Chronic disease, depression, and adult attachment within romantic relationships: A longitudinal analysis of trajectories of physical health

by

Cameron Clark Brown

B.S., Brigham Young University, 2011
M.S., Brigham Young University, 2014

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Family Studies and Human Services
College of Human Ecology

KANSAS STATE UNIVERSITY
Manhattan, Kansas

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# Abstract

Despite previous literature illustrating strong links between social relations, mental health, and health outcomes, much remains unknown regarding the associations among adult romantic attachment, depression, and reports of physical health within those diagnosed with a chronic disease. Using a sample of 197 individuals who reported a diagnosed chronic disease and in a cohabiting or romantic relationship from the Flourishing Families Project, a mediated latent growth curve analysis was used to test to what extent trajectories of reported physical health across two years were a function of attachment and depression. Specifically, trajectories of physical health were modeled to examine changes over two years with time-invariant covariates of depressive symptoms and adult attachment predicting initial levels of physical health and changes in physical health over time. Results indicated that as depressive symptoms increased, initial levels of physical health were worse. Higher reports of attachment anxiety were linked with better initial reports of physical health. Further, higher reports of depressive symptoms and attachment anxiety predicted a significant upward shift in the expected trajectory of improved physical health. These results expand current research and theory by examining how adult attachment and depression are linked with expected trajectories in physical health over time.

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Despite previous literature illustrating strong links between social relations, mental health, and health outcomes, much remains unknown regarding the associations among adult romantic attachment, depression, and reports of physical health within those diagnosed with a chronic disease. Using a sample of 197 individuals who reported a diagnosed chronic disease and in a cohabiting or romantic relationship from the Flourishing Families Project, a mediated latent growth curve analysis was used to test to what extent trajectories of reported physical health across two years were a function of attachment and depression. Specifically, trajectories of physical health were modeled to examine changes over two years with time-invariant covariates of depressive symptoms and adult attachment predicting initial levels of physical health and changes in physical health over time. Results indicated that as depressive symptoms increased, initial levels of physical health were worse. Higher reports of attachment anxiety were linked with better initial reports of physical health. Further, higher reports of depressive symptoms and attachment anxiety predicted a significant upward shift in the expected trajectory of improved physical health. These results expand current research and theory by examining how adult attachment and depression are linked with expected trajectories in physical health over time.

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# Dedication

To Anna, Henry, Cosette, Mom, Dad, Jared, and Jason: thank you for providing an environment for me to flourish.

# Chapter 1 - Introduction

Chronic diseases currently account for more mortalities than all other causes combined at approximately 38 million each year (World Health Organization, 2012). Some scholars estimate that 117 million adults in the United States are currently diagnosed with some form of a chronic disease (Ward, Schiller, & Goodman, 2014) and that seven of the top ten leading deaths in the U.S. in 2014 were from chronic diseases (Heron, 2016). In 2010, those with a chronic disease accounted for the majority of Medicare expenditures with increases in spending per diagnosed chronic disease (Centers for Medicare and Medicaid Services, 2012). These prevalent and costly chronic diseases include: arthritis, asthma, cancer, cardiovascular diseases, diabetes, high blood pressure, respiratory problems, stroke, hepatitis, failing kidneys, nephritis, nephrotic syndrome, nephrosis, pulmonary disease, emphysema, chronic bronchitis, and Alzheimer's.

In an effort to further explore methods to improve physical health of those with chronic diseases, research examining broader systemic facets of individuals such as their social relationships and their connection with physical health outcomes began gaining traction in the 1980s (House, Landis, & Umberson, 1988). For example, strong links between close relationships and physical health have been well-established within existing literature (For a review see Waite & Gallagher, 2000). Further, relationships such as marriages may assist in better management of disease and offer encouragement of healthier decisions (DiMatteo, 2004). Family cohesion has been linked to less severe symptoms with a chronic disease (Rosland, Heisler, & Piette, 2012). Other systemic facets such as depression have previously been shown to exacerbate physical symptoms in those who are chronically ill (Moussavi, Chatterji, Verdes, Tandon, Patel, & Ustun, 2007). Despite research illustrating the importance of considering social relationships when understanding physical health and chronic diseases, minimal research has

considered the link between specific characteristics of romantic adult attachment and physical health among those who have a chronic disease (Kowal, Johnson, & Lee, 2003). This is an important gap to explore due to previous studies indicating links between attachment, depression, and physical health (Armitage & Harris, 2006; Lopez & Brennan, 2000; Scott et al., 2007).

The present study sought to identify more specific relational characteristics that may be related to physical health changes over time by examining romantic adult attachment and depression as a part of this systemic context that may contribute to physical health. Specifically, the purpose of this study was to examine trajectories of physical health of those with a chronic disease across a two-year period. Further, the present study examines the magnitude of the associations between anxious and avoidant attachment scores with depressive symptoms, and in turn the associations between depressive symptoms with concurrent levels of physical health and trajectories of change in physical health across two years. In other words, this study examines how depressive symptoms may mediate the link between attachment anxiety and avoidance with reports of physical health. A longitudinal sample obtained from 2009 to 2011 of 197 individuals with at least one chronic disease and currently in a cohabiting or married relationship will be used to examine this purpose. These results may have important clinical implications for medical and helping professionals by identifying modifiable factors associated with improved physical health across time in those who have been diagnosed with a chronic disease.

# Chapter 2 - Literature Review

**Theoretical Foundation**

In a review and interdisciplinary synthesis of academic arguments and research explaining social relationships and their correlation to health outcomes, Tay, Tan, Diener, and Gonzalez (2012) suggested that this link is multi-faceted and systemic. Rather than direct links between social relationships and physical health, they suggested indirect links through other systemic characteristics. Tay et al. (2012) proposed the construct of psychological functioning as a bridge between social relationships and physical health outcomes. For example, social relationships that do not include companionship and encouragement are predictive of poorer psychological functioning including higher rates of depression. This psychological functioning is then in turn predictive of health outcomes including general physical health (see Figure 1). As a part of this explanatory model, romantic adult attachment, as a dimension of social relationships, is minimally addressed in the present literature indicating a gap in the present state of research regarding social relations and the physical health of those with a chronic disease.

John Bowlby, a pioneer in the development of attachment theory suggested that the attachment system has the ability to bolster resilience during stressful events (1988). Put simply, closer and more intimate relationships with reliable individuals may promote emotional strength and the ability to withstand difficult experiences. Thus, romantic attachment within the adult relationship may be an important systemic facet to consider when considering an ongoing stressor, such as chronic disease. Three types or styles of adult attachment have been delineated in previous literature: secure, avoidant, and anxious (Hazan & Shaver, 1987). Secure adult attachment is most broadly defined as the ability to be close to others with bidirectional dependence, without excessive worry about abandonment or being too close to others. Avoidant

adult attachment is characterized by being uncomfortable being close to others, while also struggling to trust others. Anxious adult attachment is characterized as an individual continually worrying about being abandoned by their partners and that others do not truly care for them (Hazan & Shaver, 1987). Higher degrees of avoidant and anxious attachment behaviors are broadly defined as insecure attachment (Hazan & Shaver, 1987). Previous research has indicated that avoidant and anxious attachment styles are predictive of more depressive symptoms (Cooper, Shaveer, & Collins, 1998; Wei, Shaffer, Young, & Zakalik, 2005) and possible exacerbation of physical health concerns (Meredith, Ownsworth, & Strong, 2008). The present study uses Tay et al.'s (2012) systemic link between social relationships and physical health outcomes as a foundation to examine other facets of social relationships, such as adult attachment, and their links with health outcomes among those who are chronically ill.

**Physical Health Trajectories of those with a Chronic Disease**

Previous research examining prevalent chronic diseases has indicated that physical health progressively declines for many, as the specific disease advances over time (Murray, Kendall, Boyd, & Sheikh, 2005). One systematic review of existing research suggested three typical trajectories of physical health in those with common chronic diseases: a short period of clear and steep decline, longer-term decline with intermittent serious drops, and slow progressive/prolonged decline. All three of these suggested trajectories illustrate progressive decline over a period of weeks, months, or years (Murray et al., 2005). Other research echoes declines such as these, indicating that many systemic facets such as social relationships and psychological functioning, but especially that of physical health of chronically ill individuals, decline as time passes and their disease progresses (Murray, Kendall, Grant, Boyd, Barclay, & Sheikh, 2007).

**Social Relations and Physical Health**

Although adult attachment and its link with physical health outcomes is in its infancy, other elements of relationships have illustrated significant links with physical health outcomes. Specifically, a worsening in physical health trajectories may be linked with social relationships (Tay et al., 2012; Uchino, 2006). These social relationships may come in various forms, but two important predictors of physical health are important to acknowledge: social integration and social support (Cohen, 2004). Social integration has often been interpreted as the number of social relationships, types of relationships, and frequency of contact (Taylor, 2007). Social support has been previously defined as the perception that one is loved and valued by others as part of a mutually acknowledged social network (Wills, 1991).

Broadly, social relationships have been linked to various health measures including health behaviors (i.e., diet, exercise, etc.) and health outcomes (i.e., mortality, disease, general health; Tay et al., 2012). For example, one nationally representative study in the United States population indicated that as reports of social and emotional support decreased, the prevalence of poor general health and obesity increased (Strine, Chapman, Balluz, & Mokdad, 2008). Further, approximately 10% of this sample indicated that they rarely or never receive emotional or social support, thus illustrating a strong prevalence of limited social support for the average American (Strine et al., 2008). Other research has suggested that unmarried individuals have higher cardiovascular mortality rates contrasted to those who are married (Frasure et al., 2009), whereas those that are happily married have better overall health (Waite & Gallaher, 2000).

In a 2006 review of research regarding health and social relations, Uchino suggested that social support and health outcomes were systemically linked. Specifically, social support was related to the health outcomes of disease morbidity and disease mortality through health

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behaviors such as diet and exercise, as well as psychological functioning including depression and physical health. This existing research supporting a link of social support with physical health offers hope to specific relational elements such as adult attachment and as a possible link to physical health outcomes. Social support, offers a similar dimension to adult attachment in that it is evaluating one's perception of being loved and supported by others (Tay et al, 2012; Wills, 1991). Thus, there is some evidence that incorporating more specific elements offered by adult attachment, such as an individual's ability to love and support others, may offer new insights of how relationally oriented constructs are linked to physical health outcomes. Specifically, integrating more relational elements of a system, such as adult attachment, may advance research toward a better understanding of how to best treat and support those with chronic disease.

**Attachment and Physical Health**

Despite established links between social support and physical health (Tay et al., 2012), research considering adult attachment and chronic conditions has been introduced, but has received minimal attention (Maunder & Hunter, 2001). One study suggested that avoidant attachment was significantly related to elevated psychological symptoms (depression, anxiety) and physical symptoms (coughing, back pain) (Kotler, Buzwell, Romeo, & Bowland, 1994). More recent research echoes these findings indicating that more securely attached participants reported significantly fewer physical symptoms contrasted with participants who were insecurely attached (Armitage & Harris, 2006). Other research has indicated that insecure attachment is related to more vulnerability to problematic adjustment to chronic pain onset (see Meredith et al., 2008). Further, recent research has linked specific attachment styles (avoidant, anxious, and secure) with chronic pain, where insecure attachment styles were related to an increase in the

number of different spots of pain on the participant's body and the degree of pain-related disability (Davies, Macfarlane, McBeth, Morriss, & Dickens, 2009). These findings corroborate the importance of considering attachment within relationships when seeking to improve health outcomes.

With previous literature suggesting that being securely attached in a relationship is considered an "inner resource" that allows the individual to fair better with stressors, it may be important for helping professionals to foster a secure attachment relationship within couples in which one or both partners have a chronic disease (Mikulincer & Florian, 1998). Clinical research has emphasized the importance of attending to attachment when assisting couples where chronic diseases are present. Kowal et al. (2003) argued that attending to attachment within adult romantic relationships through Emotional Focused Therapy (EFT), may improve the couple's relationship as well as contribute to better outcomes for the chronically ill partner. Research has suggested that EFT used with couples where one partner is chronically ill, may not only lead to improvement in couple satisfaction, but also an improvement in quality of life for those who are ill (Ghedin et al., 2016). Although attachment and chronic disease research and theory may be in its infancy, through the limited studies available, Kowal et al. (2003) suggests promise for future development and progress to best assist couples where chronic disease is present.

**Attachment and Depression**

Previous literature has indicated that people who are securely attached in their romantic relationships are significantly less depressed contrasted to those that are insecurely attached to their partners (Lopez & Brennan, 2000). Further, other research has indicated that securely attached individuals demonstrate more adaptive coping in response to negative emotions and overall adjustment. Specifically, those with anxious and avoidant attachment styles generally

report being more depressed and struggling more in coping with negative emotions (Cooper et al., 1998; Wei et al., 2005). One study suggested that those individuals who reported even moderately insecure attachment were more likely to experience depressive symptoms over a 12-month period (Bifulco, Moran, Ball, & Bernazzani, 2002). Clinical research has indicated that an attachment-focused clinical approach such as EFT (Johnson, 2004) may reduce couple tension as well as depressive symptoms, (Denton, Wittenborn, & Golden, 2012); with some research suggesting that EFT was just as effective as pharmaceutical interventions for reducing depressive symptoms (Dessaulles, Johnson, & Denton, 2003).

**Depression and Physical Health**

Depressive symptoms and other mental health challenges have been linked to physical health (Scott et al., 2007), both as a predictor of health (Lett et al., 2004) and also as a consequence of health conditions (Nouwen et al., 2010). In a worldwide study, comorbid depression was present among 23% of the 245,000 participants from 60 countries with diagnosed physical diseases including angina, arthritis, asthma, and diabetes. Considering depression as comorbid with chronic disease was reinforced when, after accounting for socioeconomic factors and the present condition of the health of the participant, depressive symptoms were more closely associated with decreasing physical health scores than other comorbid physical conditions in the study (Moussavi et al., 2007). Other research has indicated that depressive symptoms were linked with cardiovascular disease mortality over several decades (Whang et al., 2009). The link between depression and physical health was strengthened in a systematic review that concluded that not only do strong links exist between depression and health, but depression is itself an important risk factor for heart disease, stroke, and diabetes. This review also posited that depressive symptoms might even worsen disease specific symptoms post-diagnosis (Clarke

& Currie, 2009). In conclusion, existing research and literature reinforce the importance of including depressive symptoms when evaluating physical health trajectories.

# Chapter 3 - The Present Study

With an estimated one in three persons in the United States having a diagnosable chronic disease (Ward et al., 2014), further attention and research is needed in supporting and assisting these individuals. The present study seeks to extend current research by identifying whether adult attachment and depressive symptoms are linked with trajectories of physical health among those who have a chronic disease. These results may offer unique insights for helping professionals in best supporting couples where a chronic disease is being managed.

Using Tay and colleagues' (2012) explanatory model of social relationships and physical health, and including attachment theory (Bowlby, 1988; Hazan & Shaver, 1987) as a guide, the present study seeks to answer the call of Kowal, et al. (2003) for further research that considers adult attachment within couples where chronic diseases are present. The following four hypotheses propose longitudinal links between adult attachment, depressive symptoms, and reports of physical health outcomes, among heterosexual couples where one partner had a diagnosed chronic disease:

H1. On average, the expected trajectory of reported physical health will decline over two years.

H2. Higher reports of avoidant and anxious attachment will be linked with higher reports of concurrent depressive symptoms.

H3. Higher reports of depressive symptoms will be linked with lower initial levels as well as poorer trajectories of physical health over two years.

H4. Depressive symptoms will mediate the associations between anxious and avoidant attachment with physical health trajectories.

# Chapter 4 - Method

**Participants and Procedures**

The present study used participants from the Flourishing Families Project (FFP), an ongoing longitudinal study evaluating inner processes of 682 families with a child between the age of 10-13 in 2007. These data were made up of randomly selected participants from a northwestern and western city in the United States, who were recruited using a national telephone survey database. Families in the database were randomly identified using census target tracts that paralleled socio-economic and racial stratification reports from the local school districts. Each family was administered assessments in their homes by research assistants annually, and were compensated monetarily for their participation. All procedures were implemented in accordance with the university's institutional review board. For the present analysis years 2009, 2010, and 2011 of the FFP were used, with some demographic information being used from 2007. Data from this sample was chosen because of the large, longitudinal sample that included relevant measures and had a sufficient number of participants with a chronic disease.

**Participants**

To best examine the present study hypotheses regarding adult attachment, depression, and reported physical health among those with a chronic disease, a subset of participants from Year 2009 through Year 2011 of the FFP was used. The sample was primarily restricted in three ways: (1) to those currently in a monogamous romantic relationship (cohabiting or married) across 2009, 2010, 2011 with the same partner; (2) to those who reported a diagnosed chronic disease throughout each of the three waves of data collection; (3) only one individual from each couple was represented in the sample. For those couples where both partners had a diagnosed

chronic disease, one partner was chosen at random to be included in the sample using SPSS's randomization tool (IBM Corp., 2013).

After narrowing the 682 original families to those in a cohabiting or marital relationship in 2009, the sample was further focused to those relationships where at least one partner had a chronic disease. Participants were asked to report health problems that they currently were experiencing. They chose from a lengthy list of common health concerns. Participants were selected if they had indicated a chronic disease that was among the 10 most common forms of death (Heron, 2016) or within the 10 most common chronic conditions in the United States (Ward et al., 2014). This list of potential chronic disease conditions included the following: Alzheimer's, arthritis, asthma, high blood pressure, cancer, cardiovascular problems, chronic bronchitis, diabetes, emphysema, hepatitis, failing kidneys, nephritis, nephrotic syndrome, nephrosis, pulmonary disease, respiratory problems, or stroke. After meeting the study criteria, monogamous relationship across the three waves, at least one partner having at least one of the above listed chronic diseases, and only one participant from each relationship being represented, the present sample consisted of 197 participants representing 197 different relationships.

Of the 197 participants, 52% were male (48% female). Approximately 87% reported their race being European American, 4.6% African American, 2.6% Multi-Ethnic, 2% Asian American, and 1.5% reported other. For total annual household income, 10.2% reported making less than $50,000, 30% reported making $50,000 - $78,999, 28.3% reported making $80,000 – $119,999, and 31.6% reported making $120,000 or more. This sample was well educated with 33.2% having an associate degree or some college and 60.2% having a bachelor's, master's, or advanced degree (JD, PhD, PsyD, etc.). Of the 197 participants, 192 of them were married, while five were cohabiting with their partner. The average relationship length was 20.55 years (*SD* =

5.79). The average number of chronic diseases was 1.26 (*SD* = .59). Please see Table 1 for frequency, average length, and severity of each chronic disease.

 **Measures**

Means and standard deviations of the primary measures of physical health, attachment anxiety, attachment avoidance, and depressive symptoms as well as the 11 control measures (age, gender, household income, exercise behaviors, smoking of tobacco, severity of diagnosed disease, years of diagnosed disease, number of diagnosed diseases, length of relationship, and a spouse/partner also reporting a chronic disease) can be found in Table 2.

**Physical health.** To evaluate the general health of participants over two years, a single-item evaluating general health was used in years 2009, 2010, and 2011. Participants responded to the statement, "My health is excellent," using a 5-point scale ranging from 1 (*definitely false*) to 5 (*definitely true*), with higher scores indicating reports of better general health.

**Attachment.** To evaluate the attachment style of the individual who has the chronic disease with their partner at Year 2009, subscales of attachment anxiety and attachment avoidance from the Revised Experiences in Close Relationships Questionnaire (R-ECR; Fraley, Waller, & Brennan, 2000) were used. Four items represented attachment anxiety with sample questions including, "I often worry that my partner will not want to stay with me," and "I often wish that my partner's feelings for me were as strong as my feelings for him or her." Four items represented attachment avoidance with sample questions including, "I feel comfortable sharing my private thoughts and feelings with my partner," and "I find it difficult to allow myself to depend on my partner." The 7-point response scale for both subscales ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). Two composite scores were created to represent attachment anxiety (α = .89) and attachment avoidance (α = .62). For each attachment style variable, scores

were created through computing the mean of the respective four items, with higher scores indicative of more insecure attachment.

**Depressive symptoms.** Depressive symptoms of the chronically ill individual were assessed at Year 2009 using 11 items from the Center for Epidemiologic Studies-Depression scale (CES-D, Radloff, 1977). Example items included "I felt depressed," "I felt lonely," and "I could not get 'going.'" Participants responded using a 3-point scale ranging from 1 (*never*) to 3 (*most of the time*). Scores were created through computing the mean of the items with higher scores indicating more depressive symptoms ($\alpha = .78$).

**Control Variables**

**Age.** To account for the age of participants at Year 2009, a single item asked respondents to report their age in years at 2007. Since 2007 occurred two years prior to 2009, two years were added to each report of age.

**Gender.** To account for the reported gender of participants, a single item at Year 2007 inquired, "Your gender?" where participants selected male or female. This item was recoded into a dichotomous variable (0 = *male*, 1 = *female*).

**Race.** To account for the reported race of participants, a single item at Year 2007 inquired, "To which race/ethnic group do you belong?" where participants were given the ability to select from a list including European American, African American, Hispanic, Asian American, Other Race, or Multi-Ethnic. This item was recoded into a dichotomous variable (0 = *White,* 1 = *Non-White*).

**Household income.** Household income was accounted for at Year 2009 using one item: "What is your combined (with your partner) annual income?" Participants responded by selecting 1 (*under $20,000 per year*), 2 (*at least $20,000 per year*), 3 (*at least $30,000 per year*),

4 (*at least $40,000 per year*), 5 (*at least $50,000 per year*), 6 (*at least $60,000 per year*), 7 (*at least $70,000 per year*), 8 (*at least $80,000 per year*), 9 (*at least $90,000 per year*), 10 (*at least $100,000 per year*), 11 (*at least $120,000 per year*), or 12 (*$150,000 or more per year*).

**Exercise behaviors.** To account for exercise behaviors of participants at Year 2009, one open-ended item asked, "On average, how many minutes each day do you engage in some form of physical exercise?" Participants responded in number of minutes. Higher minutes reported indicated more time participating in exercise behaviors.

**Smoking of tobacco.** To account for smoking of tobacco by the participant, one item from Year 2009 inquired about their smoking of tobacco behaviors. Participants responded using a 5-point scale including 0 (*none*), 1 (*less than once a week*), 2 (*1 or 2 days a week*), 3 (*3 or 4 days a week*), and 4 (*almost every day*). Higher reports indicated more frequent smoking behaviors.

**Severity of diagnosed disease or condition.** To account for the severity of each of the diagnosed diseases reported by the participant, one item from 2009 asked, "How severe are each of the illnesses you have described above?" Participants responded using a 5-point scale ranging from 1 (*not bad at all*) to 5 (*as bad as it could possibly be*). Higher reports indicated worse severity of the disease or condition. Since participants had the ability to select multiple chronic diseases, the disease that had the highest reported severity was used for this item.

**Years of diagnosed disease.** To account for the amount of time that participants had the diagnosed disease, one item from 2009 was asked, "How many years have you had each condition?" Participants reported in number of years. Since participants had the ability to select multiple chronic diseases, the disease that had the highest number of reported years was used for this item.

**Number of diagnosed illnesses.** To account for participants that reported numerous diagnosed chronic diseases, one item was asked at Year 2009 regarding when participants reported their specific chronic diagnosis or diagnoses. They could select between one and seven diagnoses. To account for those participants that had more than one diagnosis, a new variable was created that indicated the number of diagnoses reported by the participant.

**Length of relationship.** To account for the length of time participants have been with their spouse/partner at Year 2009, one item asked, "If you are in a relationship/marriage currently, how many years have you been together?" Participants responded to the open-ended item in years.

**Partner reporting a chronic disease.** To account for a participant's partner also having a chronic disease at Year 2009, one item asked about each participant's partner's present health concerns. They chose from a lengthy list of common health concerns. If they indicated a chronic disease among the 10 most common forms of death (Heron, 2016) or within the 10 most common chronic conditions in the United States (Ward et al., 2014) they were considered having a chronic disease. This list of potential chronic disease conditions included the following: Alzheimer's, arthritis, asthma, high blood pressure, cancer, cardiovascular problems, chronic bronchitis, diabetes, emphysema, hepatitis, failing kidneys, nephritis, nephrotic syndrome, nephrosis, pulmonary disease, respiratory problems, or stroke. This item was recoded into a dichotomous variable (0 = *partner does not have chronic disease*, 1 = *partner does have chronic disease*).

**Analytic Plan**

These hypotheses were tested through two models, both using Mplus version 7 (Muthén & Muthén, 2016). First, for the initial hypothesis examining trajectories of physical health for

individuals that have a diagnosis of at least one chronic disease, an unconditional latent growth curve was modeled. This analysis identified the initial mean levels of reported physical health (i.e., intercept) as well as the mean rate of change (i.e., slope) of physical health across three waves (e.g., declining, static, or improving). Further, this analysis assessed the amount of variation in the initial level and the rate of change of physical health. The slope was scaled where one unit of time corresponds to one year.

Next, for hypotheses two through four, predictors of the initial level of physical health and the rate of change in physical health will be entered. Specifically, depressive symptoms and attachment were entered as predictors to this growth model (see Figure 2). Anxious attachment and avoidant attachment will be entered as predictors of depressive symptoms, and in turn depressive symptoms will be entered as a predictor of the initial level and rate of change in physical health. An indirect effect from avoidant attachment and anxious attachment through depressive symptoms to the intercept and slope of physical health will be assessed by using 2,000 bootstraps within the model. A significant indirect effect will be indicated when the 95% confidence intervals of the bootstrapped indirect effect do not include zero. Significant indirect findings, indicate the association of attachment and reports of physical health are explained through depressive symptoms. Both direct and indirect effects will be tested simultaneously. These associations will be tested while controlling for severity of disease, length of disease, number of diagnoses, physical exercise, smoking tobacco, household income, length of relationship with partner, race, age, and whether their partner also had a chronic disease. Full information maximum likelihood was used to estimate these models and account for missing data.

# Chapter 5 – Results

Frequency, length, and severity of specific diseases can be found in Table 1. Mean and standard deviation of all variables can be found in Table 2. Bivariate correlations of primary variables can be found in Table 3. Two latent growth analyses were used to evaluate the proposed four hypotheses: first, for H1 an unconditional growth model of physical health and second, a conditional growth model with direct and indirect effects predicting the initial level and rate of change in physical health to test H2-H4.

To best examine the average trajectory of reported physical health over two-years and three waves of those with at least one chronic disease, an unconditional latent growth analysis was modeled as a linear rate of change. This model solely evaluated initial reports as well as trajectories of physical health without predictors or controls. This model had good model fit to the data [$\chi2$ (1) = .30, $p$ > .05; RMSEA = .00, 90% CI (.00, .16); CFI = 1.00; SRMR = .01] (Hu & Bentler, 1999). Results from this unconditional model indicated relatively high initial reports of physical health, on average, at 3.92 (range 1 – 5). Further, as expected, on average participants' physical health declined .06 units per year from 2009 to 2011 ($p$ < .05). Variability in initial levels of physical health were significant ($p$ < .001), whereas there was not significant variation in the rates of change among participants.

To examine hypotheses two, three, and four, a mediated latent growth analysis was modeled. Predictor and control variables were then added to this linear growth model of physical health. This conditional model had acceptable model fit to the data [$\chi2$ (15) = 30.00, $p$ < .05; RMSEA = .08, 90% CI (.03, .11); CFI = .96; SRMR = .02] (Hu & Bentler, 1999).

In partial support of hypothesis two, results indicated a significant and positive link between anxious attachment and depressive symptoms ($b$ = .06, $p$ < .01; $\beta$ = .25). Specifically, a

one standard deviation unit increase in attachment anxiety was linked with a .25 standard deviation unit increase in depressive symptoms. Results did not indicate a significant link between attachment avoidance and depressive symptoms.

In partial support of hypothesis three, results indicated a significant and negative link between depressive symptoms and initial levels of physical health ($b = -1.06$, $p < .01$; $\beta = -.33$) but a significant and positive link with trajectories of physical health over two years ($b = .34$, $p < .05$; $\beta = .43$). Specifically, a one standard deviation unit increase in depressive symptoms was linked with a .33 standard deviation unit decrease in initial levels of physical health. Further, a one standard deviation unit increase in depressive symptoms was linked with a .43 standard deviation unit increase of physical health over two years.

In partial support of hypothesis four, results indicated a significant indirect link between attachment anxiety with initial reports of physical health, through depressive symptoms ($b = -.06$, 95% CI [-.15, -.02]; $\beta = -.08$). Direct and positive links of attachment anxiety with initial reports of physical health were approaching significant ($b = .13$, $p = .06$; $\beta = .17$). Indirect links between attachment anxiety with the trajectory of physical health reports, through depression, were also significant ($b = .02$, 95% CI [.003, .05]; $\beta = .11$). No significant direct or indirect links, through depressive symptoms, for attachment avoidance with initial levels and trajectories of physical health were found in the present model. Both the intercept ($R^2 = .29$, $p < .001$) and slope ($R^2 = .30$, $p < .001$) in the conditional model explained a significant portion of the variance in reports of physical health. Depressive symptoms also explained a significant portion of variance in reports of physical health, $R^2 = .27$ ($p < .001$).

Among control variables, the number of reported chronic diseases was significantly linked with depressive symptoms ($b = .11$, $p < .01$; $\beta = .20$) indicating a positive association in

which as number of chronic diseases increased, so did reports of depressive symptoms. Further, reports of household income were also linked with initial reports of physical health ($b = .06, p < .05; \beta = .17$), indicating a positive association; as household income increased, reports of physical health also increased. Reports of a participant's partner also having a chronic disease was significantly linked with lower initial reported levels of physical health ($b = -.16, p < .01; \beta = -.26$). Lastly, the higher number of reported chronic diseases was linked with significantly steeper declines in physical health across two years ($b = -.17, p < .05; \beta = -.40$).

## Robustness Test

To examine consistency and quality of these results, robustness tests were employed with three conditional models identical to the present study's primary latent growth analysis, but with differing combinations of control variables. The first model included none of the above control variables but only the primary variables of physical health (Year 2009-2011), depressive symptoms (Year 2009), attachment avoidance (Year 2009), and attachment anxiety (Year 2009). This model illustrated adequate model fit [$\chi2$ (4) = 8.77$, p > .05$; RMSEA = .08, 90% CI (.00, .15); CFI = .98; SRMR = .03]. Results mirrored the primary finding's pattern of significance, illustrating significant positive links between attachment avoidance and anxiety with depressive symptoms. Attachment anxiety was not significantly linked with initial levels of physical health, but attachment avoidance and depressive symptoms were both negatively linked with initial levels of physical health. Attachment anxiety, attachment avoidance, nor depressive symptoms were directly or indirectly linked with trajectories of physical health.

The second model included only demographic control variables of household income, relationship length, gender, race, and age with the primary variables. This model illustrated adequate model fit [$\chi2$ (9) = 13.76$, p > .05$; RMSEA = .05, 90% CI (.00, .11); CFI = .98; SRMR

= .02]. Results of this model partially mirrored the primary model's results indicating a significant positive link between attachment anxiety and depressive symptoms. Further, results illustrated a significant negative link between depressive symptoms and initial levels of physical health, however, attachment anxiety had a significant positive link with the initial levels of physical health. Attachment anxiety, attachment avoidance, nor depressive symptoms were significantly linked with trajectories of physical health. However, results indicated a significant and negative indirect effect from attachment anxiety to initial levels of physical health, through depressive symptoms.

The third robustness test examined a model of the primary variables with only control variables related to the participant's chronic disease including number of diseases, number of years with the chronic disease, and the severity of the chronic disease. Model fit was adequate [$\chi2$ (7) = 11.44, $p$ > .05; RMSEA = .06, 90% CI (.00, .12); CFI = .99; SRMR = .02]. Results partially mirrored that of the primary model and indicated significant positive links of attachment avoidance and attachment anxiety with depressive symptoms. Further, results indicated a negative link between depressive symptoms and attachment anxiety with initial levels of physical health. Depressive symptoms were positively linked with physical health trajectories while attachment anxiety was negatively linked with trajectories of physical health. Further, results indicated several significant indirect effects including negative links from attachment avoidance and attachment anxiety with initial levels of physical health through depressive symptoms. Also, significant indirect effects also indicated positive links with attachment anxiety and attachment avoidance with trajectories of physical health, through depressive symptoms.

While these three robustness tests which offer model results with different combinations of control variables included or excluded although offer parallels to the primary findings of the

present study, they also offer differences worth noting. First, tests indicated significant links between attachment avoidance with other variables including depressive symptoms and initial levels of physical health when none of the control variables were present. Second, tests indicated that hinging on the control variables used, there are differing positive and negative links of depressive symptoms and attachment anxiety with physical health. Paired with the primary study's findings, these three robustness tests emphasize the importance of future research to replicate and further examine adult attachment, depressive symptoms, and physical health. This replication will assist in better understanding how the primary variables interact with one another as well as with other systemic control variables such as demographics and chronic disease characteristics.

# Chapter 6 - Discussion

The current study aim was to examine the possible role of adult attachment in reported physical health trajectories among those with a chronic disease. Specifically, we sought to determine whether depressive symptoms would mediate the associations between anxious and avoidant attachment with physical health trajectories over two years. We found that physical health symptoms significantly declined across these two years, on average in this sample of those with a chronic illness. However, this average rate of change in physical health symptoms was a function of several key predictors. Results suggested that as depressive symptoms increased, initial levels of physical health decreased. However, higher depressive symptoms predicted a significant upward shift in the expected trajectory of improved physical health across two years. Further, higher attachment anxiety was associated with higher depressive symptoms. Higher attachment anxiety's link with initial levels of better physical health was also approaching significance. An indirect effect was identified from attachment anxiety to depressive symptoms to initial levels of physical health. A second indirect effect was identified from attachment anxiety to depressive symptoms to trajectories of physical health across two years.

Prior to full application to these results both academically and practically, it is important to emphasize the need for replication of them in future studies. Because the present study is one of the first to examine adult attachment and its link with physical health outcomes among a sample of those with a chronic disease, more research is needed to validate these results. Although a substantial amount of research has examined other elements of relationships with physical health outcomes (Tay et al., 2012; Uchino, 2006), minimal research has evaluated adult attachment and physical health outcomes (Maunder & Hunter, 2001). The present study seeks to

only begin to address this gap, while also recognizing the vital need for additional research to replicate and extend the results prior to more fully suggesting research and clinical implications.

Attachment theory posits that secure, intimate and trusting, relationships may bolster resilience during trying or stressful events (Bowlby, 1988), yet minimal research has evaluated how attachment relates to physical health among those that have a chronic disease (Kowal et al., 2003; Maunder & Hunter, 2001). Previous research has suggested that those with more secure attachment relationships fare better with their mental health (Cooper et al., 1998; Lopez & Brennan, 2000; Wei et al., 2005). Present findings echo previous research that a more securely attached relationship with one's partner is associated with lower mental health concerns as demonstrated in direct links between higher attachment anxiety and more depressive symptoms. Specifically, feeling less secure that one's partner is there for them is linked with that chronically ill partner feeling more depressed.

Interestingly, higher attachment anxiety was approaching significance levels in its association with better reports of initial physical health. Although we did not directly test this possibility, we can speculate that those who are anxiously pre-occupied with their relationship may be likewise anxiously pre-occupied with their health. They may also be more proactive in following medical suggestions from their physicians. Another possibility is that those with higher attachment anxiety are frequently making overt bids to their partner to help meet their needs, and that this seeking after reassurance and support from a partner may be helpful in actually improving their physical health. This does not align with previous research and theory suggesting that insecure attachment relationships are generally associated with poorer outcomes (Armitage & Harris, 2006; Wei et al., 2005). Rather, this finding may offer a different dimension of attachment anxiety and physical health among those with a chronic disease. With a defining

characteristic of attachment anxiety within adult relationships being worrying about being abandoned by their partner (Hazen & Shaver, 1987), an individual who has a chronic disease may over-exaggerate their physical health. Previous research suggests a strong link between physical health and relationship satisfaction and stability (Uchino, 2006). Those with a chronic disease and anxiously attached may claim that their physical health is improving as a function to possibly reduce the burden that a chronic disease may have on a relationship. This in turn may assist in maintaining their relationship with their partner and reducing the potential risk of being abandoned, a large fear of those that are anxiously attached.

The current results indicated that higher reports of depressive symptoms were linked with lower initial levels of physical health, yet linked with better reports of physical health trajectories across two years. This partially corroborates previous research which has linked poor mental health conditions, such as higher rates of depressive symptoms, with poorer physical health (Lett et al., 2004; Nouwen et al., 2010). Interestingly, reports of physical health trajectories improving across two years was associated with higher depressive symptoms. This was an unexpected finding and does not align with previous research (Clarke & Currie, 2009). We can speculate that higher depressive symptoms may be a byproduct of people taking their diagnosis and chronic condition seriously, and understand and accept the implications of their condition. This acceptance of fate, so to speak, may be similarly associated with both depression and changes in physical health. We were not able to control for the level of accepting the chronic condition rather than denying it as a part of the participant's life, which would have helped us further examine these potential nuances in the data.

Results from the current study suggest indirect links of higher reports of attachment anxiety, through depressive symptoms, with decreases in initial reports of physical health. This

aligns with previous research that suggests couples' relationships are linked with physical health outcomes through psychological functioning or experiences, such as depression (Tay et al., 2012). Our study extends prior research by offering a new element of romantic relationships, adult attachment, in explaining links with physical health among those with a chronic disease. With previous research indicating that less secure attachment relationships are associated with more mental health concerns (Bifulco et al., 2002) and physical health concerns (Armitage & Harris, 2006), this study adds to this body of research by expanding what is known about these processes in a sample of chronically ill participants.

**Clinical Implications**

Findings from the present study furthers discussions of the role that clinicians have with modifiable risk factors that may be linked with physical health. Our results identified adult attachment and depressive symptoms as salient factors to consider when thinking systemically about an adult with a chronic disease. First, our results suggest that decreasing attachment anxiety within an adult relationship where a chronic disease is present may help reduce depressive symptoms. Reductions in depressive symptoms could then be a potential bridge to altering physical health symptoms (Clarke & Currie, 2009; Moussavi et al., 2007). However, we did not find a consistent association with depressive symptoms and physical health. Based on our results, it may be that improved depressive symptoms may improve physical health in the short-term, but may hurt physical health in the long-term. Future research needs to further clarify this apparent contradiction prior to having confidence in making clinical suggestions about the potential ramifications of improved depressive symptoms on the long-term health consequences of those with a chronic illness.

Second, the present study illustrates links between facets of adult attachment, specifically attachment anxiety, and reports of initial physical health as well as indirect links, through depressive symptoms, with trajectories of physical health across two years. This echoes previous research and theory that physical health is not simply biological in nature but rather is constructed of complex and nuanced processes and characteristics of an individual and their broader system (i.e., relationships; Tay et al., 2012; Uchino, 2006). This is of particular importance to medical professionals who can encourage those with a chronic disease to seek relational and mental health professionals to attend to these broader systemic factors of depressive symptoms and attachment within their relationships. This supplemental treatment may provide other avenues to support and improve their patient's physical health.

The present study also suggests that adult attachment may be important for clinicians and other helping professionals to consider while treating individuals and couples where chronic disease is present. Specifically, results predominantly indicate that higher reports of attachment anxiety may be linked to reports of physical health in such a manner that betters physical health initially and over time. As discussed earlier, this finding may illustrate an attempt of the anxiously attached individual to reduce the burden of their chronic disease on their relationship by over exaggerating their health and thus reducing the possibility of being abandoned by their partner. Introducing and processing this possibility with clients may be an important approach to employ to ensure that anxiously attached individuals are not burying or hiding personal difficulties, such as struggles with physical health, merely to keep the relationship intact. Emotionally Focused Therapy (EFT), a clinical approach to addressing adult attachment, provides a strong framework for providing an environment in which a relationship may have vulnerable discussions such as these (see Johnson, 2004). Future research is needed to further

explore anxious attachment and its unique link with both self-reports of physical health and medical evaluations of physical health. Research that evaluates both may offer more insight into how anxious attachment is related to physical health. In short, the present study indicates the importance of clinicians and other helping professionals to be keenly aware of depressive symptoms and attachment styles within adults with a chronic disease to continually assess how to best address them to result in optimal physical health outcomes.

**Limitations and Future Direction**

Notwithstanding the present study's strengths, there are several limitations that must be accounted for when understanding and interpreting these findings. First, with the present study one of the first to evaluate longitudinal links between reports of adult attachment, depressive symptoms, and physical health among a sample with a chronic disease, it is important for further analysis and replication of the current findings prior to making strong conclusions and clinical recommendations. This replication may be most beneficial using both the present study's full measurement of adult attachment (R-ECR; Fraley, Waller, & Brennan, 2000) and depressive symptoms (CES-D; Radloff, 1977) as well as other validated measures of adult attachment (e.g., The Brief Accessibility, Responsiveness, and Engagement Scale (BARE); Sandberg, Busby, Johnson, & Yoshida, 2012) and depressive symptoms (e.g., Beck Depression Inventory (BDI); Beck, Steer, & Brown, 1996). Having alternate forms of measurement would be helpful due to lower Cronbach's alpha scores for attachment avoidance ($\alpha$ = .62) and depressive symptoms ($\alpha$ = .78) in the present study. Other measures with greater reliability may better capture and consistently illustrate the possible links between adult attachment, depressive symptoms, and physical health among those with a chronic disease.

Another limitation to be considered when considering these results is the data from the limited sample used in this study were collected through participants' self-reports of attachment, depressive symptoms, physical health, and various controls. Physical health, for example, was examined through a single item that did not include labs, professional reports, medical screenings, and so forth; rather it was a perception of their physical health through responding on a Likert-like agreement scale. Further, it would be important to move beyond a single-item measurement of physical health but rather one that includes multiple dimensions or characteristics of one overall physical health. Diagnosed chronic diseases were also self-reported rather than gathered through a medical process that would provide evidence of the diagnosis. Future research needs to implement medical documentation of the diagnoses of chronic diseases as well as multiple-item measures that evaluate actual, rather than perceived only, reports of physical health.

Finally, it is important to consider when interpreting this study that there were varying chronic diagnoses and severities of diseases that constructed the present study's sample. For example, when referring to a chronic disease, some participants were referring to cancer where others were referring to arthritis. The nature of research on chronic illness includes substantive variation in symptom severity. This was partially adjusted for due to including symptom severity as a control variable. Using larger samples, future research needs to identify specific diseases and track how they evolve over time and in what ways relationships are linked to that evolution. This type of future research could offer more detailed understanding and guidance to individuals and helping professionals encountering specific diseases. The present study's sample is quite homogenous in that it was close to 90% White, middle aged or older, included household incomes greater than $50,000, well educated, and only came from two different cities in the

United States. With chronic disease being prevalent across the United States (Ward et al., 2014), it is vital for future researchers to better reflect the diverse racial, social, and economic strata within the country. This greater diversity in future studies will assist clinicians and helping professionals in providing best practices to more of their diverse clientele rather than a select few.

Future research needs to continue to examine broader systemic factors such as relationships and their link with physical heath among those that have been diagnosed with a chronic disease. This needs to be done with multi-year longitudinal studies that best capture how physical health and intimate relationships co-evolve with chronic disease. To best offer guidance to helping professionals working with those individuals and couples where chronic disease is present, clinical trials could be done that specifically examine how focusing on attachment within relationships and how they may covary with physical health across several years. In short, future research needs to continue to evaluate chronic disease and physical health through a systemic lens that considers facets of romantic relationships such as attachment.

**Conclusion**

Answering the call of Kowal and colleagues (2003) for more research evaluating the link between attachment and physical health, the present study sought to understand how adult attachment and depressive symptoms are linked to initial reports of physical health and trajectories of physical health. Through a mediated latent growth analysis of 197 individuals with a chronic disease, we found that attachment anxiety and depressive symptoms have unique links with initial levels and trajectories of physical that need further exploration. These results have important clinical implications for helping professionals by identifying modifiable covariates linked with physical health across time among those who have been diagnosed with a chronic

disease. Future research is needed to elucidate links between attachment, mental health, and physical health across time.

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| Social Relations | Psychological Functioning | Physical Health |
|---|---|---|

**Social Relations**
- Social Support
- Adult Attachment

**Psychological Functioning**
- Depression

**Physical Health**
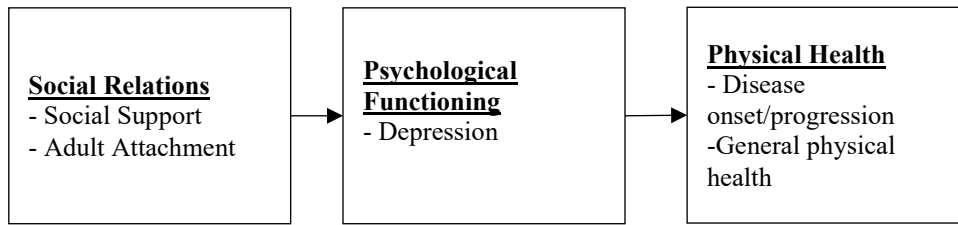- Disease onset/progression
-General physical health

Figure 1. Adapted model of Tay et al.'s (2012) synthesis of research explaining pathways from social relations to physical health outcomes offering the theoretical foundation for the present study.
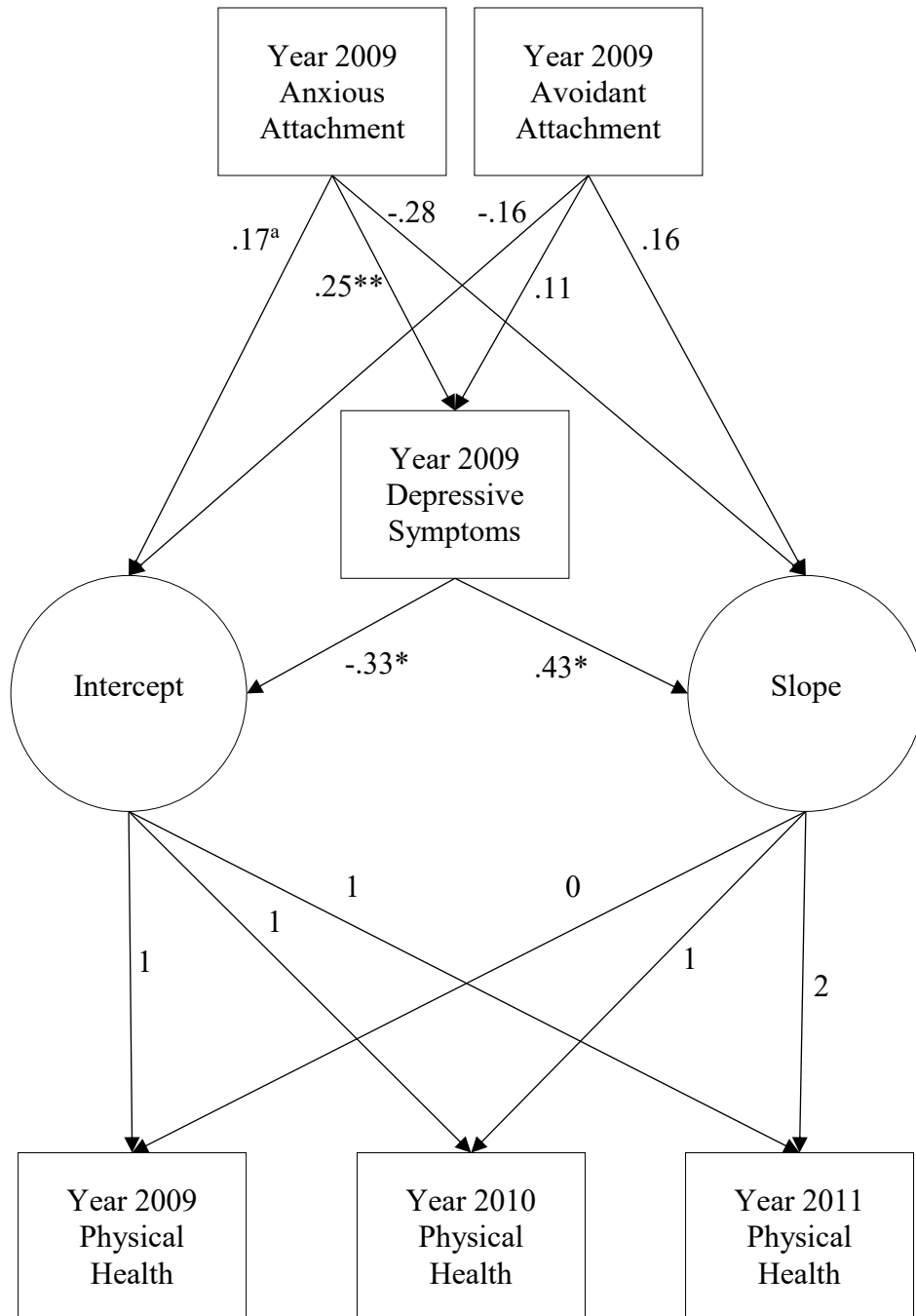
Figure 2. Standardized results of the latent growth curve model assessing trajectories of reports of physical health of individuals with a chronic disease across two years. Reports of avoidant and anxious attachment are entered as predictors of depressive symptoms, and depressive symptoms is entered as a predictor of the initial level of physical health (intercept) and the rate of change in physical health (slope). Control variables are entered as predictors of depressive symptoms as well as intercept and slope of physical health, including severity of disease, length of disease, number of diagnoses, physical exercise, smoking tobacco, household income, length of relationship with partner, race, age, and whether their partner also had a chronic disease.
[a]$p < .10$. *$p < .05$. **$p < .01$.

Table 1. Reported Chronic Diseases: Frequency, Mean Years of Diagnosis, and Mean Severity of Diagnosis ($N = 197$)

| Chronic Disease | Frequency | Mean Years | *SD* | Mean Severity (1 – 5) | *SD* |
|---|---|---|---|---|---|
| Arthritis | 72 | 10.25 | 15.93 | 2.07 | .76 |
| Asthma | 42 | 20.70 | 15.93 | 1.93 | .64 |
| Cancer | 11 | 5.14 | 4.92 | 2.55 | 1.13 |
| Cardiovascular problems | 17 | 8.53 | 12.51 | 2.06 | .75 |
| Diabetes | 25 | 7.01 | 5.89 | 2.40 | 1.04 |
| High blood pressure | 72 | 6.58 | 6.18 | 2.04 | .83 |
| Respiratory problems | 10 | 12.39 | 12.92 | 2.40 | .84 |

Table 2. Descriptive Statistics for Primary and Control Variables ($N = 197$)

| Variables | $M$ | $SD$ | Range | $\alpha$ |
|---|---|---|---|---|
| Physical health Year 2009 | 3.93 | 1.00 | 1 – 5 | |
| Physical health Year 2010 | 3.85 | .96 | 1 – 5 | |
| Physical health Year 2011 | 3.82 | .98 | 1 – 5 | |
| Attachment anxiety | 2.09 | 1.22 | 1 – 7 | .89 |
| Attachment avoidance | 2.49 | 1.09 | 1 – 7 | .62 |
| Depressive symptoms | 1.38 | .28 | 1 – 3 | .78 |
| Control Variables | | | | |
| Age | 46.87 | 6.23 | 32 – 64 | |
| Female[a] | 47.7% | | 0 – 1 | |
| White[b] | 87.2% | | 0 – 1 | |
| Annual household income | 8.43 | 2.80 | 1 – 12 | |
| Exercise behaviors | 43.78 | 45.78 | 0 – 300 | |
| Smoking of tobacco | .16 | .75 | 0 – 4 | |
| Severity of diagnosed disease | 2.14 | .81 | 1 – 3 | |
| Years of diagnosed disease | 11.57 | 11.99 | 1 – 5 | |
| Number of diagnosed diseases | 1.26 | .59 | 1 – 5 | |
| Length of relationship | 20.55 | 5.79 | 1 – 44 | |
| Partner with disease[c] | 18.8% | | 0 – 1 | |

[a]Female: 0 = *male*, 1 = *female*. White: 0 = *White*, 1 = *Non-White*. [c]Partner with disease: 0 = *partner does not have disease*, 1 = *partner does have disease*.

Table 3. Correlations among Primary Variables ($N = 197$)

| Variables | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Physical Health 2009 | – | | | | | |
| 2. Physical Health 2010 | .75** | – | | | | |
| 3. Physical Health 2011 | .65** | .63** | – | | | |
| 4. Depressive Symptoms | -.26** | -.18* | -.21* | – | | |
| 5. Attachment Avoidance | -.20** | -.08 | -.12 | .24** | – | |
| 6. Attachment Anxiety | -.01 | -.08 | -.01 | .32** | .40** | – |

*$p < .05$.  **$p < .01$ (two-tailed).