GROWTH MODEL FOR STUDENTS' PERCEPTIONS OF TEACHERS IN MIDDLE AND

HIGH SCHOOL

by

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A DISSERTATION

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DISSERTATION ABSTRACT

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Title: Growth Model for Students' Perceptions of Teachers in Middle and High School

The purpose of this study was to model students' perceptions of teachers (fair, warm, friendly, etc.) over time from 6th to 9th grade, to examine whether a relationship existed between students' perceptions of teachers and distal outcomes of education attainment and education status in emerging adulthood, and to examine whether gender was associated with teacher perceptions, the trajectory of perceptions, or the outcomes. Attachment Theory and Self Determination Theory were used as frameworks for understanding relationships between study variables.

The present study used existing data from a longitudinal, multi-wave, intervention study (Project Alliance 2 [PAL-2] DA018374) that addressed adolescents' negative behaviors during middle school to high school. Data was examined from a sample of 415 participants from the larger randomized control trial of 593. Participants were students from three socioeconomically and ethnically diverse public middle schools in the Pacific Northwest. Data was analyzed using Mplus7.1 using full information maximum likelihood to account for missing data.

The study had several key findings. First, latent class growth model (LCGM) analyses revealed a significant a linear model that showed an overall declining trajectory of students' perceptions of teachers from 6th to 9th grade. There was a significant difference between

students' perceptions of teachers in 6th grade and education status. Students who reported more positive perceptions of teachers in 6th grade were more likely to endorse enrollment in a vocational or educational program. Second, LCGM analyses further revealed a model with an added quadratic term that showed an overall declining trajectory of student's perceptions of teachers that decelerated beginning at 7th grade. Third, LCGM and growth mixture model analyses examined trajectories of students' perceptions of teachers over time and revealed a two-class model. The first class was represented by a declining trajectory and a second class represented by overall lower students' positive perceptions of teachers in 6th grade that increase each year through the 9th grade. Students' perceptions of teachers appear to converge in 9th grade for both classes. Implications for practice and research, along with limitations and directions for future research are discussed.

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CHAPTER I

INTRODUCTION

The middle school years serve as a critical time period in students' educational and vocational development. Evidence suggests there are normative declines in students' school motivation and performance during early adolescence (i.e. ages 10-14; Eccles, 2008). These declines occur across dimensions of student engagement, including students' interest in and feelings of belonging in school (Connell & Klem, 2000; Dweck, 2002; Gottfried et al., 2001). Levels of school engagement, defined as level of students' involvement, attachment and commitment to academic and social activities in school, remain low during high school (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). That is, engagement levels tend to be lower for students in middle and high school compared to students in elementary and tertiary schools (Martin, 2009). Approximately half of students exhibit chronically lower levels of school engagement when entering high school (Klem & Connell, 2004). School engagement is positively associated with adolescents' feelings of school belonging, educational aspirations (Li & Lerner, 2013; Wang & Eccles, 2012) and negatively associated with student high school dropout rates (Archambault, Janosz, Morizot, & Pagani, 2009).

Teachers are a key factor in students' experience of school. Declines in students' motivation, academic performance, and school engagement may be mitigated by students' perceptions of teachers. Teachers' behaviors influence classroom learning environments and promote students' academic achievement (Daniels & Shumow, 2003; Liew, Chen & Hughes, 2010). Students who experience their teachers as both warm and empathic have better cognitive outcomes, such as increased creative thinking and math

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and verbal achievement, and behavioral outcomes, such as increased student satisfaction, lower likelihood of drop-out, increased self-efficacy/mental health, increased positive motivation and increased social connection/skills (Cornelius-White, 2007). Additionally, Teachers play a role in fostering a positive school climate (Thapa et al., 2013) which is associated with student learning and achievement (MacNeil, Prater & Busch, 2009).

Students' experiences in middle school may play a larger role in future outcomes than previously established through studies of singular locations and time points (i.e., cross-sectional research focused on classrooms, school, or home-life).

This study models students' perceptions of teachers over time from 6th to 9th grade, and explores whether there are differences in trajectories based on postsecondary outcomes in emerging adulthood. First, I provide justification for focusing on middle school experiences to predict postsecondary outcomes. Second, I introduce research on students' perceptions of teachers and postsecondary outcomes such as education attainment (i.e., graduating high school and going to college). Third, I provide a theoretical framework to support the model. Finally, this chapter concludes with a description of the purpose of the study, associated research questions, and model tested.

Middle School as Critical Time Period

Early adolescence is a critical time period for examining students' behaviors in relation to future outcomes. Research on college and career readiness predominantly focuses on high school years; however, to maximize college and career readiness, greater focus on upper elementary and middle school students is recommended (ACT, 2008; ACT, 2014). Students form plans to attend college as early as middle school (Pedro, Baker, Bowers & Heffernan, 2013). Students who make plans for postsecondary

education while they are in middle school have an increased likelihood of attending college (Cabrera, La Nasa, & Burkum, 2001). Those who do not plan for postsecondary education during middle school may become disengaged from school, increasing later risk of being disinterested in pursuing post-secondary education and/or dropping out (Balfanz, Herzog, & Mac Iver, 2007).

Student behaviors during late elementary and middle school likely contribute to academic readiness for college and careers (Balfanz, 2009). These behaviors include academic discipline (i.e., good work and study habits; ACT, 2008; ACT, 2014) and other academically-related psychosocial behaviors such as motivation, social connectedness, school attendance, rule adherence, drug avoidance and positive relationships with school personnel (Balfanz, 2009; Casillas, Robbins, & Schmeiser, 2007; Jones & Byrnes, 2006; Kaufman & Bradbury, 1992; Rumberger, 1995; Worrell & Hale, 2001). Students exhibiting these positive behaviors during middle school are more likely to experience positive academic outcomes during high school. These experiences, in turn, contribute to college and career readiness (ACT, 2008; ACT, 2014; Balfanz, 2009).

In addition to understanding the behaviors benefiting students' career and college readiness during middle school, it is important to identify behaviors hindering career and college readiness. Administrators and school personnel can target students who are at risk for dropping out of school with resources as part of a proactive intervention strategy, thereby working towards increasing college and career readiness (Balfanz, 2009). Students at risk for dropping out can be identified in 6th grade (Balfanz, Herzog, & Mac Iver, 2007; Neild, Balfanz, & Herzog, 2007). Results of a longitudinal study on students from 6th to 12th grade were used to develop an early warning system for identifying

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students who drop out of high school (Balfanz et al., 2007; Neild et al., 2007). The system contained five key indicators in Grade 6, including: (a) attending school 80% or less of the time, (b) having a failing grade in Math, (c) having a failing grade in English, (d) receiving an out-of-school suspension, and (e) receiving a final unsatisfactory behavior mark in any subject (Balfanz et al., 2007; Neild et al., 2007). These findings highlight the link between 6th grade outcomes and longer term outcomes.

Further research is warranted to both understand specific factors that influence the development of positive academic and psychosocial behaviors for students in middle school and to inform the development of middle school interventions that enhance college and career preparedness. Given the importance of teachers as key figures in students' experience of middle school, I next focus on literature describing relationships between select teacher variables and student outcomes. First, I review literature on perceptions of teachers, followed by information about perceptions of teacher support and the teacher-student relationship.

Literature Review Parameters

For the following literature review, I used Google Scholar and PsycNET linked to my university library search engine. With Google Scholar I used the following parameters: articles from peer-reviewed journals, published in English language journals and published in the last 7 years. I began my search by using population specific terms: middle school perceptions of teachers ($n = 23,400$), early adolescence perceptions of teachers ($n = 17,400$), teacher-student relationships in middle school ($n = 17,900$), and perceptions of teacher support middle school ($n = 20,400$). Next, I used more broad search terms including: student perceptions of teachers ($n = 302,000$), teacher-student

relationships (n = 19,500), and perceptions of teacher support (n = 319,000). The results of this review of literature provided a total of 719,600 articles in the search.

Not all of the search results were relevant for my population of interest or specific research questions, for example, I eliminated studies that focused on college students or examined solely parents' perceptions of teachers. I then focused my review on articles that were most relevant for this study. The articles I chose as most relevant were articles with research questions similar to those of the present study. For example, I included studies that focused on early adolescents, examined student outcomes related to teacher variables and/ or examined the relationship between students and teachers longitudinally. I selected these relevant articles from the original set and used the "cited by" function to identify addition research articles on my topic. Within the "cited by" articles, I searched key terms to find studies focused on my population of interest. Specifically, I used the key terms "middle school" or "early adolescence." I also expanded my time frame in the search engine to 2005 to include key relevant articles, and made exceptions for older articles that were frequently cited and that provided foundational information.

I used PsycNET to search for articles from peer reviewed journals and published in English language journals. My PsycNET search also included articles from PsycINFO. The following represents the total articles that resulted from my search in PsycNET and PsycINFO. First are the population specific terms: middle school perceptions of teachers (n = 939), early adolescence perceptions of teachers (n = 134), teacher-student relationships in middle school (n = 177), and perceptions of teacher support middle school (n = 212). Next, the broad search terms including: student perceptions of teachers (n = 3,783) teacher-student relationships (n = 1,400), and

perceptions of teacher support (n = 1,349). The results of this review of literature

provided a total of 7,994 articles in the search.

Similar to my Google Scholar search, not all of the search results were relevant

for my population of interest or specific research questions. I focused my review on

articles that examined similar questions to my study or focused on my population of

interest. Overall, in order for articles to be included in this review, the following criteria

had to be met: (a) focus on students' perceptions of teachers or focus on student/teacher

relationships, (b) focus on students' perceptions of teacher support, and (d) focus on

middle school students/ early adolescents.

Teacher Relationships

Adolescents spend a large portion of each weekday, approximately 6-8 hours a

day, in school contexts. As such, the quality of the school climate is important.

According to the National School Climate Council (2007), school climate is "the quality

and character of school life [based on] patterns of school life experiences and reflect

norms, goals, values, interpersonal relationships, teaching, learning and leadership

practices, and organizational structures" (p. 5). School climate is positively associated

with academic performance and engagement (MacNeil, Prater & Busch, 2009). Teachers

serve an important role in fostering a positive school climate (Thapa et al, 2013).

Teacher and classmate relationships are an important influence on the

socioemotional and academic development of adolescents (Eccles & Roeser, 2003;

Pianta, Hamre, & Allen, 2012). Students' sense of connectedness to teachers and peers in

school is positively correlated with academic motivation and engagement (e.g., Wang &

Eccles, 2013; Wang & Holcombe, 2010). Teachers and classmates influence problem

behaviors, emotional problems, academic adjustments, and school engagement (e.g., Estell, & Perdue, 2013; Rueger, Malecki, & Demaray, 2010; Stewart, & Suldo, 2011). Positive and supportive teachers provide a low conflict learning environment that promotes academic achievement for students who experience self-regulation difficulties (Liew, Chen & Hughes, 2010). The following review of the literature highlights the relationship between students' perceptions of teachers and students' academic achievement.

The primary role of teachers is instruction. In addition to their role as instructors, teachers serve as motivators for their students (Brekelmans, Levy, & Rodriguez, 1993; Stroet, Opdenakker, & Minnaert, 2013; Wentzel, Battle, Russell, & Looney, 2010). Teachers' communication and interpersonal skills influence classroom environments. These skills, in turn, influence students' efforts on learning tasks and school engagement (Daniels & Shumow, 2003).

Cornelius-White (2007) conducted a meta-analysis examining the relationship between person-centered teacher variables (i.e. affective and instructional) and student outcomes (i.e. affective or behavioral and cognitive). The studies in the meta-analysis included students from pre-K through age 20; however, the majority of students in these studies were in $1^{st} - 12^{th}$ grade. The person-centered teacher variables included: empathy, warmth, genuineness, nondirectivity, higher order thinking, encouraging learning/ challenge, adapting to individual and social differences. The person-centered variables that had the strongest correlations with positive student outcomes were nondirectivity, empathy, warmth and encouragement of higher order thinking.

The affective or behavioral student outcomes measured in the Cornelius-White (2007) study included: student participation/initiation, positive motivation, self-esteem/ mental health, social connection, attendance/absences, global satisfaction, disruptive behavior, negative motivation, and drop-out prevention. The cognitive student outcomes included: achievement batteries, grade/retention, perceived achievement, verbal achievement, math, science, social science, IQ, and creative/critical thinking. The findings of the meta-analysis support the conclusion that teachers' behaviors and qualities impact student outcomes. For example, Cornelius-White (2007) found that a composite score of person-centered teacher variables was positively correlated with affective or behavioral outcomes related to participation, student satisfaction, drop-out prevention, self-efficacy/mental health, positive motivation and social connection/ skills, as well as cognitive outcomes related to critical/creative thinking, and math and verbal achievement. Findings subsequent to this meta-analysis (e.g. Cohen & Geier, 2010, Roorda, Koomen, Spilt, & Oort, 2011) have come to similar conclusions about the importance of person-centered teacher variables on student outcomes.

Much of the current research on teacher relationships is focused on examining the overall teacher-student relationship, perceptions of teacher support, and related short term associations (e.g., academic outcomes). However, it is important to further understand longer term outcomes associated with perceptions of teachers. The present study follows students throughout middle school and in their transition to high school. Findings from research on the teacher-student relationship and perceptions of teachers' support provide more information about students' overall perceptions of teachers on affective person-centered variables and related postsecondary outcomes. Research on the teacher-student

relationship highlights the association between a positive teacher-student relationships and positive academic outcomes (Pianta, Steinberg, & Rollins, 1995; Roorda, Koomen, Spilt, & Oort, 2011). Additionally, research on perceptions of teacher support highlights the association of different types of support (emotional and instructional) and positive academic outcomes (Federick & Skaalvik, 2014; Tennant et al., 2015). Overall, to better understand the relationship between students' perception of teachers specific to affective person-centered teacher variables and associated postsecondary outcomes, next I review findings on outcomes associated with teacher-student relationships, followed by a review of key findings associated with perceptions of teacher support.

Teacher-student relationship quality shapes students' experience of their academic environment and positively influences student engagement. Positive teacher-student relationships, defined as "warm, close, communicative," are associated with behavioral competencies and school adjustment (Pianta, Steinberg, & Rollins, 1995; Roorda, Koomen, Spilt, & Oort, 2011). Positive teacher-student relationships are associated with engagement and achievement, while negative teacher-student relationships are associated with lower levels of engagement and achievement and increase in conduct problems (Bergin & Bergin, 2009; Davis, 2003; Hamre & Pianta, 2001; Longobardi, Prino, Marengo & Settanni, 2016; Pianta et al., 2003; Roorda, Koomen, Spilt, & Oort, 2011; Skinner & Belmont, 1993). Furthermore, in a sample of 7th and 8th grade students in Germany, students' perception of the teacher-student relationship was positively associated with intrinsic motivation and academic self-regulation (Raufelder, Scherber, & Wood, 2016).

Students' gender is associated with teacher-student relationships. Teachers perceived higher levels of conflict and lower levels of closeness with boys than with girls from preschool through middle school (Hajovsky, Mason, & McCune, 2017; Hamre & Pianta, 2001; Jerome et al., 2009; O'Connor, 2010; Saft & Pianta, 2001). Wu et al. (2010) conducted a longitudinal study that examined the teacher-student relationship quality type in elementary grades. Teacher-student relationship quality was measured using both child and teacher ratings for students in two grade cohorts, 2nd and 3rd respectively (Wu, Hughes, & Kwok, 2010). First, a cluster analysis was conducted to examine different types of teacher-student relationships, using reports from teachers and children on support and conflict, and peers on support (Wu et al., 2010). The cluster analysis yielded a four-cluster solution: (1) Congruent Positive (n = 279), consensually high ratings of teacher-student support and low rates of teacher-student conflict; (2) Congruent Negative (n = 70), consensually low ratings of teacher-student support and high rates of conflict; (3) Incongruent Child Positive (n = 165), the child reports average to high ratings of support and low rates of conflict but teachers and peers report low teacher support and high conflict; (4) Incongruent Child Negative (n = 195), the child reports low rates of support but teachers and peers report average to high ratings of support and average to low ratings of conflict (Wu et al., 2010). The researchers concluded in this study that girls were more likely to be in the Congruent Positive group and less likely to be in any of the other groups. That is, girls were more likely to perceive higher levels of support and lower levels of conflict (Wu et al., 2010).

In the second part of this study, Wu et al. (2010), examined differences between these four groups with respect to engagement and achievement trajectories. Participants

in the groups with positive other (i.e., teacher and peers) ratings of the teacher-student relationship, were more engaged and had higher achievement in math and reading over the next three years compared to participants who had low other (teacher and peers) ratings of the teacher-student relationship (Wu et al., 2010). Finally, demographic differences among the groups on engagement and achievement trajectories were measured. Unlike the gender differences that were present when examining the relationship between student gender and teacher-student relationship, gender differences were not present when examining the relationship between student gender and engagement and achievement over time (Wu et al., 2010). Overall, findings from the Wu et al. (2010) study support short-term academic and engagement benefits for students with positive teacher-student relationships.

In a longitudinal study of teacher-student relationships from preschool through 3rd grade, researchers found positive associations between the quality of the teacher-child relationship and students' achievement and classroom engagement (O'Connor & McCartney, 2007). Relationship quality was assessed by teachers. The teachers completed a 15-item subscale of the Student Teacher Relationship Scale (STRS) at 54-months, kindergarten, 1st and 3rd grade. Teacher-child relationships were stronger predictors of achievement for children in 3rd grade than peer and insecure maternal attachments. In the same study, researchers found a slight decrease in average quality of relationships over time, possibly a result of increasing emphasis on instructional vs. relational interactions as grade level rises (O'Connor & McCartney, 2007). The researchers also identified three trajectories of change using cluster analysis: (a) a stable-moderate (no significant change), (b) declining low (decreased relationship quality with a

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low relationship quality by 3rd grade), and (c) inclining high quality of relationships (minimal increase over time with a high relationship quality by 3rd grade), with most children (62%) demonstrating increases in relationship quality (O'Connor & McCartney, 2007). The children in the declining low trajectory had the lowest achievement scores relative to children in the stable-moderate and inclining-high trajectories. The findings further support positive associations between the quality of the teacher-child relationship and achievement.

Overall, the teacher-student or teacher-child relationship is associated with achievement. However, there are mixed findings on the extent to which a decline in the quality of teacher-student relationship is also evident over time. In the study by O'Conner and McCartney (2007), initial findings suggested a decrease over time in the quality of teacher-student relationships, but after further analyses revealed several different trends in the sample, with a positive trend in relationship quality present in the majority of participants. The study by O'Conner and McCartney (2007) highlights the benefits of examining teacher-student relationships over time and attending to different patterns over time. Given the importance of students' perceptions of their teachers for a variety of outcomes, further research focused on middle school students' perceptions of teachers as they transition to high school is warranted. Next, to continue to understand the association between affective person-centered perceptions of teacher variables and students' outcomes, I review of key findings associated with perceptions of teacher support.

Perceptions of teacher support are closely related to the teacher-student relationship. However, while the teacher-student relationship quality is typically

measured using variables that capture both conflict and support, teacher support is focused on variables that measure different types of support (e.g. emotional, instrumental). There are many definitions and measures of teacher support. Tardy (1985) described social support using a five dimensional model that included: direction (received or provided), disposition (available or enacted), description/evaluation (support described or evaluated by person), network (source), and content (emotional, instrumental, informational and appraisal). Furthermore, assessment of teacher support varies across studies, with some studies assessing across all teachers and other studies focusing on an individual teacher. Additionally, some studies focus on multiple types of support, such as emotional support, instrumental support, appraisal support and informational supports (i.e. Klem & Connell, 2004; Tennant et al., 2015), while other studies focus on a single type of support such as emotional support (i.e. De Wit, Karioja, Rye & Shain, 2011).

Across all of these varied definitions and measures, there is consistent evidence that perception of teacher support decreases over time, and especially during the transition from primary to secondary school (Bokhorst, Sumter, & Westenberg, 2010; De Wit, Karioja, Rye, & Shain, 2011; Demaray & Malecki, 2002; Reddy, Rhodes, & Mulhall, 2003). Perceptions of teacher support may be more important for students in primary and middle school, as peers and parents are more likely than teachers to serve as sources of support for students in high school (Wentzel, Battle, Russell, & Looney, 2010). Perceived teacher support is stronger for students in middle school than elementary school (Klem & Connell, 2004). In a sample of 7th and 8th grade students, perceived teacher emotional support was positively associated with academic outcomes,

such as GPA (Tennant et al., 2015). Overall, research supports positive associations

between student perceptions of teacher support and academic outcomes (i.e. GPA),

school engagement, and career preparation (Perry, Liu, & Pabian, 2010). Table 1

provides more details about the measurement of teacher support for each of these studies.

Table 1
Measurement of Teacher Support

Article	Measure	Subscale	Validity
De Wit, Karioja, Rye, & Shain, 2011	Social Support Appraisals Scale of the Survey of Children's Social Support (SSAS; Dubow & Ullman, 1989)	5-item Teacher Support subscale	$\alpha = .71-.73$
Klem & Connell, 2004	Research Assessment Package For Schools- Student Version (RAPS-S; Bridges & Connell, 1998)	Experiences of Teacher Support: 10-items subscale for elementary students 14-items subscale for secondary students	$\alpha = .80$ (elementary) $\alpha = .82$ (secondary)
Demaray & Malecki, 2002	Child and Adolescent Social Support Scale (CASSS; Malecki et al., 2000)	12-item Perceived Social Support From Teachers subscale	$\alpha = .96$
Metheny, McWhirter, & O'Neil, 2008	Teacher Support Scale (TSS; McWhirter, 1996)	27-item measure of student perceptions of teacher support	$\alpha = .97$
Perry, Liu, & Pabian, 2010	Teacher Support Scale (TSS; McWhirter, 1996)	21-items based on 27-item scale used	$\alpha = .94$
Reddy, Rhodes, & Mulhall, 2003	Revised Classroom Environment Scale (CES; Trickett & Moos, 1973)	6-item Teacher Support Subscale (shortened)	$\alpha = .74-.79$

Tennant et al., 2015	Child and Adolescent Social Support Scale (CASSS; Malecki et al., 2000).	12-item Teacher Support Subscale	α = .72-77 (Teacher Frequency)
			α = .65-71 (Teacher Importance)
Wentzel, Battle, Russell, & Looney, 2010	Classroom Life Measure (Johnson, Johnson, Buckman & Richards, 1985)	3-item from item Teacher Social Support subscale	α = .86

Another measure that captures teacher support is the Classroom Emotional Climate (CEC) which assesses the quality of social and emotional interactions between and among students and teachers in a classroom (Daniels & Shumow, 2003). The CEC is not included in Table 1 because it measures the influence of teacher support on students' school engagement indirectly through the examination of the classroom environment (Daniels & Shumow, 2003). High CEC refers to a classroom characterized by the following: (a) teachers who attend to students' needs; (b) a warm, caring, nurturing, and friendly relationship between teachers and students; (c) teachers who place importance on their students' perspectives; and (d) teachers who do not engage in harsh disciplinary practices or sarcastic behaviors. There is a positive association between level of CEC, grades, and school engagement for students in 5th and 6th grade (Reyes et al., 2012). Additionally, school settings characterized by supportive relationships, emotional and physical safety, and shared learning goals are associated with greater school connectedness and academic success (Cohen & Geier, 2010).

The type of support that students perceive also influences academic outcomes. Federici & Skaalvik (2014) examined the relationship between perceived emotional and instrumental support for students in 9th and 10th grade, their mathematic teachers, intrinsic

motivation, help-seeking behavior, effort, and math anxiety. Emotional support refers to

students' perceptions of trust, warmth, respect and is related to students' sense of

connectedness (Johnson, 2009; Libbey, 2004; Patrick, Kaplan, & Ryan, 2011).

Instrumental support refers to students' perceptions of teachers providing practical

support such as clarifying, correcting, and elaborating content (Malecki & Demaray,

2003). Students' perceptions of instrumental support were negatively and directly related

to math anxiety, and positively and directly related to intrinsic motivation, effort, and

help seeking behavior (Federick & Skaalvik, 2014). Students' perceptions of emotional

support were positively and directly related to intrinsic motivation and help seeking

behavior, however, the relationship between instrumental support and all outcomes

measured was stronger than those with emotional support. Overall, secondary school

students in the Federici & Skaalvik study (2014) appeared to benefit most from

instrumental support.

A longitudinal study of elementary and middle school students established

thresholds to identify optimal and risk levels of student engagement (Klem & Connell,

2004). The thresholds were established by identifying the level of engagement leading to

strong and poor performance on a standardized measure of achievement, respectively.

Elementary school students reporting high levels of teacher support were more likely to

have an optimal level of engagement compared to students with typical levels of support.

Middle school students reporting high levels of teacher support also were more likely to

have an optimal level of engagement and the effect was stronger for students in middle

school than elementary school. Specifically, middle school students who reported high

levels of teacher support were almost three times more likely to have optimal levels of

engagement compared to elementary school students. One major conclusion from this study was that perceived teacher support appears to have a strong positive influence on engagement, which in turn influences academic outcomes (Klem & Connell. 2004). Students who perceive support at school may be more successful in navigating school expectations (Klem & Connell, 2004). However, the study did not examine bi-directional influences. As such, it is also possible that levels of perceived teacher support could have been influenced by student engagement (Klem & Connell, 2004).

There are mixed findings regarding whether students' gender is associated with perceptions of teacher support. In a cross-sectional study of students in 6th to 8th grade, researchers found no significant difference in mean ratings of perceived teacher support by gender (Rueger, Malecki, & Demaray, 2010). Conversely, in a cross-sectional study of 9-18 year olds, girls were more likely to perceive teachers as supportive than boys (Bokhorst, Sumter, & Westenberg, 2010). Furthermore, in a cross-sectional study of students in 7th and 8th grade which examined gender differences in different types of perceived teacher support and associated outcomes, there was a positive association between girls' perceptions of teacher support and academic outcomes, but not for boys (Tennant et al., 2015). In the same study, girls rated emotional and appraisal support as more important relative to boys' ratings.

Overall, research findings provide evidence for the influence of students' perceptions of teachers on achievement and engagement, with a stronger effect during middle school. In addition, research findings associations between students' gender and perceptions of teachers via teacher support or the teacher-student relationship are mixed. The present study aims to model students' perceptions of teachers over time from 6th to

9th grade, a critical time period with a reported decline in the relationship between teachers and students. As previously noted, students' perceptions of teacher support tend to decline as students' transition into middle school. I will also test whether there are specific patterns that can be distinguished in perceptions of teachers over time, and whether these patterns are differentially associated with postsecondary outcomes.

Summary

During early adolescence, students often experience declines in motivation and overall academic performance (Eccles, 2008). The declines continue through high school and are associated with negative outcomes such as high school dropout (Archambault et al., 2009; Wigfield et al., 2006). However, students' positive perceptions of teachers during this time period may buffer some of these factors (e.g. Cohen & Geier, 2010; Perry, Liu, & Pabian, 2010; Reyes et al., 2012). There is evidence that students' positive experiences of teacher relationships and interactions is associated with positive outcomes in the short term (Roorda, Koomen, Spilt, & Oort, 2011; Bergin & Bergin, 2009; Davis, 2003; Hamre & Pianta, 2001; Pianta et al., 2003; Skinner & Belmont, 1993). Of note, the results of my literature review did not yield any studies that focused on patterns of perceptions of teachers over time among older students. As such, the longitudinal studies highlighted in this literature review (Wu et al., 2010 and O'Connor & McCartney, 2007), and used to inform study hypothesis, were focused on elementary school students. However, there are studies that highlight the positive associations between the student-teacher relationship and short term academic outcomes (Raufelder, Scherber, & Wood, 2016), as well as studies that highlight the decline of perceptions of teacher support over time among older students (Bokhorst, Sumter, & Westenberg, 2010). The present study

focuses on modeling the change of perception of teachers from 6-9th grades and testing

for differences in trajectories as a function of gender and postsecondary outcomes

(education attainment and education status) during emerging adulthood. In the next

section, I review two theoretical frameworks that inform study hypotheses.

Theoretical Frameworks

A number of theoretical frameworks have been utilized to investigate the effect of

the teacher-student relationship quality and perceptions of teacher support on children's

academic motivation and achievement with several theories. These theories include:

attachment theory (Bowlby, 1988), social motivational theory (Connell & Wellborn,

1991; Furrer & Skinner, 2003), self-determination theory (Ryan & Deci, 2000) and

pedagogical theory (Noddings, 1992). Common to each of these frameworks is the

notion that warm, supportive, connected relationships with primary figures in the child's

environment, or specifically with teachers in the classroom, will foster confidence to

attempt behaviors, engagement and motivation. Two theories with relevance to the

present study are now briefly described, attachment theory and self-determination theory.

Attachment Theory

Attachment theory (Bowlby, 1988) assumes that forming intimate emotional

bonds to particular individuals is a basic component of human nature. The bonds begin

with the primary caregivers, who are expected to protect, comfort and support children

during infancy and childhood. As an individual continues through adulthood and

adolescence, the bonds with the primary caregivers persist and new bonds are formed

with others (such as teachers). The ability to form an intimate emotional bond with

others is considered to be a key feature for effective personality functioning and mental

health. An individual who feels secure in a new environment is likely to explore the environment; however, an individual who is alarmed or feels uneasy in his or her new environment is likely to prefer to stay close to their attachment figure. An individual's sense of security can be further understood by patterns of attachment. An individual with a secure attachment is more likely to feel assured in their ability to explore their environment (Ainsworth, 1989). Specifically, a secure attachment is characterized by confidence that the parent figure will be readily available, responsive and helpful in adverse situations (Ainsworth, 1989). Having the security to engage in exploration promotes human development, growth, and learning (Bowlby, 1988; Birch & Ladd, 1997; Pianta, 1999; Pianta, Nimetz, & Bennett, 1997). Overall, an individual with a secure attachment to a parent figure views the parent figure as a secure base for exploration of the environment.

Teachers can be considered primary caregivers in the school environment. As such, an extended attachment perspective posits that positive relationships with teachers provide emotional security that students need to explore their learning environment and engage in learning activities in a school context (Birch & Ladd, 1997; Pianta, 1999; Pianta, Nimetz, & Bennett, 1997). In a longitudinal study of students from pre-school through 3rd grade by O'Connor & McCartney (2007), the teacher-child relationship was a stronger predictor than peer and insecure maternal attachments on the achievement of children in 3rd grade. Warm and supportive relationships may create a sense of felt security that promotes a child's active participation in classroom activities (Howes et al., 1994; Pianta, 1999). Furthermore, secure relationships allow individuals to confidently explore their environments thereby increasing their sense of competence and autonomy

(Bowlby, 1988). Overall, consistent with attachment theory, students who develop a secure attachment with their teacher will be more likely explore and engage in school activities. Enacting behaviors of exploration and engagement over time may increase the likelihood of obtaining some postsecondary education and of being enrolled in postsecondary education and training during emerging adulthood.

Self-Determination Theory

Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000) is a framework often used to examine motivation and personality development. A fundamental tenet of SDT is that all people seek experiences to fulfill three basic needs (i.e. competence, autonomy, and relatedness) through interaction with the environment, and that satisfaction of these needs leads to the development of autonomous motivation (Deci & Ryan, 1985; Ryan & Deci, 2000). Relatedness refers to the need to be connected through a close emotional bond and secure attachment with others. In school settings, students' need for relatedness is satisfied through the development of positive (authentic and caring) relationships with teachers, peers, and other school personnel. Autonomous motivation is associated with positive school-related outcomes such as higher academic performance, school engagement, and school persistence (Deci et al., 1991; Deci, Koestner, & Ryan, 2001; Ryan & Deci, 2000). As such, based on SDT, students who are able to fulfil their relatedness needs through positive relationships with teachers will be more likely to develop autonomous motivation and will be more likely to have positive school-related outcomes. The fulfilment of the basic need of relatedness in school settings may increase autonomous motivation, leading to stronger academic engagement and performance over time, and may thereby increase the likelihood of obtaining some

postsecondary education, and of being enrolled in postsecondary education and training during emerging adulthood.

Teachers have a greater social impact on students' motivation and learning process than peers, class environment and parental influences (Hattie, 2008). Teacher emotional support contributes to the development of students' sense of connectedness, which further increases school engagement (Johnson, 2009; Libbey, 2004). Furthermore, teacher emotional support has been identified as critical for students' motivation, in that a bond with a specific teacher can increase intrinsic motivation (Colarossi & Eccles, 2003, Federici & Skaalvik, 2014, Raufelder, Scherber, & Wood, 2016). Overall, students' interactions with their teachers provide an opportunity for students to satisfy the basic needs of relatedness and move towards developing autonomous motivation (Deci & Ryan, 1985; Reeve, 2012; Ryan & Deci, 2000).

Summary

Both attachment theory and self-determination theory account for mechanisms that connect student perceptions of their teachers with longer term academic outcomes. In accord with these theoretical frameworks, I expect that students who consistently view teachers positively, or those who develop increasingly positive views of their teachers, will have more positive long term education outcomes. The specific mechanisms that connect perceptions of teachers to these outcomes, such as the development of emotional security or in the fostering of autonomous motivation, are not the focus of this study, rather, I am focusing on patterns of student perceptions over time.

Present Study

Student's middle school experiences of teachers have been associated with proximal outcomes such as engagement and achievement. In this study, I test whether patterns of students' teacher perceptions are also associated with longer term outcomes. Students rated their teachers on a continuum ranging from 1-5 on the extent to which they perceived their teachers as: Unfair (1) to Fair (5), Mean (1) to Nice (5), Cold (1) to Warm (5), Unfriendly (1) to Friendly (5), Bad (1) to Good (5), Cruel (1) to Kind (5), and Dishonest (1) to Honest (5). The longer term outcomes that I examine are education attainment, specifically, the highest level of education completed, and education status, specifically, current enrollment in an educational or vocational training program. Education status is measured because outcomes of the study are assessed when the participants are an average of 20-years-old, and the highest level of education attained will not reflect education and training that is in progress.

Attachment theory (Bowlby, 1988) and self-determination theory (Ryan & Deci, 2000) each provide explanations for how the relationship between the student and teacher might influence student outcomes. According to attachment theory, individuals develop bonds with caregivers that provide the individual with emotional security to explore his or her environment. The concept transfers to school settings with teachers providing that sense of emotional security that allow the student to explore his or her learning environment, thereby increasing school engagement and academic achievement (Birch & Ladd, 1997; Pianta, 1999; Pianta, Nimetz, & Bennett, 1997). Teachers are able to provide that sense of emotional security through warm and supportive relationships (Howes et al., 1994; Pianta, 1999). According to self-determination theory, individuals

develop autonomous motivation through the fulfilment of three basic needs: relatedness, competence and autonomy. Fulfilment of the basic needs leads to the development of autonomous motivation and positive outcomes. Students develop their sense of relatedness in school through their relationships with teachers, peers and other school personnel. As such, students' perceptions of teachers may influence students' postsecondary educational engagement via relatedness and autonomous motivation.

The present study aims to model the change of students' perceptions of teachers from 6th to 9th grade. My research questions, hypotheses, and hypothesized model are presented next.

1. Aim 1: To model an overall class trajectory of students' perceptions of teachers from 6th to 9th grade.

    a. Do students' perceptions of teachers change over time from 6th to 9th grade? If so, are these changes linear?

    b. Is students' gender associated with students' perceptions of teachers?

    c. Do students' perceptions of teachers predict postsecondary outcomes?

2. Aim 2: To explore whether there are different trajectories of perceptions of teachers over time, and whether such trajectories are associated with long term educational outcomes.

    a. Are there identifiable, distinct trajectories of student perceptions of teachers? If so, how many?

    b. Are these trajectories associated with students' gender?

    c. Are these trajectories associated with postsecondary education outcomes?

Hypotheses for Aim 1

Based on the review of literature, I hypothesize that students' perceptions of teachers will generally decline over time (De Wit, Karioja, Rye, & Shain, 2011; Malecki & Demaray, 2002; Reddy, Rhodes, & Mulhall, 2003). With respect to gender, the available literature is mixed but findings generally suggest that girls are more likely to perceive support from teachers than boys (Bokhorst, Sumter, & Westenberg, 2010; Hamre & Pianta, 2001; Wu et al., 2010; Jerome et al., 2009; O'Connor, 2010; Saft & Pianta, 2001). As such, I hypothesize that girls will have more positive perceptions of teachers than boys. Finally, grounded in the empirical literature and consistent with principles of attachment theory (Bowlby, 1988) and self-determination theory (Ryan & Deci, 2000), I expect students with the most positive perceptions of teachers over time to have more positive education outcomes relative to students who have less positive perceptions of teachers over time.

Hypotheses for Aim 2

Based on the findings of O'Connor & McCartney (2007), I hypothesize that there will be distinct trajectories rather than one trajectory that describes all participants. Next, consistent with findings that girls perceive greater teacher support (Bokhorst, Sumter, & Westenberg, 2010; Hamre & Pianta, 2001; Hughes et al., 2010; Jerome et al., 2009; O'Connor, 2010; Saft & Pianta, 2001), I hypothesize that there will be significant gender differences in the trajectories, with girls more likely have positive perceptions of their teachers than boys. Finally, based on the proposed theoretical frameworks, attachment theory (Bowlby, 1988) and self-determination theory (Ryan & Deci, 2000), I hypothesize that trajectories will be differentially associated with long term education

outcomes. Specifically, I expect students with the most positive perceptions of teachers over time to have more positive education outcomes relative to students who have less positive perceptions of teachers over time. Figure 1 illustrates the growth model associated with these hypotheses.
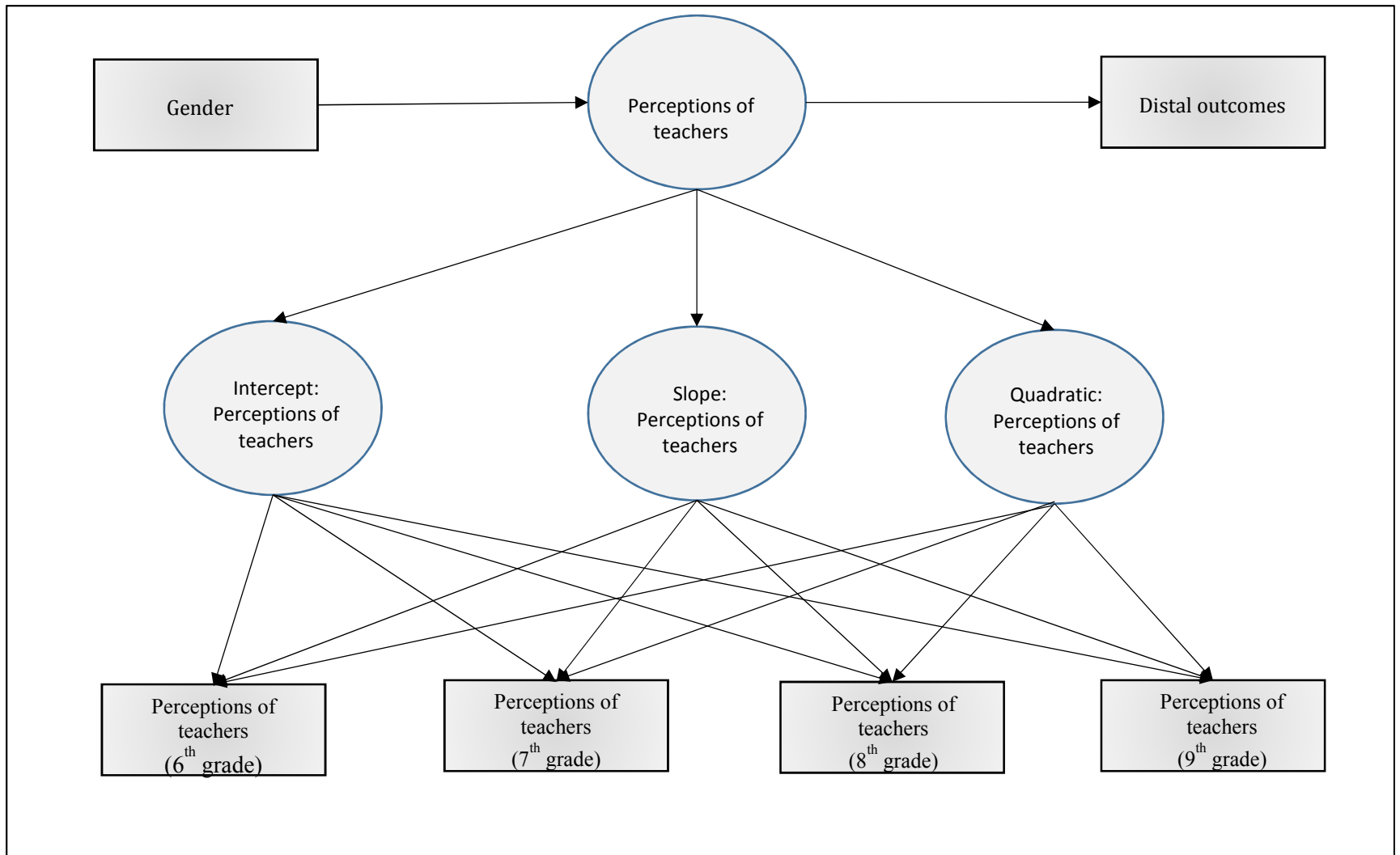
Figure 1. Illustration of proposed growth model for perceptions of teachers from 6th to 9th grade.

CHAPTER II

METHODS

The present study uses existing data from a longitudinal, multi-wave, intervention study (Project Alliance 2 [PAL-2] DA018374; PI Dr. Elizabeth Stormshak). The PAL-2 study addressed adolescents' negative behaviors during middle school to high school. Adolescents, with families, provided information regarding adolescents' perceptions of teachers from 6th to 9th grade. A follow-up assessment provided additional information regarding students' emerging adulthood.

Participants

A total of 593 students from three socioeconomically and ethnically diverse public middle schools in the Pacific Northwest completed survey instruments. Participants in the present study comprised a subsample (N = 415) of the larger randomized control trial (N = 593) who completed the measure at Wave 6 and met all study criteria. The following is the demographic information pertaining to these 415 participants. Participants identified as either female (51.8%, N = 215) or male (48.2%, N = 200). Analysis for this study includes data from Waves 1-4, and Wave 6 of the dataset; 74% of participants responded to instruments during each phase. The average age for participants in Wave 1 was 11.9 years ranging from 10.25 to 13 years. The average age for participants in Wave 2 was 13.1 years ranging from 11.67 to 14.17 years. The average age for participants in Wave 3 is 14.1 years ranging in age from 13.17 to 15.25 years old. The average age for participants in Wave 4 is 15.1 years old, ranging in age from 13.42 to 16.33 years old. The average age for participants in Wave 6 is 20 years old, ranging in age from 17.75 to 22.50 years old. At Wave 6, the participants endorsed the following

for highest level of education completed: 1.4% junior high completed, 12.8% some high school, 37.3% high school, 46.7% some college, 1.2% junior college/ associate degree, and 0.5% college/ university graduation. Additionally, the participants endorsed the following for enrollment in a postsecondary education or vocational training program: 48% yes, and 52% no. The study sample was 35.4% European American, 23.1% Multiracial, 14.9% African American, 14.7% Hispanic, and 11.6% Other. At recruitment, the sample was 36% European American, 18% Latino/Hispanic, 19% Multiracial, 15% African American, 9% Asian/Pacific Islander, and 2% American Indian.

Procedures

Participants in the PAL-2 study responded to self-report survey instruments adapted from an Oregon Research Institute survey and a questionnaire developed by Metzler, Biglan, Rusby, & Sprague's (2001). All students, and corresponding parents, received an invitation to participate with about 80% agreeing to participate. Consent forms were mailed to families or sent home with students and students provided assent the day of the assessment. School personnel administered the paper and pencil questionnaires in school. Students who were absent on the day of the survey administration or had relocated were mailed surveys to complete. Any family that moved was tracked and contacted for each time point through mailed surveys and phone interviews. Collection of survey instruments from the schools occurred during the spring term for each academic year from 2006 through 2010 as participants advanced from the 6th to 9th grade (Wave 1-4). During emerging adulthood (Wave 6), participants were contacted and invited to participate in an assessment of emerging adult behavior outcomes. The instruments were mailed to their home addresses. At each wave, students

received $20 as compensation.

Measures

The Child and Family Center Youth Survey (Dishion, Stormshak, & Kavanagh, 2000) was used to measure all study variables.

Demographic information. Participants provided demographic information about their age, gender, and ethnicity.

Measured at Wave 1 - 4

Perception of teachers. Measurement for perceptions of teachers used 7 items. The participants were asked to respond to "In the past month, how would you describe your teachers?" Items presented with a 5-point Likert scale with the following descriptive words: Unfair(1) to Fair(5), Mean(1) to Nice(5), Cold(1) to Warm(5), Unfriendly(1) to Friendly(5), Bad(1) to Good(5), Cruel(1) to Kind(5), and Dishonest(1) to Honest(5). The index score represented the mean of a composite of the 7-items. Higher index scores represented a higher endorsement of positive qualities. Internal reliability (Cronbach's alpha) for these items for Wave 1 was $\alpha = .91$, Wave 2 was $\alpha = .92$, Wave 3 was $\alpha = .91$ and Wave 4 was $\alpha = .93$. In a previous study using the same data set and measure, perceptions of teachers' were significantly positively correlated with school climate and school safety (Huang, 2012). These findings provide some initial support for measure validity.

Measured at Wave 6

Education Attainment. Measurement of education attainment used a single item, "What is the highest level of education you have completed?" Participants selected one of the following options: 7th grade or less, junior high completed, some high school

(at least one year), high school (GED, public, private, prep, trade), some college (at least one year) or specialized training, junior college/ associate degree (2 years), college/ university graduation (4 years), and graduate professional training, graduate degree.

Education status. Measurement of education status used a single item, "In the last month were you enrolled in an educational or vocational training program". Participants selected either yes or no. Positive responses required students to additionally provide information about the type and length of time in the program.

Power Analysis

A post-hoc power analysis was completed to determine whether the study had adequate power (>.80) to estimate the parameters used to directly assess the research questions. The Monte Carlo procedure carried out using the Mplus program estimated observed power and specified 415 observations and 10,000 replications. For research question 1a power was 1.0 to reject the hypothesis that the mean of the growth factors were zero. For research questions 1b and 1c power was .99 and .94, respectively, to reject the hypotheses that a regression coefficient of .35 predicting the intercept and .15 predicting the growth parameters, both small-to-medium effects, were zero. For research questions 2a-b, power was .82 to reject the hypothesis that at logit coefficient of .30 predicting class membership, a small effect, within a two-class model, was zero. Research question 2c could not be directly estimated with the Monte Carlo procedure as it does not support class membership predicting a distal outcome. However, given adequate power for research question 2b to predict a small effect, there is a high likelihood that research question 2c was adequately powered to detect at least a medium effect.

CHAPTER III

RESULTS

Preliminary Analyses

Data were assessed for assumptions of linearity, normality, and homoscedasticity. Univariate and multivariate assumptions were tenable. The analytic sample consisted of participants meeting the study criteria (i.e. participated in Wave 1 and Wave 6 of the present study). The analytic sample was compared to the remaining participants of the full sample not meeting study criteria (N = 178) on demographic characteristics and students' perceptions of teachers in 6th to 9th grade. A significant difference ($\chi^2[1, 593] = 5.81$, p = .016) existed between proportion of females from the analytic sample compared to the participants in the full sample that did not meet study criteria (51.8% versus 41.0%, respectively). This means that boys were more likely to than girls to not complete Wave 6 of the measure, a factor that will be considered in the discussion of findings. There were no significant differences, however, on any other demographic characteristics or students' perceptions.

Students' perceptions of teachers in 6th to 9th grade were screened for univariate and multivariate outliers. For univariate outlier detection, z-scores were computed for each measure and scores with an absolute value greater than 3.29 were identified. One univariate outlier in the 9th grade, with a value of 1.0, was detected. Multivariate outliers were investigated with Mahalanobis distance using the linear regression procedure in SPSS. The Mahalanobis values were compared to a chi-square distribution with 4 degrees of freedom and set to $p < .001$. One case showed a multivariate outlier, so the latent class growth models were conducted with and without the outlier case.

Intercorrelations, means, standard deviations, and internal validity for all study variables were assessed and presented in Table 2. No serious violations of skew (-1.76 to -1.01) or kurtosis (-0.215 to 0.679) values were found. A majority of the participants, 84.1%, in the sample completed all four reports for perceptions of teachers. In addition, 10.1% had three reports, 4.1% two reports, and 1.7% one report. Students who provided all four reports of data (Wave 1 – Wave 4) were compared to students with missing reports on demographic characteristics and 6th grade report of perception of teachers. Little's MCAR test (χ^2 [19] = 36.26, p = .010) was significant, indicating the data was not missing completely at random. Students with missing data were significantly more likely to be non-White (χ^2 [4, 414] = 11.84, p = .018) and have lower 6th grade reports of teacher perceptions (t [411] = 2.02, p = .047). No student was missing the distal outcomes or gender.

In addition to examining the correlations between waves, which are presented in Table 2, and to obtain further preliminary descriptive information about the data, two MANOVAS were conducted.

Table 2

Correlation Matrix, Means, and Standard Deviations for Study Variables

Wave	Wave (N)			
	1 (414)	2 (380)	3 (380)	4 (387)
1.Students' Perceptions of Teachers Wave 1	–			
2.Students' Perceptions of Teachers Wave 2	.35**	–		
3.Students' Perceptions of Teachers Wave 3	.33**	.38**	–	
4.Students' Perceptions of Teachers Wave 4	.22**	.28**	.37 **	–
M	4.02	3.69	3.63	3.80
SD	.91	.91	.82	.78
α	.91	.92	.92	.92

Note. **$p < .01$. Range for all means is 1 – 5. Higher scores represented a higher endorsement of positive qualities.

Multivariate Analysis of Variance

The first MANOVA was conducted to examine whether students' perceptions of teachers at waves 1-4, varied as a function of education status (whether or not enrolled in an educational or vocational program) and gender (male, female). This analysis was not associated with a research question but was carried out in order to obtain more

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descriptive information about the data. The Box's test of Equality of Covariance

matrices was significant at $p < .05$. Since robustness could not be assumed [F (30,

292845) = 1.69, $p = .011$], the more robust MANOVA test statistic, Pillai's Trace, was

used to interpret the MANOVA results. Results indicated that there were no statistically

significant interactions between education status and gender, Pillai's Trace = .011, F(4,

342) = 0.932, $p = .446$, $\eta^2 = .011$. There were also not a statistically significant main

effect for gender (Pillai's Trace = .004, F(4, 342) = 0.367, $p = .832$, $\eta^2 = .004$), however

there was a main effect for education status (Pillai's Trace = .038, F(4, 342) = 3.404, $p =$

$.010$, $\eta^2 = .038$).

For the main effect of educations status, univariate ANOVA results indicated that

students' perceptions of teachers in 6th grade (wave 1), differed significantly by education

status, [F (1, 345) = 12.712, $p = .000$, $\eta^2 = .036$], but there were no differences in

education status for students in 7th, 8th, or 9th grade. Students who reported enrollment in

a postsecondary education or vocational program had higher mean scores for positive

perceptions of teachers in 6th grade than students who reported no enrollment in

postsecondary education or vocational program.

Furthermore, a second MANOVA was conducted to examine whether students'

perceptions of teachers at waves 1-4 varied as a function of education attainment (7th

grade or less, junior high school completed, some high school, high school, some college

or specialized training, junior college/ associate degree, college/ university graduation,

and graduate professional training/ graduate degree) and gender (male, female). The

Box's test of Equality of Covariance matrices was significant at $p < .01$. Since robustness

could not be assumed [F (50, 19,057) = 1.67, $p = .002$], the more robust MANOVA test

statistic, Pillai's Trace, was used to interpret the MANOVA results. Results indicated that there were no statistically significant interactions among education attainment and gender, Pillai's Trace = .011, $F(16, 1,352) = 0.634$, $p = .858$, $\eta^2 = .007$. There were also no significant main effects for education attainment (Pillai's Trace = .053, $F(20, 1,352) = 0.901$, $p = .586$, $\eta^2 = .013$) and gender (Pillai's Trace = .016, $F(4, 335) = 1.321$, $p = .262$, $\eta^2 = .016$). The results from the two MANOVAs are presented in Table 3.

Table 3 *Student Perceptions of Teachers by Education Status, Education Attainment and Gender*

	Perceptions of Teachers							
	Wave 1[a]		Wave 2		Wave 3		Wave 4	
Categorical Variable	M	SD	M	SD	M	SD	M	SD
Education Status								
Enrolled ($n = 174$)	4.23	0.74	3.71	0.90	3.67	0.80	3.85	0.76
Not enrolled ($n = 175$)	3.90	0.93	3.64	0.91	3.62	0.84	3.78	0.79
Education Attainment								
Junior high completed ($n = 6$)	4.38	0.67	4.28	0.92	3.95	0.87	4.12	0.77
Some high school ($n = 34$)	3.86	0.99	3.45	0.85	3.52	0.73	3.55	0.72
High school ($n = 127$)	4.07	0.91	3.67	0.95	3.69	0.83	3.82	0.84
Some college ($n = 175$)	4.08	0.79	3.70	0.87	3.61	0.83	3.83	0.72
Junior college/	4.17	0.79	4.03	0.66	4.20	0.75	4.46	0.64

associate degree (*n* = 5)								
College/ university graduation (*n* = 2)	3.50	0.10	2.93	1.72	3.35	0.71	3.35	0.71
Gender								
Male (*n* = 161)	4.07	0.92	3.67	0.95	3.60	0.90	3.79	0.79
Female (*n* = 188)	4.06	0.80	3.68	0.87	3.68	0.74	3.83	0.76

Note. Range for all means is 1 – 5. Significant main effects for education status.
a. Significant univariate effect for education status with enrollment > non-enrollment

Single Class Latent Growth Model

The overarching goal of this study was to examine students' perceptions of teachers over time. A Latent Class Growth Model (LCGM) analysis was used to examine the growth of students' perceptions of teachers from 6th to 9th grade. This test assumes that the mean change in students' perceptions of teachers is uniform across the four time points. The change in students' perceptions teachers over time is depicted by a latent intercept and latent slope conceptualized on a continuous scale. For this model, the intercept identifies the starting value of students' perceptions' of teachers (6th grade) and the slope identifies the rate of change.

An initial unconditional LCGM with a one-class solution was estimated to reflect overall students' teacher perception trajectory from 6th to 9th grade. LCGM were estimated with maximum likelihood using the Mplus 7.1 software (Muthén and Muthén, 1998–2012). Model fit was assessed with the chi-square test of model fit using the following recommended cut off values by Hu and Bentler (1999): comparative fit index

(CFI) > 0.95, root mean square error of approximation (RMSEA) < 0.06, and standardized root mean square residual (SRMS) < 0.06.

Estimation of the one class linear only model terminated normally and showed average scores in 6th grade of 3.81 that declined by 0.05 points each year through the 9th grade. However, the linear LCGM fit statistics were poor (Chi-square p-value <.001, CFI = .718, RMSE = .160, SRMR = .119). This indicates that a linear model is not the best representation of the data. Figure 2 is a representation of this model.
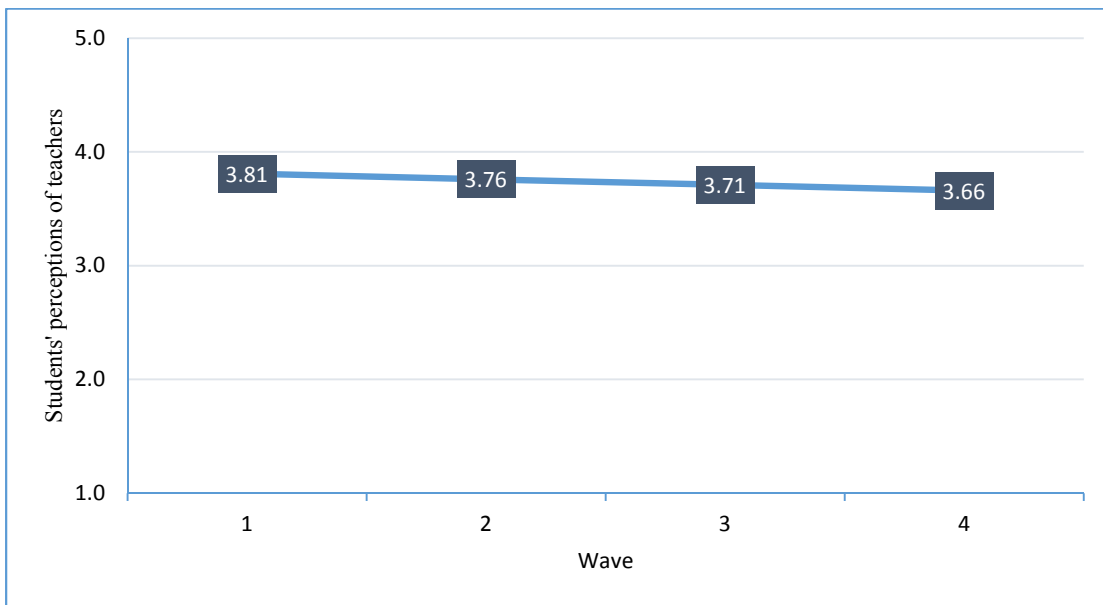

Figure 2. Illustration of results from a single class latent growth model.

Since model fit was poor, a quadratic term was added to the model to examine whether a quadratic model presented a better fit; however, it terminated with a non-positive definite latent variable covariance matrix, meaning that the variance explained by the quadratic term was less than that explained by the null model. Variance for the

intercept, slope, and quadratic terms were examined and the variance for the quadratic term was estimated near zero and non-significant ($p = .968$).

Next, the variance of the quadratic term was set to zero, and the model terminated normally, suggesting that the recursive algorithm moved toward the base case of 6th grade. In other words, the model compared the change of every grade to 6th grade and identified significant differences in the direction of the described slope. For this model, average scores in 6th grade were 3.94 then decreased by 0.45 points per year through the 9th grade, but the decrease decelerated by 0.13 points each year from 7th through 9th grade. The slope and quadratic terms were both significant at $p < .001$. The fit statistics for this model were excellent (Chi-square p-value $= .503$, CFI $= 1.0$, RMSE $= .000$, SRMR $= .033$) and the change in chi-square between the nested models was significant ($\Delta \chi2[1] = 55.05$, $p < .001$). Thus the linear plus quadratic model was retained. The models were rerun excluding the multivariate outlier described above and no meaningful differences in fit or parameter estimates were noted. The results are consistent with my hypothesis of a decline in students' perceptions of teachers from 6th to 9th grade, with evidence to support that the decline is best represented by a quadratic rather than a linear model. Figure 3 is a representation of this model.
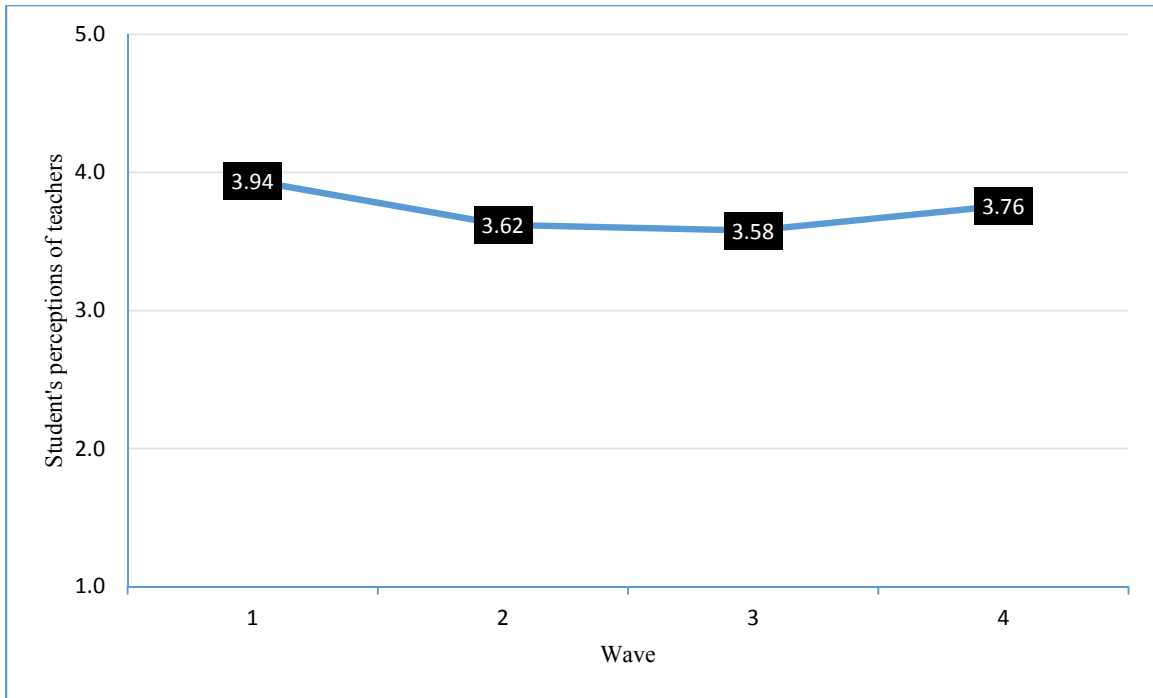
Figure 3. Illustration of single class latent growth model w/ added quadratic term.

Next, to assess whether student gender was associated with students' perceptions of teachers, gender was added as a predictor to the model to predict variability around the estimated intercept and slope means. A predictor helps to identify characteristics that predict group membership in the latent class. There were no significant relationships found between gender and students' perceptions of teachers. This finding was contrary to my hypothesis that girls would be more likely to have positive perceptions of teachers than boys.

In addition, to examine whether students' perceptions of teachers predict postsecondary outcomes, education status and education attainment were added as predictors. Educational status was significantly associated with the intercept (estimate = 0.33, SE = .091, t-value = 3.57, p <.001) and slope (estimate = -0.27, SE = 0.11, t-value =

-2.43, $p = .015$), but not the quadratic term ($p = .116$). Participants who had enrolled in an educational or vocational training program as emerging adults had more positive perceptions of teachers in the 6th grade relative to those who did not enroll, but their perceptions of teachers also decreased over time at faster rate. No significant relationship was found between educational attainment and students' perceptions of teachers. The findings are partially consistent with my hypothesis that students who have more positive perceptions of teachers are more likely to have more positive outcomes than their peers with more negative perceptions. When using the linear model, there is a significant relationship between students' perceptions of teachers and educational status; however, the quadratic model proved to be a better fit for the data, and there were no significant relationships when using the quadratic model alone.

Unconditional Latent Class Model

A series of unconditional LCGMs were performed to explore the potential heterogeneity in trajectories. The Bayesian information criteria (BIC), Lo, Mendell, and Rubin likelihood ration test (LMR), and the bootstrap likelihood ratio test (BLRT) were used to assist in determining the number of classes. Another consideration when determining the number of classes is that no class should have a trivial number of cases ($< 1\%$) assigned to a class. In a latent class growth model, the variance and covariances within each class are set to zero for a clearer identification of number of classes. Once the number of classes is determined, the variances and covariances within the classes are allowed to be estimated to model a more accurate representation of the data and was analyzed with a Growth Mixture Model.

For the three class solution, only 3 (0.7%) participants were assigned to class 1. For the two class solution, however, 348 (83.9%) participants were assigned to class 1 and 67 (16.1%) to class 2. The data is somewhat mixed, but overall suggests a two class model is preferable to a one class model. Table 4 summarizes the model selection criteria for each unconditional LCGM that was used to determine the number of classes to use in subsequent analyses.

Table 4

Selection Criteria for Latent Class Growth Model

Class	Adj. BIC	LMR p-value	BLRT p-value
2	3838	.066	<.001
3	3849	.008	.082

In addition to fit, determining the number of classes also depends on theoretical justification and interpretability. The larger, first class, shows a decline in students' perceptions of teachers from 6th to 7th grade that maintains through the 9th grade. The smaller, second class, shows lower students' perceptions of teachers in 6th grade that increase each year through the 9th grade. Both classes end with approximately the same perceptions in the 9th grade. Figure 4 provides visual representation of the pattern of the LCGM.
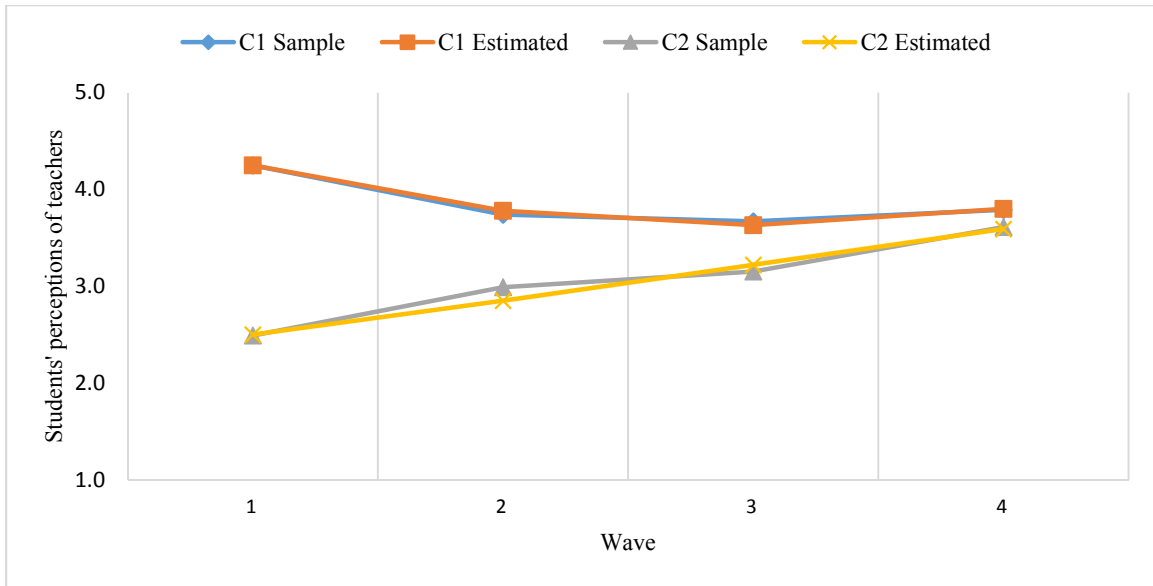
Figure 4. Illustration of the latent class analysis results.

After the number of classes was identified, a Growth Mixture Model (GMM) analysis was conducted to model growth for each latent class. A latent growth curve model captures interindividual differences in change (Jung & Wickrama, 2008). There are three assumptions for the conventional growth modeling approach: (a) individuals come from a single population, (b) a single growth trajectory adequately approximates the whole population, and (c) covariates affect the growth factors the same for each individual. Growth mixture models (GMM) relax these assumptions and allow for differences in growth parameters across unobserved subgroups.

A Growth Mixture Model (GMM) was estimated by allowing the intercept and slope to have unique estimates for each class. With the new variability, class membership changed slightly with 327 (78.8%) participants in class 1 and 88 (21.2%) in class 2. However, estimated and observed sample means for students' perceptions of teachers in the two-class GMM showed a similar pattern to the two-class LCGM. The

similar pattern between the GMM and LCGM further supports the fit of a two class model. Table 5 includes estimated and observed sample means of students' perceptions of teachers scores from 6th to 9th grade for the two classes and for both the LCGM and GMM. Figure 5 provides a visual representation of the pattern of the GMM. Overall, the identification of a 2-class model is consistent with my hypothesis that there would be distinct trajectories in the data.

Table 5
Estimated and Observed Sample Means for Two Classes

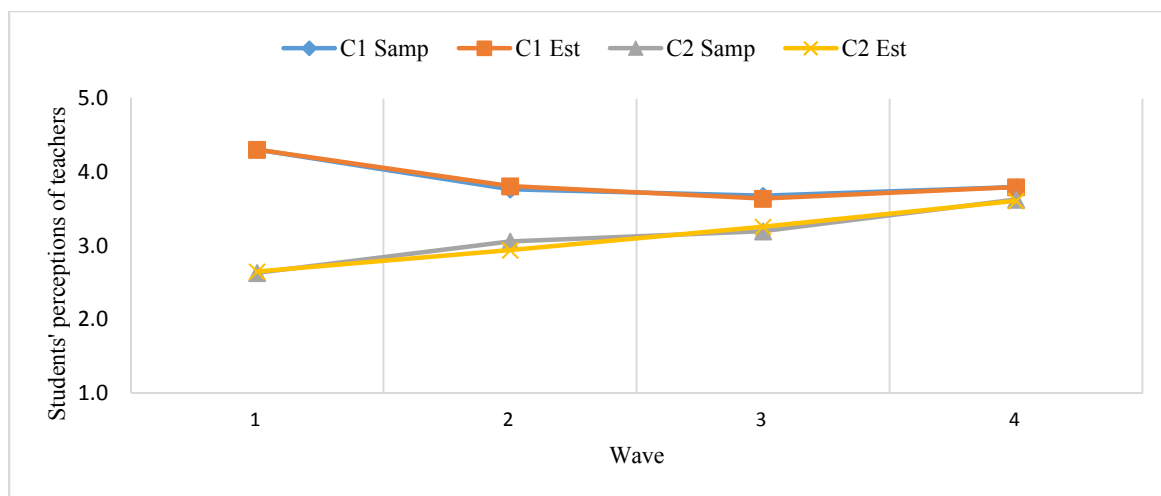| Model	Wave	C1 Sample	C1 Estimated	C2 Sample	C2 Estimated
LCGM	1	4.25	4.25	2.49	2.50
	2	3.74	3.78	2.99	2.85
	3	3.67	3.63	3.15	3.22
	4	3.79	3.80	3.61	3.59
GMM	1	4.31	4.31	2.63	2.65
	2	3.77	3.81	3.06	2.94
	3	3.68	3.64	3.20	3.26
	4	3.80	3.80	3.63	3.61

Note. C1 = Class 1, C2 = Class 2.

Figure 5. Illustration of the growth mixture model results.

Conditional Growth Mixture Model

A two –class GMM was used to test gender as a predictor of class membership, as well as to examine whether class membership predicted the distal outcomes of education attainment and education status. Males were 11% more likely to be in the first class, but the association was non-significant (OR = 1.11, 95% CI [0.61 – 2.04], p = .735). This finding was contrary to my hypothesis that females would be more likely to report a positive perception of teachers.

Additionally, class membership did not significantly predict the distal outcome educational attainment ($\chi^2[1]$ = 1.11, p = .292) with class 1 having a mean attainment of 4.38 on the 8-point scale and class 2 an attainment of 4.25. Likewise, class membership did not significantly predict the distal outcome educational status ($\chi^2[1]$ = 1.97, p = .160) with class 1 having a mean status of 0.55 on the dichotomous indicator and class 2 a mean status of 0.23. These findings were contrary to my hypothesis that students who view teachers positively and have increasingly positive views of teachers will have higher education outcomes than students who had a neutral or negative perception of teachers.

CHAPTER IV

DISCUSSION

The purpose of this study was to model students' perceptions of teachers over time from 6th to 9th grade, to examine whether a relationship existed between students' perceptions of teachers and distal outcomes of education attainment and education status in emerging adulthood, and to examine whether gender was associated with teacher perceptions, the trajectory of perceptions, or the outcomes. Findings were partially consistent with my hypotheses. First, I summarize the results for each aim of the study. Second, I discuss study implications. Third, I describe study strengths and limitations, and provide recommendations for future research. Finally, this chapter concludes with a brief summary reiterating the study purpose and research contributions.

Aim 1

RQ 1a. The first aim of the study was to model an overall class trajectory of students' perceptions of teachers from 6th to 9th grade. The first question addressed whether there was a decline in positive perceptions of teachers over time and whether the change was linear. In this analysis, the linear model yielded significant results consistent with a declining pattern. Specifically, students' positive perceptions of teachers declined by 0.05 points each year through the 9th grade. Although the linear model was significant, tests of model fit yielded a poor fit. As such, the results of the linear model were not the best representation of the data.

Upon further inspection, the addition of a quadratic term improved the fit of the model to the data. The quadratic model also supported a declining pattern, but results further suggested that the rate of decline decelerated starting at 7th grade. It is possible

that the adjustment to middle school influenced the initial decline from 6th to 7th grade, but as the students adjusted to the new environment, the rate of decline slowed. These findings are consistent with prior research describing an overall decline, however the present study findings further highlights a deceleration in the decrease that occurs from 7th to 9th grade.

Based on attachment theory (Bowlby, 1988), the decline in students' positive perceptions of teachers may reflect challenges in students' development of a secure attachment to teachers that could have implications for engagement at school. Furthermore, based on self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000), the decline in students' positive perceptions of teachers may reflect decreasing levels of connectedness with teachers that could have implications for developing autonomous motivation. Based on these two theories, the findings of a declining trajectory in students' perceptions of teachers in the present study may provide a possible explanation to students' declines in motivation and academic performance during early adolescence (Eccles, 2008).

Existing research on students' relationships with teachers support a shift in students' perceptions of teacher support from elementary to middle and secondary school, with students endorsing a perception of lower support from teachers in middle and secondary school than primary school (Bokhorst, Sumter, & Westenberg, 2010). The results from the present study suggest that perhaps the adjustment to middle school (as reflected in 6th to 7th grade perceptions of teachers) may prepare students for the transition to high school (as reflected in 8th to 9th grade perceptions of teachers) with respect to teacher relationships, given that both settings involve interacting with multiple

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teachers each day in contrast with primary school. For example, in primary school students typically are taught by one to three instructors, whereas in middle and secondary school, students typically are taught by different instructors for each of five to seven subjects. Thus, students' perceptions of teachers in primary school may be based on fewer teachers than in middle and secondary school. Further, consistent with SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) it may have been easier for primary school students to develop a sense of connectedness with teachers when they were able to spend more time with a specific teacher and, thereby, aid in the development of autonomous motivation.

In order to better understand the pattern of perceptions of teachers during middle school and high school, future researchers may wish to replicate this study, but specify by subject taught to examine whether the results are impacted by a specific teachers or subject matters since students are more likely to interact with several teachers during middle and high school. Research focused on specific subject matters provides more information on specific factors that are more likely to influence positive student outcomes. For example, a study that examined middle school mathematics classrooms found a positive association between students' perception of teacher affective support and students' motivational, emotional, and behavioral outcomes (Sakiz, Pape & Hoy, 2012).

In past research on student-teacher relationships among middle school students, researchers found that students perceived relationships to be less positive over the course of the school year (Gehlback, Brinkworth, & Harris, 2012). The data for the present study was collected during the Spring term each year over a 6-year period. Future researchers may wish to replicate this study, but include 5th grade assessments, and also

record student perceptions in the Fall term to gather more information about the rate of decline of positive perceptions of teachers, and whether perceptions differ as a function of time of year. Overall, the declining pattern in positive perception of teachers found in this study is consistent with previous research (Bokhorst, Sumter, & Westenberg, 2010; De Wit, Karioja, Rye, & Shain, 2011; Demaray & Malecki, 2002; Reddy, Rhodes, & Mulhall, 2003).

RQ 1b. Next, I examined whether student gender was associated with students' perceptions of teachers. There was no significant association between gender and students' perceptions of teachers in the study sample. This finding was not consistent with my hypothesis that girls would report more positive perceptions of teachers than boys. The research on gender differences and perceptions of teacher support and the teacher-student relationship is mixed (Bokhorst, Sumter, & Westenberg, 2010; Hamre & Pianta, 2001; Hughes et al., 2010; Jerome et al., 2009; O'Connor, 2010; Rueger, Malecki, & Demaray, 2008, Saft & Pianta, 2001); however, in comparison to boys, girls generally report higher levels of support and warmth as well as lower levels of conflict with their teachers (Hughes et al., 2010; Tennant et al., 2015). Additionally, there were no significant findings that boys had more positive relationships than girls (Bokhorst, Sumter, & Westenberg, 2010; Hamre & Pianta, 2001; Hughes et al., 2010; Jerome et al., 2009; O'Connor, 2010; Rueger, Malecki, & Demaray, 2008, Saft & Pianta, 200; Tennant et al., 2015). Not all studies have replicated this gender difference of girls reporting higher levels of support than boys, possibly because of issues of sample size and power (Tennant et al., 2015).

As of 2017, there were no studies focused on overall perceptions of teachers, rather the studies I found were more focused on perceptions of teacher support and the teacher-student relationship, as well as specific qualities related to each of the aforementioned categories (i.e. type of support, level of warmth or conflict in a relationship etc.). The measure of perceptions of teachers used in the present study has not been used in prior research. Although the measure of perceptions of teachers is similar to teacher support and the teacher-student relationship, the measure assesses students' perceptions slightly differently than perceptions of teacher support or the teacher-student relationship. Although the findings on gender differences in the aforementioned studies were mixed, it is possible that gender differences are more likely to be detected with certain types of measures, such as those assessing specific teacher qualities, rather than measures of overall perceptions of teachers. In the present study, a composite score of the items was utilized, so the measure does not represent a particular individual quality but rather the overall perception of teachers across seven qualities. Overall, contrary to my hypothesis, the analyses did not yield significant gender differences in teacher perceptions.

RQ 1c. I examined whether there was an association between students' perceptions of teachers and postsecondary outcomes of education attainment and education status. There was no significant association between students' perceptions of teachers and education attainment. Furthermore, although there was a significant association between students' perceptions of teachers in 6th grade and emerging adult education status in the linear model, and the significant finding was supported by the results of the MANOVAs conducted in the preliminary analysis, tests of model fit

revealed that the linear model was not the best fit for the data. The quadratic model, which yielded a better fit for the data, did not yield any significant association between students' perceptions of teachers and education status. Overall, the lack of significant association between students' perceptions of teachers over time and postsecondary outcomes of education attainment and education status was not consistent with my hypothesis that students with more positive perception of teachers would report more positive education outcomes.

I based my hypothesis on principles of attachment theory (Bowlby, 1988) and self-determination theory (Ryan & Deci, 2000). According to these theories, students who developed a secure base with a teacher or a sense of connectedness would be more engaged in school and develop autonomous motivation. However, although students did not endorse negative perceptions of teachers in the present study, the pattern of positive perceptions of teachers declined. It is possible that the lack of association between perceptions of teachers and positive education outcomes is impacted by the age group of the students. At Wave 6, the participants are between 17 to 22 years old with an average age of 20. Most students do not finish high school until they are 18 and have not had time to obtain a postsecondary degree at the time the measure was administered, which likely restricted the variability in the outcomes. Additionally, the format of the measure of students' perceptions of teachers may have influenced the results. The association between students' motivation and teachers-student relationship is moderated by a well-liked teacher (Raufelder, Scherber, & Wood, 2016). Students in middle school have several teachers and hold positive and negative relationships with different teachers. Based on Raufelder, Scherber, and Wood's (2016)findings that students who can identify

a teacher they like are more likely to have higher levels of academic motivation, perhaps if the measure for this survey was more specific (i.e. with a prompt asking the participant to think about a favorite and/ or least favorite teacher) I could have also examined whether student outcomes differed by specific teachers and whether students who were able to identify a teacher they like had more favorable academic outcomes.

Finally, the studies included in my review that yielded significant findings regarding perceptions of teachers focused on short term outcomes (e.g. Roorda, Koomen, Spilt, & Oort, 2011; Bergin & Bergin, 2009; Davis, 2003; Hamre & Pianta, 2001; Pianta et al., 2003; Skinner & Belmont, 1993). As such, it is possible that the present study did not yield significant findings between students' perceptions of teachers and long-term educational outcomes because of the wide number of factors that operate to influence educational attainment and educational status between 6th grade and emerging adulthood.

Aim 2

RQ 2a. The second aim of the study was to examine potential heterogeneity in trajectories for students' perceptions of teachers from 6-9th grade. Consistent with my hypothesis that distinct trajectories would exist, the analysis yielded a two class solution. In Class 1, students' positive perceptions of teachers declined through 7th grade and then maintained from 8th to 9th grade. The trajectory of participants in Class 1 is consistent with findings in literature reporting a decline in students' positive perceptions of teachers from elementary to middle school years of education. One explanation offered for this decrease is an increased emphasis on instructional interactions relative to relational interactions as grade level rises (O'Connor & McCartney, 2007). For example, students may perceive that teachers are less warm, good, friendly, kind, nice, fair, and honest

because teachers are more focused on delivery of instruction in middle school. Students in Class 1 may have needed more time to adjust to different interactions with teachers. As such, it is possible that students' adjustment to the different interactions with teachers may explain why the declining trajectory maintained from 8th to 9th grade.

For the participants in Class 2 (21.2% of participants), students' initial positive perceptions of teachers were lower at 6th grade than for the participants in Class 1. However, Class 2 students' positive perceptions of teachers increased each year through 9th grade, and by 9th grade, did not differ from those of Class 1 students. The results of the present study suggest that, regardless of the starting point in 6th grade, students' perceptions of teachers seem to converge in 9th grade.

Perhaps students in Class 2 preferred the shift in instruction interaction (i.e., instructional vs relational) previously described. Although a review of the literature did not reveal any studies that measured differences in instructional interactions and perceptions of teachers for students in middle school, some of the literature points to the relationship between emotional and instrumental support for students in 9th and 10th grade, their mathematic teachers, intrinsic motivation, help-seeking behavior, effort, and math anxiety (Federici & Skaalvik, 2014). In the aforementioned study, secondary school students benefited the most from instrumental support (Federick & Skaalvik, 2014). Perhaps the students in Class 2 of the present study were lacking instrumental support during primary school and received more instrumental support in middle school. As such, a preference for instrumental support may explain the overall lower but increasing trajectory of the students' positive perceptions of teachers in Class 2.

In a previous study that followed student perceptions of teachers over time, specifically the teacher-student relationship, O'Connor and McCartney (2007) reported findings that differ somewhat from the present study. Consistent with O'Connor and McCartney's study (2007), the present findings included a decrease in positive perceptions of teachers over time and two trajectories of change. However, O'Connor and McCartney (2007) found that within the multiple trajectories of change, the trajectory with the majority of participants demonstrated an increase in relationship quality over time, suggesting that the overall declining trajectory was not the best representation of the sample. The differences between the O'Conner & McCartney (2007) study and the present study may be due to the differences in type of teacher perception measured, assessment instruments used, and age of participants. The present study was focused on overall perceptions of teachers, and not the teacher-student relationship, used different assessment instruments, and focused on students in 6th to 9th grade whereas O'Connor & McCartney's (2007) study focused on students from preschool through 3rd grade.

Overall, a shift in interactions between students and teachers may exist from primary to secondary school and influence student's overall perceptions of teachers. However, the shift may refer to different types of support that include both relational and instructional interactions, with students benefiting to varying degrees. Future studies could clarify the similarities and differences between students' perceptions of instructional and relational interactions, and types of teacher support.

RQ 2b. Next, I examined whether gender was associated with class membership. There was not a significant association between class membership and gender. This finding was not consistent with my hypothesis that girls would be more likely than boys

to report more positive perceptions of teachers. It is possible that no differences were found because the assessment measure of perceptions of teachers was not specific to a particular teacher. Perhaps a focus on a specific teacher, and the inclusion of information about demographic characteristics (e.g. gender) or subject taught (e.g. math, history, art, etc.) would help refine and extend previous findings of gender differences. Future studies could focus on whether teacher and student gender correspondence a factor that influences students' perceptions of teachers. Furthermore, future researchers could examine teachers of specific subjects to examine whether differences in perceptions of teacher by gender exist based on academic subject (e.g. math, history, art, etc.).

RQ 2c. Finally, I examined whether class membership was associated with education attainment and status. There was not a significant association between class membership and the distal outcomes of education attainment and status. Whether teacher perceptions declined or improved, they converged in 9th grade and the pattern was not associated with outcomes. These findings were not consistent with my hypothesis that students with more positive perceptions of teachers would have more positive outcomes. Overall, the lack of differences may be explained by the weak correlations in students' perceptions of teachers between waves. This may be due to having multiple teachers within each school year or different teachers each year in school. Finally, students' perceptions of teachers all converge in 9th grade, which may also account for the lack of differences between those enrolled in postsecondary education programs and those who are not, as well as those who have attained some postsecondary education and those who have not.

Implications

Practice Implications

In the present study students' positive perceptions of teachers at 6th grade were associated with a higher likelihood of enrollment in a vocational or educational training program after high school. Furthermore, the pattern of teacher perceptions from 6th to 9th grade did not discriminate between those who were and were not enrolled in postsecondary programs, or the amount of education that participants had obtained.

The larger literature on teacher-student relationships and students' perceptions of teachers show consistent associations with academic achievement (i.e. Longobardi, Prino, Marengo, & Settani, 2016; Tennant et al., 2015). Even though the findings suggest a decline in most students' positive perceptions of teachers, the results of the present study do not suggest students' perceptions of teachers become negative overall. It may be that the lack of association between the pattern of perceptions and the distal outcomes is due to the type of outcome measured, the manner by which it was measured, or because so many other factors are also at play between the beginning of high school and emerging adulthood.

The findings of a declining but decelerating trajectory of students' positive perceptions of teachers over time may reflect students' perceptions of the overall school climate. This is because teachers play an important role in fostering a positive school climate and in how the climate is perceived. As previously mentioned, school climate is positively associated with student academic performance and engagement (MacNeil, Prater & Busch, 2009). Based on the findings of the present study, follow up research

that includes measures of school climate may help to determine whether the present findings are a reflection of climate perceptions overall.

Research Implications

This study examined the change in students' perceptions of teachers from 6th to 9th grade. Literature on students' perceptions of teachers describes a decline from elementary school to middle school. The findings for this study show a decline from 6th to 9th grade with the decline decelerating between 7th to 9th grade.

A linear model was introduced first in the present study. Although there was a significant relationship in the linear model between students' perceptions of teachers and education status, overall the model offered little information because of poor model fit. A quadratic model proved a better fit for the data, representing perceptions of teachers that both declined and decelerated over time. However, there were no significant relationships in the quadratic model between students' perceptions of teachers and distal outcomes of students' education status and attainment. Overall, the quadratic model results support that an enhanced understanding of data can result when non-linear model analyses are conducted on longitudinal studies of student outcomes.

Research on gender differences regarding perceptions of teachers is mixed. There were no significant differences by gender in any of the models presented in the present study. The lack of significant findings regarding gender differences could mean that girls and boys have the same pattern over time. Additionally, the overall scores for the present study are similar at each wave for both genders. As previously mentioned, the measurement of students' perceptions of teachers in the present study was broad. Studies that have yielded significant findings regarding gender differences focused on measuring

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specific characteristics of the teacher relationship. For example, girls rate emotional and appraisal support as more important relative to boys (Tennant et al., 2015) and girls are more likely to perceive higher levels of closeness with teachers than boys (Wu et al., 2010). Overall, these results suggest that gender differences may be more likely to emerge when using measures of specific teacher characteristics.

Next, as previously mentioned, the findings of the present study showed a declining but decelerating trajectory of students' positive perceptions of teachers over time. This trajectory may reflect students' perceptions of the overall school climate, since teachers play an important role in fostering a positive school climate and in how the climate is perceived. Future researchers could examine factors that may impact the change of students' positive perceptions over time to help school administrators identify how to improve overall students' positive perceptions of teachers and improve overall school climate.

Furthermore, there was a lack of a significant associations between students' perceptions of teachers and postsecondary outcomes. This finding was inconsistent with literature on the influence of perceptions of teachers (i.e. teacher support and the teacher student relationship) and short term indicators of academic achievement (i.e Raufelder, Scherber, & Wood, 2016; Roorda, Koomen, Spilt, & Oort, 2011). As previously mentioned, the research reviewed for this study was based on specific perceptions of teachers rather than overall perceptions of teachers. The differences in findings may be due to the use of different measures of perceptions of teachers. In addition to focusing on the overall perceptions of teachers, the present study examined long term outcomes of education attainment and education status, whereas other studies focused on academic

achievement (i.e. GPA, standardized test results) or other short term outcomes (i.e. psychosocial well-being, motivation). None of the studies reviewed measured long term outcomes, as such the examination of long-term outcomes is unique to the present study. Overall, positive short term outcomes, therefore, are not necessarily predictive of positive long term outcomes and may explain the discrepancy in findings.

Strengths, Limitations, and Recommendations for Future Research

Strengths

There are several strengths in the present study. Overall strengths of the study include: a diverse sample, longitudinal dataset, and use of distal outcomes. The ethnic composition of the sample was diverse as well as the education status for participants at Wave 6 (college and non-college attending). The study was longitudinal and I was able to model change over time and examine associations with two distal outcomes. Based on my literature review, there were only two previous studies that examined perceptions of teachers over time (O'Connor & McCartney, 2007; Wu et al., 2010). Both of these previous studies examined teacher-student relationships with a younger sample and focused on short-term outcomes, and found positive associations between the quality of the teacher-child relationships and students' achievement and classroom engagement (O'Connor & McCartney, 2007; Wu et al., 2010). Thus, the present study makes a unique contribution to the literature.

Limitations

This study also has several limitations. Overall limitations of the study include: missing data, measurement of study variables, and gender differences between analytic and the remaining participants of the full sample not meeting study criteria. An analysis

of missing data yielded significant differences in both the ethnic composition of those with missing data as well as perceptions of teachers. Participants missing data were more likely to be non-White and have less positive teacher perceptions at 6th grade. It is possible that missing data influenced the results, though the data was accounted for using Full Estimation Maximum Likelihood. Findings of the present study may be more relevant to White than to non-White participants.

Another limitation to this study involves the measurement of study variables. The postsecondary outcomes of participants were measured as categorical outcomes. The use of categorical outcomes, when examining a population in transition, may not provide as much information as continuous data measuring those same outcomes. It would be beneficial to also collect information about future postsecondary plans or intentions, in addition the information about current status. In the present study, the outcome of education status was added to account for participants who were still in the process of completing an educational or vocational program that was not addressed in the education attainment measure. The measurement of perceptions of teachers was a limitation due to limited validity evidence for this measure. Furthermore, the measurement prompt (i.e. In the past month, how would you describe your teachers?) is broad, and participants may have ranged quite a bit in whether they were thinking about one or several teachers. Greater evidence of the validity of the measure would increase confidence in the findings.

A final limitation to this study involves gender differences between analytic sample and participants from the full study samples that did not meet study criteria. An analysis examining differences between demographic characteristics and students' perceptions of teachers from 6th to 9th grade yielded a significant difference between the

rates of females in the full sample compared to the analytic sample, with a higher percentage of female participants in the analytic sample. The participants included in the analytic sample were those who completed the survey in both Wave 1 (6th grade) and Wave 6 (age 20) of the study. The differences in participation rates could be a result of attrition (Hansen, Tobler, & Graham, 1990). The possibility exists that attrition influenced the results in a manner that was not accounted for by the use of Full Estimation Maximum Likelihood.

Recommendations for Future Research

A strength of the present study was the use of a longitudinal data set. The present study examined a pattern over time. Furthermore, I was able to identify two distinct trajectories to describe students' perceptions of teachers from 6th to 9th grade. Future research modeling growth of students' perceptions of teacher relationships (i.e. perceptions of teachers and teacher support, and teacher-student relationship) should assess heterogeneity in trajectories to have an enhanced understanding of patterns in the data.

Given that measurement of the study variables limited interpretation of outcomes, future researchers should use valid and reliable measures, measures that capture more variability, and use multiple measures of the same constructs.

Finally, researchers should study differences between change in patterns of students' perceptions of teachers between traditional grade structure and different grade structures such as K - 8th or K - 12th grade to be able to better identify characteristics that are more likely to influence the decline. For example, Schwerdt and West (2013) conducted a longitudinal study to examine the effect of transitions in school on academic

achievement, and compared students in middle schools and K - 8 schools. These researchers found that students who transitioned into middle school experienced a drop in achievement in math and English relative to their K - 8th counterparts. A study examining whether perceptions of teachers shift in different school environments may be able to clarify and/or identify specific factors that contribute to more positive teacher/student relationships and more positive academic outcomes.

Conclusion

The purpose of this study was to examine the change in students' perceptions of teachers from 6th to 9th grade, whether there were distinct trajectories in students' perceptions of teachers, and; associations between gender and students' perceptions of teachers, perceptions of teachers and postsecondary outcomes (education attainment and education status), and between the trajectory of students' perception of teachers and postsecondary outcomes. The findings contribute to the literature by providing more information about the pattern of decline of students' positive perceptions of teachers from 6th to 9th grade and identifying two trajectories. One trajectory with a that the decline appears to decelerate from 7th to 9th grade, and another trajectory with overall lower initial positive perceptions of teachers that increased each year through 9th grade. At 9th grade, both trajectories had similar values for students' positive perceptions of teachers, that is, students' perceptions of teachers seem to converge in 9th grade for both trajectories. Furthermore, although previous findings have described an overall decline in student-teacher relationships and perceptions of teacher support (e.g. Bokhorst, Sumter, & Westenberg, 2010; De Wit, Karioja, Rye, & Shain, 2011), the present study

identified that the decline was not linear and instead the decline appeared to decelerate from 7th to 9th grade.

Although there were no significant associations found between the change in perceptions of teachers and postsecondary outcomes, the modeled trajectory is consistent with other student performance measures taken during this time period (i.e. reported declines in academic achievement and school engagement; Eccles, 2008). Continued research on the relationship between perceptions of teachers over time, and academic and other outcomes connected to these patterns, may be of great use in improving educational outcomes.

APPENDIX A

DEMOGRAPHIC INFORMATION

1. What is your gender?
   ○ Male
   ○ Female

2. Your birthday: (month/day/year) ☐☐ / ☐☐ / ☐☐☐☐

4. Racial Group: *(check all that apply)*
   ☐ European American/White
   ☐ Native American/American Indian/Alaskan Native
   ☐ African American/Black
   ☐ Hispanic/Latino
   ☐ Asian American
   ☐ Pacific Islander/Hawaiian
   ☐ Other (describe): _____

APPENDIX B

PERCEPTIONS OF TEACHERS

3. In the past month, how would you describe your teachers?

	1	2	3	4	5	
Unfair	○	○	○	○	○	Fair
Mean	○	○	○	○	○	Nice
Cold	○	○	○	○	○	Warm
Unfriendly	○	○	○	○	○	Friendly
Bad	○	○	○	○	○	Good
Cruel	○	○	○	○	○	Kind
Dishonest	○	○	○	○	○	Honest

APPENDIX C

EDUCATION ATTAINMENT

1. What is the highest level of education you have completed?
    - O 7th grade or less
    - O Junior high completed
    - O Some high school (at least one year)
    - O High school (GED, public, private, prep, trade)
    - O Some college (at least one year) or specialized training
    - O Junior college/Associate degree (2 years)
    - O College/University graduation (4 years)
    - O Graduate professional training, graduate degree

APPENDIX D

EDUCATION STATUS

3. In the **last month**, were you enrolled in an educational or vocational training program?

　○ No *(skip to question #4)*

　○ Yes → a. What type?　○ 4 year college
　　　　　　　　　　　　○ 2 year college
　　　　　　　　　　　　○ Vocational training (cooking school, technical school, etc.)
　　　　　　　　　　　　○ Other (specify): _____

　　　　→ b. What program? _____
　　　　　　　　　　　　　　(i.e., college major, area of training program, etc.)

　　　　→ c. How long have you been enrolled in this program?　☐☐　**months**

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