviors can be used as tools for instructors to help students confront this growing motivational deficit. In the end, ISR does more than just elicit positive course evaluations; it is an important component in creating a learning atmosphere for students to learn, grow, and succeed.

APPENDICES

APPENDIX 1. STUDY DESCRIPTION

Rapport, defined as an overall feeling between two people encompassing a mutual, trusting, and pro-social bond, has emerged as a popular relational construct in instructional communication literature, with growing evidence to suggest rapport-building is essential for promoting positive student behaviors, attitudes, communication, and ultimately, learning. The study seeks to further explore what instructor behaviors lead to rapport and how rapport affects student outcomes.

If you are at least 18 years old, are currently a college student, and are enrolled in a face-to-face course this semester, you can participate in our study. The participation time will be approximately 20 minutes.

*Please note: This study is also in the School of Information Science Research Subjects Pool. If you have already taken this survey for another class in the School of Information Science, you cannot receive credit for completing it in the Department of Communication Research Participation System.

<Insert Link Here>

APPENDIX 2. DIGITAL CONSENT

INSTRUCTOR-STUDENT RAPPORT AS A PSYCHOLOGICAL NEED FOR STUDENTS

We are asking you to choose whether or not to volunteer for a research study about the role on instructor-student rapport in the face-to-face classroom. This page is to give you key information to help you decide whether to participate. We have included detailed information after this page. Ask the research team questions. If you have questions later, the contact information for the research investigator in charge of the study is below.

WHAT IS THE STUDY ABOUT AND HOW LONG WILL IT LAST?

Rapport, defined as an overall feeling between two people encompassing a mutual, trusting, and pro-social bond, has emerged as a popular relational construct in instructional communication literature, with growing evidence to suggest rapport-building is essential for promoting positive student behaviors, attitudes, communication, and ultimately, learning. The study seeks to further explore what instructor behaviors lead to rapport and how rapport affects student outcomes.

To participate in this study, you will provide basic demographic information and reflect on a face-to-face course you are currently enrolled in using a series of survey items. Your participation in this research will last about 20 minutes.

WHAT ARE KEY REASONS YOU MIGHT CHOOSE TO VOLUNTEER FOR THIS STUDY?

Although you may not directly benefit from your participation, your responses may help university instructors better serve their future students.

WHAT ARE KEY REASONS YOU MIGHT CHOOSE NOT TO VOLUNTEER FOR THIS STUDY?

You may experience mild psychological discomfort when reflecting on a previous course. However, to the best of our knowledge, the things you will be asked have no more risk of harm than you would experience in everyday life. In addition to risks described in this consent, you may experience a previously unknown risk or side effect.

DO YOU HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any services, benefits, or rights you would normally have if you choose not to volunteer.

As a student, if you decide not to take part in this study, your choice will have no effect on your academic status or class grade(s).

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS OR CONCERNS?

The person in charge of this study is Nicholas Tatum of the University of Kentucky, College of Communication and Information. If you have questions, suggestions, or

concerns regarding this study or you want to withdraw from the study his/her contact information is: 325-674-2292, Nick.Tatum@acu.edu.

If you have any questions, suggestions or concerns about your rights as a volunteer in this research, contact staff in the University of Kentucky (UK) Office of Research Integrity (ORI) between the business hours of 8am and 5pm EST, Monday-Friday at 859-257-9428 or toll free at 1-866-400-9428.

DETAILED CONSENT:

ARE THERE REASONS WHY YOU WOULD NOT QUALIFY FOR THIS STUDY?

You do not qualify to participate in this study if you are under 18 years old, are not currently enrolled as a full-time student at a college or university, or are not currently enrolled in a face-to-face course at a college or university.

WHERE WILL THE STUDY TAKE PLACE AND WHAT IS THE TOTAL AMOUNT OF TIME INVOLVED?

The research procedures will be conducted via Qualtrics, an online survey system. Your participation in this research will last about 20 minutes.

WHAT WILL YOU BE ASKED TO DO?

To participate in this study, you will provide basic demographic information and reflect on a face-to-face course you are currently enrolled in using a series of survey items.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

You may experience mild psychological discomfort when reflecting on a previous course. However, to the best of our knowledge, the things you will be asked have no more risk of harm than you would experience in everyday life. In addition to risks described in this consent, you may experience a previously unknown risk or side effect.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

Although you may not directly benefit from your participation, your responses may help university instructors better serve their future students.

IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to take part in the study, you may complete an alternative research assignment to receive equivalent research credit for the CIS Research Subjects Pool (RSP).

If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST YOU TO PARTICIPATE?

There are no costs associated with taking part in this study.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

Information collected about you will be handled in a confidential manner in accordance with the law. Some identifiable data may have to be shared with individuals outside of the study team, such as members of the ACU Institutional Review Board. This study is anonymous. That means that no one, not even members of the research team, will know that the information you give came from you. Data will be stored on a personally-owned, password-protected laptop computer, but there will be no direct or identifying information relative to each participant.

We will make every effort to safeguard your data, but as with anything online, we cannot guarantee the security of data obtained via the Internet. Third-party applications used in this study may have Terms of Service and Privacy policies outside of the control of the University of Kentucky.

CAN YOU CHOOSE TO WITHDRAW FROM THE STUDY EARLY?

You can choose to leave the study at any time. You will not be treated differently if you decide to stop taking part in the study.

If you choose to leave the study early, data collected until that point will remain in the study database and may not be removed.

The investigators conducting the study may need to remove you from the study. This may occur for a number of reasons. You may be removed from the study if you are not able to follow the directions.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

Apart from earning 1 research credit for the CIS Research Subjects Pool (RSP), you will not receive any rewards or payment for taking part in the study.

WILL YOU BE GIVEN INDIVIDUAL RESULTS FROM THE RESEARCH TESTS/SURVEYS?

Generally, surveys done for research purposes are not meant to provide results that apply to you alone. Thus, you will not be provided with your individual results for this survey.

WHAT ELSE DO YOU NEED TO KNOW?

If you volunteer to take part in this study, you will be one of about 400 people to do so.

Nicholas Tatum is being guided in this research by Dr. Brandi Frisby. There may be other people on the research team assisting at different times during the study.

WILL YOUR INFORMATION BE USED FOR FUTURE RESEARCH?

Your information collected for this study will NOT be used or shared for future research studies, even if we remove the identifiable information like your name, clinical record number, or date of birth.

INFORMED CONSENT SIGNATURES

This consent includes the following:

- Key Information Page
- Detailed Consent

You are the subject or are authorized to act on behalf of the subject. Please click the button below if you voluntarily agree to participate in this study. Click only after you have read all of the information provided and your questions have been answered to your satisfaction. If you wish to have a copy of this consent form, you may print it now. You do not waive any legal rights by consenting to this study.

I voluntarily agree to participate in this study
I DO NOT voluntarily agree to participate in this study

APPENDIX 3. SURVEY

Demographics:

1. What is your gender? Male, Female, Other
2. What is your age? _____
3. What is your classification? Freshman, Sophomore, Junior, Senior
4. What is your major? _____
5. What is your race/ethnicity? American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, White.

Instructions:

Please recall the most recent, face-to-face college class you attended. Respond to each question in reference to that previous class and that previous instructor. Think of this same class and same instructor throughout the entire survey.

Instructor-Student Rapport:

Select the response option that best represents your perception of your relationship with your instructor on a scale from *strongly disagree* (1) *to strongly agree* (5).

6. In thinking about my relationship with my instructor, I enjoy interacting with him/her.
7. My instructor creates a feeling of "warmth" in our relationship.
8. My instructor relates well to me.
9. In thinking about our relationships, I have harmonious relationships with my instructor.
10. My instructor has a good sense of humor.
11. I am comfortable interacting with my instructor.
12. I feel like there is a "bond" between my instructor and me.
13. I look forward to seeing my instructor in class.
14. I strongly care about my instructor.
15. My instructor has taken a personal interest in me.
16. I have a close relationship with my instructor.

Prosocial Humor:

Select the response option that best represents the frequency with which your instructor exhibits the following humorous behaviors in the classroom on a scale from *never* (1) to *very often* (5).

My instructor…

17. Uses humor related to course material. (Related)
18. Uses funny props to illustrate a concept or as an example (Related)
19. Tells a joke related to course content. (Related)
20. Tells a humorous story related to course content. (Related)
21. Performs or acts out course material to illustrate concepts. (Related)
22. Facilitates student role-play exercises to illustrate course content. (Related)
23. Uses language in creative and funny ways to describe course material. (Related)
24. Tells stories unrelated to course content. (Unrelated)
25. Tells jokes unrelated to course content. (Unrelated)
26. Uses critical, cynical, or sarcastic humor about general topics (not related to the course). (Unrelated)

Confirmation:

Select the response option that best represents the frequency with which your instructor exhibits the following confirming behaviors in the classroom on a scale from on a scale from *strongly disagree* (1) *to strongly agree* (5).

My instructor:
27. Takes time to answer students' questions fully. (Responds to Questions)
28. Listens attentively when students ask questions or make comments during class. (Responds to Questions)
29. Indicates that he/she appreciates students' questions or comments. (Responds to Questions)
30. Is available for questions before and after class. (Responds to Questions)
31. Is willing to deviate slightly from the lecture when students ask questions. (Responds to Questions)
32. Communicates that he/she is interested in whether students are learning. (Demonstrated Interest)
33. Communicates that he/she believes students can do well in the class. (Demonstrated Interest)
34. Asks students how they think the class is going and/or how assignments are coming along. (Demonstrated Interest)
35. Makes an effort to get to know students. (Demonstrated Interest)
36. Smiles at the class. (Demonstrated Interest)
37. Uses an interactive teaching style. (Teaching Style)
38. Uses a variety of teaching techniques to help students understand course material. (Teaching Style)
39. Checks on students' understanding before going on to the next point. (Teaching Style)
40. Incorporates exercises into lectures when appropriate. (Teaching Style)
41. Gives oral or written feedback on students' work. (Teaching Style)

Intrinsic Motivation:

Select the response option that best represents your feelings of motivation for this course on a scale from *strongly disagree* (1) *to strongly agree* (5).

42. Learning new concepts in this class is fulfilling to me.
43. Developing my understanding of the content is rewarding to me.
44. Learning new things in this class makes me feel better about myself.
45. I find learning new things in this class to be unfulfilling.
46. Understanding new concepts in this class is enjoyable to me.
47. It is personally satisfying for me to learn new concepts in this class.
48. I get a sense of fulfillment when I learn new things in this class.
49. I do not enjoy trying to comprehend new ideas in this class.
50. Learning new things in this class makes me feel like I am growing as a person.
51. I desire to learn new things in this class because it gives me a sense of fulfillment.

Perceived Cognitive Learning:

Select the response option that best represents your perceptions of learning for this course on a scale from *strongly disagree* (1) *to strongly agree* (5).

52. I have learned a great deal in this class. (Acquisition)
53. I have learned more in other classes than in this class. (Acquisition)
54. My knowledge on this class topic has increased since the beginning of class. (Acquisition).
55. I have learned nothing in this class. (Acquisition)
56. I can see clear changes in my understanding of this topic. (Acquisition)
57. I did not understand what I learned in this class. (Acquisition)
58. I can clearly recall information from this class. (Recall)
59. I am unable to recall what I have learned in this class. (Recall)
60. I would be unable to use the information from this class. (Application)
61. I have learned information that I can apply. (Application)

Academic Performance:

While keeping this survey window open, use your UKY login and password to access your Canvas site for this course. Once in the course's Canvas website, navigate to the course's gradebook by clicking the "Grades" link on the left navigation bar. In the gradebook, identify your most recent project or exam (this should not be a daily grade or an assignment graded for completion). If your course does not use Canvas or a similar learning management system, please report this grade from memory.

62. What is the percentage grade for the assignment? (e.g., 86%)
    _____
63. What best describes the assignment you are reporting? Project Exam Other _____

Control Variables:

64. What is the instructor's gender? Male, Female, or Other
65. What is the size of the course? 0-20, 21-40, 41-60, 61-80, 81-100, 101+
66. What grade did you receive at midterms for this course? A, B, C, D, F
67. Prior to the start of this course, how would you described your relationship with your instructor on a scale from *very distant* (1) to *very close* (5)?
68. How many courses have you taken with this instructor prior to this course? _____
69. To what extent do you typically desire a relationship with your instructors in courses on a scale from *very undesired* (1) to *very desired* (5)?

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VITA

Nicholas T. Tatum

EDUCATION

Ph.D., University of Kentucky (Expected Fall 2019)
Communication Studies – College of Communication and Information
Primary Area: Instructional Communication
Dissertation: "Instructor-Student Rapport as a Psychological Need for Students"
Advisor: Dr. Brandi Frisby
Committee: Drs. Derek Lane, Renee Kaufmann, & Ellen Usher
Instructional Communication Graduate Certificate
Interpersonal Communication Research Fellow

M.A., Abilene Christian University (May 2015)
Communication Studies – College of Arts and Sciences
Thesis: "The Impact of Transformational Instructor Leadership on Student Engagement in the University Classroom"
Thesis Chair: Dr. Carley Dodd

B.A., Abilene Christian University (May 2013)
Family Studies, Ministry – College of Arts and Sciences
Presidential Scholar
Summa Cum Laude

ACADEMIC APPOINTMENTS

Assistant Professor (Fall 2019 - Present)
Abilene Christian University
Department of Communication and Sociology

Instructor (Fall 2017 - Spring 2019)
Abilene Christian University
Department of Communication and Sociology

Graduate Teaching Assistant (Fall 2015 - Fall 2017)
University of Kentucky
College of Communication and Information

Graduate Teaching Assistant (Fall 2013 - Spring 2015)
Abilene Christian University
Department of Communication and Sociology

SCHOLARLY PRODUCTIVITY

Refereed Articles

Frisby, B. N, Sidelinger, R., & **Tatum, N. T.** (2019). Alumni recollections of interactions with instructors and current organizational identification, commitment, and support of the university. *Communication Reports, 32, 161-172*. https://doi.org/10.1080/08934215.2019.1636107

Sidelinger, R., & **Tatum, N. T.** (2019). Instructor humor as a moderator of instructors' inappropriate conversations and instructional dissent. *College Teaching, 67,* 120-129.

Dragojevic, M., **Tatum, N. T.**, Beck, A. C., & McAninch, K. (2018). Effects of accent strength expectancy violations on language attitudes. *Communication Studies*, *70*, 133-150.

Kaufmann, R. & **Tatum, N. T.** (2018). Examining direct and indirect effects of classroom procedural justice on online students' willingness to talk. *Distance Education, 39*(3), 373-389.

Tatum, N. T., & Frey, T. K. (2018) Students as consumers: User responses to money-back guarantees in higher education on Reddit. *The Online Journal of Distance Education and e-Learning, 6*(3), 44-51.

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Tatum, N. T., Hoffman, H., Slone, A., & Hadden, A. (2017). Let the good times roll: Using loaded dice to introduce descriptive and inferential statistics. *Carolinas Communication Annual, XXXIII*, 83-88.

Kaufmann, R., & **Tatum, N. T.** (2017). Do we know what we think we know? On the importance of replication in instructional communication research. *Communication Education*, *66*, 479-481.

Dragojevic, M., Giles, H., Beck, A. C., & **Tatum, N. T.** (2017). Foreign accent strength, processing fluency, and group prototypicality: Implications for language attitudes. *Communication Monographs*, *84*,

Frey, T. K., & **Tatum, N. T.** (2017). The influence of classroom cell phone policies on instructor credibility. *Journal of the Communication, Speech, and Theatre Association of North Dakota, 29,* 1-13.

Frey, T. K., & **Tatum, N. T.** (2016). Hoverboards and "hovermoms": Helicopter parents and their influence on Millennial students' rapport with instructors. *Communication Education*, *65*, 359-361.

Book Chapters

Tatum, N. T. (Accepted). Cognitive learning measure. In E. E. Graham & J. P. Mazer (Eds.), *Communication research measures III: A sourcebook*. New York: Routledge.

Tatum, N. T. (Accepted). Modified rapport measure. In E. E. Graham & J. P. Mazer (Eds.), *Communication research measures III: A sourcebook*. New York: Routledge.

Tatum, N. T. (Accepted). Student communication satisfaction scale. In E. E. Graham & J. P. Mazer (Eds.), *Communication research measures III: A sourcebook*. New York: Routledge.

Tatum, N. T. (Accepted). Instructional dissent scale. In E. E. Graham & J. P. Mazer (Eds.), *Communication research measures III: A sourcebook*. New York: Routledge.

Tatum, N. T. (Accepted). Student engagement scale. In E. E. Graham & J. P. Mazer (Eds.), *Communication research measures III: A sourcebook*. New York: Routledge.

Tatum, N. T. (Accepted). Student interest scale. In E. E. Graham & J. P. Mazer (Eds.), *Communication research measures III: A sourcebook*. New York: Routledge.

Lane, D. L., Frey, T. K, & **Tatum, N. T.** (2017). Affective approaches and methods. In M. L. Houser and A. M. Hosek (Eds.), *The handbook of instructional communication: Rhetorical and relational perspectives (2nd ed.)*. New York: Taylor & Francis.

Kaufmann, R., **Tatum, N. T.**, & Frey, T. K. (2017). Current tools and trends of new media, digital pedagogy, and instructional technology. In M. G. Strawser (Ed.),

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Tatum, N. T., & Beck, A. C. (2017). Apples to apples: Connecting disconnected ideas. In J. S. Seiter, J. Peeples, & M. L. Sanders (Eds.), *Communication in the Classroom: A Collection of G.I.F.T.S.* Boston, MA: Bedford/St. Martin's.

Frey, T. K., **Tatum, N. T.**, & Beck, A. C. (2017). Is it really JUST Twitter!?: Agenda setting in social media. In J. S. Seiter, J. Peeples, & M. L. Sanders (Eds.), *Communication in the Classroom: A Collection of G.I.F.T.S.* Boston, MA: Bedford/St. Martin's.

Tatum, N. T., & Frey, T. K. (2017). Be the change: Cardboard confessionals. In K. Rudick, K. Golsan, and K. Cheesewright (Eds.), *Teaching from the heart: Critical communication pedagogy in the communication classroom*. San Diego, CA: Congella Inc.

AWARDS AND RECOGNITION

Unsung Hero Award (2019)
University-wide faculty/staff award, *Abilene Christian University*

Rising Star Award in Training and Development (2018)
Training and Development Division, *National Communication Association*

Top Paper Awards
Top 4 Paper Panel - Communication Theory Interest Group, *CSCA '19*
Top Overall Paper - Communication Education Interest Group, *CSCA '19*
Top Overall Paper - Basic Course Interest Group, *CSCA '19*
Top Student Paper Panel - Communication Education Interest Group, *CSCA '18*
Top Student Paper - Human Communication & Technology Division, *NCA '17*
Top 4 Student Paper Panel - Communication and the Future Division, *NCA '17*
Top Student Paper - Instructional Development Division, *SSCA* '17
Top Overall/Student Paper - Communication Education Division, *CSCA* '17
Top 4 Paper Panel - Communication Education Division, *CSCA* '17
Top Overall/Student Paper - Training and Development Division, *NCA* '16
Top Overall/Student Paper - Instructional Development Division, *NCA* '16
Top 3 Student Paper Panel - Basic Course Division, *NCA* '16
Top G.I.F.T.S. Idea - Community College Interest Group, *ECA* '16

Graduate Teaching Excellence Award (2016 - 2017)
College of Communication and Information, *University of Kentucky*

Outstanding Scholarship in Instructional Communication (2016 - 2017)
Communication Graduate Student Association, *University of Kentucky*

Outstanding Service to the Communication Discipline (2016 - 2017)
Communication Graduate Student Association, *University of Kentucky*

Outstanding Manuscript Award (2016)
Top Published Manuscript for Central Region, *Central States Communication Association*

Graduate Student Fellow (2016)
Presentation U!, *University of Kentucky*

Graduate Teaching Assistant of the Year (2014 - 2015)
Communication and Sociology Department, *Abilene Christian University*

Outstanding Graduate Assistant of the Year (2013 - 2014)
Communication and Sociology Department, *Abilene Christian University*