

“Dismissingness always matters”: An examination of tobacco smoking, frequency
of visits to healthcare providers, and trust in the provider as potential mediators
between attachment style dismissingness and diabetes health status

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“DISMISSINGNESS ALWAYS MATTERS”: AN EXAMINATION OF
TOBACCO SMOKING, FREQUENCY OF VISITS TO HEALTHCARE
PROVIDERS, AND TRUST IN THE PROVIDER AS POTENTIAL
MEDIATORS BETWEEN ATTACHMENT STYLE DISMISSINGNESS AND
DIABETES HEALTH STATUS

by

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ABSTRACT

Background: Attachment theory describes highly stable patterns of responses to threats, known as attachment styles, that previous research indicates affect diabetes health outcomes differentially. Multiple studies reported associations between the dismissing attachment style and worse diabetes health outcomes (e.g., increased HbA1c, higher rates of tobacco smoking, and worse adherence to exercise, foot care, glucose monitoring, and medication regimens). Some evidence also suggests that the patient-provider relationship mediates these pathways. This thesis sought to evaluate relationships between attachment style dismissingness, a diabetes health outcome (i.e., HbA1c), and three potential mediators that constitute maladaptive coping behaviors and/or indicators of the patient-provider relationship: tobacco smoking, the frequency of visits to a primary care provider, and trust in the primary healthcare provider, in a low SES sample of type 2 diabetics from a safety-net hospital setting in Seattle, Washington. It hypothesized that higher levels of attachment style dismissingness predict higher levels of

HbA1c, in addition to more cigarette smoking, inadequate visits to primary care providers, and a lack of trust in the primary healthcare provider, and also that each potential mediator predicts higher HbA1c. The associated literature review and discussion section critically appraise the extant research on attachment theory and diabetes, and delineate some of its implications for the practices of clinical medicine and public health. **Methods:** The study included in this thesis constructed its hypotheses *a priori*, and tested them using regression analyses, in a subsample of 178 type 2 diabetic adults who presented with no missing data for any of the study's variables. The participants derived from a sample of diabetic patients who sought medical care at the Adult Medicine and Family Medicine clinics of Harborview Medical Center—a safety-net health care organization serving low-income and uninsured people in Seattle, Washington. **Results:** Statistical analyses revealed non-significant trends in the expected directions for most of the hypotheses evaluated by this thesis. One significant finding indicated that a lack of trust, among participants, in their primary healthcare providers consociated with worse diabetes health statuses (i.e., higher HbA1c). An observed association between attachment style dismissingness and cigarette smoking, while statistically non-significant, occurred in the direction opposite to that hypothesized by this study. **Conclusions:** Trust in the primary healthcare provider promotes better diabetes health, relative to the diabetes health outcomes of individuals who lack trust in their primary healthcare providers. Attachment style dismissingness may be associated with higher levels of HbA1c, inadequate visits to primary care providers, and lower trust in primary healthcare providers, although the coefficients that corresponded to the regression analyses that tested these hypotheses in the current study failed to reach statistical significance.

DEDICATION

I would like to express my deepest appreciation to the members of my thesis committee—for their passions, wisdom, dedications, and patience, as well as for their enduring commitments to reciprocally empowering and challenging me. I would also like to thank Dr. Paul Ciechanowski, who provided both the data set for this study and the inspiration for this thesis. Finally, I would like to dedicate this thesis to my husband, whose unwavering support made the pursuit of a graduate education possible for me.

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EXECUTIVE SUMMARY

Genetic research shows that modifiable or mutable risk factors dominate in determinations of absolute risks for type 2 diabetes and/or diabetes complications (Lango, et al., 2008; van Hoek, et al., 2008; Langenberg, et al., 2014), and yet type 2 diabetes affects approximately 8.8% of the U.S. population (CDC, 2014a), while diabetes constitutes the seventh leading cause of death in the U.S (CDC, 2013). These findings underscore the importance of developing and implementing diabetes interventions that target the associated health behaviors, even as experts consider the disease as one of the most psychologically and behaviorally demanding of chronic medical illnesses to treat (Ciechanowski, Katon, Russo, & Walker, 2001). Recently, some researchers advanced attachment theory as a framework for understanding interpersonal aspects of diabetes health. The results of their studies implicate novel opportunities for designing interventions that aim to modify individuals' diabetes health behaviors, and they promise to meaningfully inform health professionals' evaluations of their patients' risks for diabetes or diabetes complications.

Attachment theory describes a developmentally important psychobiological system that motivates humans to seek proximity to significant others in times of need (Ein-Dor, Mikulincer, & Shaver, 2011). During infancy, experiences of seeking proximity to care providers agglomerate to give rise to attachment styles—certain patterns of expectations, needs, emotions, and social behaviors—that remain largely stable throughout the life course (Fraley & Shaver, 2000; Mikulincer & Shaver, 2007). Consistently warm and responsive care-giving engenders a secure attachment style, which enables the affected individual to comfortably rely on others, or on themselves, in resolving impending threats. Inconsistently responsive care-giving promotes

the developments of preoccupied attachment styles. Preoccupied individuals exhibit strong needs for proximity to others, and tendencies towards over-dependence on others, as well as low levels of self-efficacy (Maunder & Hunter, 2012b). Consistently unresponsive and insensitive caregiving begets fearful and dismissing attachment styles, which cause the affected individuals to distance themselves from their care providers (who represent their attachment figures). These and many other aspects of attachment styles carry the potential to affect health outcomes (including diabetes health outcomes), differentially.

Attachment styles play key roles in determining how individuals cope with threats. A secure attachment style facilitates constructive coping, as it enables the affected individual to cognitively reappraise threats, mobilize support from others who possess additional resources, maintain a level of self-confidence needed to integrate and act on new information, and develop the flexibility required to accommodate changing circumstances as they arise (Mikulincer & Shaver, 2007; Kobak & Sceery, 1988; Solomon, et al., 1998). Individuals with preoccupied, dismissing, or fearful attachment styles (collectively referred to as insecure attachment styles), who variously lack such capacities, are more likely to resort to maladaptive strategies for coping with threats that include illicit drug use, alcohol abuse, tobacco smoking, and over-eating (Maunder & Hunter, 2001; Mikulincer & Shaver, 2007; McWilliams & Bailey, 2010). These behaviors potentially affect diabetes health adversely. Research extensively shows that the ways in which individuals with illnesses, or at-risk of illnesses, cope with stressors in their lives can importantly influence their physical and psychological health outcomes (Glanz & Schwartz, 2008; Turan, et al., 2002; Lazarus & Folkman, 1984), directly (as in the adverse health effects of stress, given inadequate coping) and/or indirectly (e.g., by modifying treatment adherence or encouraging substance abuse). Some studies indicate that coping styles significantly affect

glycemic control and overall health in patients with diabetes (Collins, Bradley, O'Sullivan, & Perry, 2009; Lundman & Norberg, 1993; Duangdao & Roesch, 2008; Kent, et al., 2010; Huang, et al., 2015).

Attachment styles theoretically influence healthcare utilization patterns, consistent with the notion that they instigate certain support-seeking behaviors. Health researchers suggest that dismissing and fearful individuals minimize their contact with their healthcare providers, and that members of the latter category routinely downplay their symptoms and the severities of their illnesses (Thompson & Ciechanowski, 2002; Hunter & Maunder, 2001; Maunder & Hunter, 2009; Ciechanowski, Katon, Russo, & Dwight-Johnson, 2002). Several studies support these hypotheses. For example, Ciechanowski, et al., 2002 found that primary care patients with preoccupied attachment styles sustained the highest costs and healthcare utilization levels, while patients with fearful attachment styles sustained the lowest, and Ciechanowski, et al. (2006a) reported that dismissing and fearful individuals missed more scheduled office visits than their securely attached counterparts. Likewise, Feeney and Ryan (1994) found an inverse relationship between avoidant (i.e., fearful and dismissing) attachment and healthcare visits, while Consedine, et al. found that attachment style dismissingness predicted less frequent prostate cancer screening amid older black men (Consedine, Tuck, & Fiori, 2013).

Healthcare utilization behaviors sometimes affect the quality of healthcare that individuals receive from their providers, and the natures of their health outcomes. More frequent visits yield more opportunities for appropriate treatment intensification, and they also promote greater patient compliance (e.g., Patel, Crimson, Miller, & Johnsrud, 2005; Fontil, et al., 2015; Slinin, et al., 2012; Mentari, et al., 2005). In diabetics, Karter, et al. (2004) found an association between higher rates of missed appointments and poorer glycemic control. Some experts consider the act

of receiving care from other people as a major coping activity (Wilcox & Vernberg, 1985; Sherbourne & Stewart), whereupon the avoidance of care providers can be construed as a type of avoidance coping. At the same time, healthcare researchers prodigiously argue that attachment styles dictate the degrees to which individuals habitually trust other people, including their healthcare providers, and they posit that attachment style differences in dispositions to trust impel inter-individual differences as to the frequencies of visits to primary care providers (e.g., Ciechanowski & Katon, 2006; Ciechanowski, et al., 2006a). It follows that visit frequency represents both a behavioral indicator of trust and a coping behavior, purportedly conditioned on attachment style and, at the same time, determinative of diabetes health.

With regards to attachment style dispositions towards trust, dismissing and fearful individuals theoretically, and empirically, harbor lower levels of trust in their attachment figures as compared to secure and preoccupied individuals (e.g., Bartholomew & Horowitz, 1991). Elsewhere, research shows that trust in the provider matters for patients' managements of both chronic and acute diseases, including diabetes. Patients seek out care as a function of their trust in their providers (e.g., Rolfe, et al., 2014; Jones, et al., 2012); Whether or not patients trust their providers potentially predicts whether they fill their prescriptions, comply with their treatment recommendations, and/or accept their medical diagnoses (Polinski, et al., 2014; Berry, et al., 2008; Ratanowongsa, et al., 2013; Freedman, 2003; Sharf, Stelljes, & Gordon, 2005; Hillen, et al., 2014; Figg, et al., 2010; Thom, Ribisl, Stewart, & Luke, 1999; Safran, et al., 1998). Consistent with such expostulations, two studies reported significant associations between lower trust in physicians and fewer attempts to lose weight (Jones, et al., 2012) or exercise (Safran, et al., 2004), and other studies' researchers found that patients who trusted their physicians enjoyed stronger self-efficacy and higher health outcome expectations (Lee & Lin, 2009), as well as

perceiving less difficulty with completing their diabetes-related care activities (Bonds, et al., 2004). Moreover, trust appears to affect one's willingness to disclose important health information (Calnan & Rowe, 2004; Vrennan, et al., 2013; Lee & Lin, 2009), while the ability of a provider to treat a given illness often depends on the quality of information that their patients provide them with.

This thesis aims to evaluate the nature of relationships between attachment style, cigarette smoking (as a maladaptive coping behavior), visit frequency, trust in the provider, and glycated hemoglobin (as an indicator of diabetes health) in a low SES sample of type 2 diabetics who sought care at the Harborview Medical Center (a safety-net hospital located in Seattle, Washington) between the months of September 2007 and March 2008. It capitalizes on existing research regarding attachment theory and diabetes health, which consistently indicates that the dismissing attachment style relates to worse diabetes health outcomes (Ciechanowski, et al., 2001; Ciechanowski, Hirsch, & Katon, 2003; Turan, Osar, Turan, Ilkova, & Damci, 2003; Ciechanowski, et al., 2004; Ciechanowski, et al., 2002; Ciechanowski & Katon, 2006; Morse, Katon, Ciechanowski, & Hirsch, 2006; Ciechanowski, et al., 2010; Ciechanowski, et al., 2006a). This thesis' hypotheses construe all participants' attachment styles in terms of their severities of attachment style dismissingness. This approach proffers an opportunity to extend the research that pertains to the apparent relationships between worse diabetes health outcomes and a dismissing attachment style, while it recognizes the view that attachment theorists promulgate, in which individuals manifest blends of attachment styles rather than conforming to singular attachment style prototypes (Griffin & Bartholomew, 1994; Ciechanowski, et al., 2003).

Despite the consistency of findings from extant research on diabetes and attachment style, the contemporary studies contain many limitations. The current thesis critically reviews such studies

and discusses their limitations, as a means of formulating recommendations for future research and justifying the methods adopted by its concurrent study. Attachment theory and diabetes studies' limitations include issues that arise from samples that combine type 1 and type 2 diabetics, usages of subjectively defined cut-points and data-driven approaches to selecting covariates, tests of hypotheses on different sub-samples (due to unaddressed missing data), multiple comparisons, and adjustments on comorbidity indices that incorporate downstream diabetes complications.

The current thesis hypothesized an association between more severe dismissingness and higher HbA1c, and conceptualized increased levels of cigarette smoking, inadequate visit frequency, and a lack of trust in one's provider as potential mediators that operated in this pathway. It conducted regression analyses to evaluate the relationships between the exposure (attachment style dismissingness) and the outcome (HbA1c), the exposure and each of the potential mediators, and the potential mediators and the outcome. The results revealed non-significant trends in the expected directions for most of this study's hypotheses, including increasing levels of HbA1c with increasing levels of attachment style dismissingness. One statistically significant finding provided evidence of an association between low levels of trust in the primary healthcare provider and worse diabetes health (i.e., higher HbA1c). Given the considerable evidence linking attachment styles to divergent and distinctive dispositions to trust, this finding suggests a pathway through which attachment styles may impact diabetes health.

Further research is needed to definitively establish associations between attachment styles and diabetes health outcomes, and to qualify the nature of each relationship. To the extent that such relationships exist, attachment style interventions promise to enable healthcare providers to understand their patients better, communicate with them more effectively, and tailor treatment

recommendations to their individual patients' particular needs and preferences (e.g., Maunder & Hunter, 2009; Ciechanowski, 2007; Schmidt, et al., 2002; Hooper, et al., 2012; Ciechanowski, et al., 2006). In the arena of public health, attachment theory principles requisition interventions among expectant mothers, infants, and/or young children to reduce the long-term population incidences of preventable chronic diseases, such as diabetes, hypertension, cardiovascular disease, and depression (Shonkoff, 2012; Shonkoff, et al., 2012; Mercy & Saul, 2009). Significant work remains to substantiate the purported linkages between attachment styles and chronic disease outcomes (including diabetes outcomes), and even more so to develop effective and ethical attachment theory interventions for applications in clinical medicine and public health.

“Dismissingness always matters”: An examination of tobacco smoking, frequency of visits to healthcare providers, and trust in the provider as potential mediators between attachment style dismissingness and diabetes health status

CHAPTER 1 – INTRODUCTION

Twenty-nine point one million children and adults in the United States, or 9.3% of the population, are estimated to have diabetes, with type 2 diabetes comprising approximately 95% of these cases (CDC, 2014a). If current trends continue, as many as 1 in 3 U.S. adults could have diabetes by 2050 (CDC, 2011). In 2007 the national cost of diabetes exceeded \$174 billion; put another way, approximately 1 in 10 health care dollars spent in the U.S. is attributed to diabetes (American Diabetes Association, 2008). Meanwhile, the World Health Organization estimates that ~347 million people worldwide were suffering from diabetes in 2008, which equates to 9.5% of the adult population (Danaei, et al., 2011; Forbes & Cooper, 2013) and, with the incidence of diabetes rapidly increasing, experts suggest that this number may double by 2030 (Forbes & Cooper, 2013). As it stands, the incidence of the disease increased by over 50% across the last 10 years (Danaei, et al., 2011), which establishes diabetes as “a major epidemic of this century” (Forbes & Cooper, 2013). Recently, Ann Albright, PhD, RD, director of CDC’s Division of Diabetes Translation, announced that such estimates “are alarming numbers that show how critical it is to change the course of type 2 diabetes,” and noted that “[s]uccessful programs to improve lifestyle choices on healthy eating and physical activity must be made more widely

available, because the stakes are too high and the personal toll too devastating to fail" (CDC, 2010).

Diabetes is a chronic and progressive disease that requires continuing medical care and ongoing patient self-management to prevent acute complications and to reduce the risk of long-term complications (ADA, 2012a). Many diabetes-related complications are debilitating and costly, including heart disease, stroke, hypertension, blindness, retinopathy, kidney disease, nervous system disease, amputations and dental disease, as well as increased susceptibility to many other illnesses, such as depression, influenza and pneumonia (Centers for Disease Control and Prevention, 2012). Overall, the risk for death among people with diabetes is about twice that of people of similar age without diabetes, and average medical expenditures are 2.3 times higher than what they would be in the absence of the disease, thus placing substantial burdens on diabetic patients themselves (Centers for Disease Control and Prevention, 2012).

More than a decade ago, the US Diabetes Prevention Program clinical trial demonstrated that structured lifestyle interventions, such as training people with pre-diabetes to achieve modest weight loss through diet and exercise, reduced diabetes incidence by 58 percent. Yet, translating this knowledge into improved clinical practice guidelines, or effective public health or policy interventions, remains a challenge. During 2007-2010, an estimated 12.9% of U.S. adults with self-reported diabetes exhibited poor glycemic control (Ali, Echouffo-Tcheugui, & Williamson, 2012)—a condition associated with more common or more severe diabetes complications (Ali, Bullard, Imperatore, Barker, & Gregg, 2012). Two realities stand in the way of reducing the incidence of diabetes in the United States. The first is a fragmented health care system with complex financing (ADA, 2016; Ali, et al., 2012), and the second involves challenges inherent in implementing and maintaining behavioral interventions (Ali, et al., 2012).

Diabetes is considered one of the most psychologically and behaviorally demanding of chronic medical illnesses to treat, with 95% of diabetes management conducted by the patients themselves (Ciechanowski, Katon, Russo, & Walker, 2001). Not only must diabetic patients continually rely on, and collaborate with health care providers, but they must also engage in a number of key health-promoting behaviors, including modifications to diet and exercise, adherence to medication regimens, and the frequent monitoring of blood-glucose levels and signs of complications. Success in these endeavors depends on coping effectively with stressors, which include the long-term management of a chronic disease, but also on establishing and maintaining good therapeutic alliances with health care providers (Thompson & Ciechanowski, 2002; Ciechanowski, et al., 2001). Multifactorial risk-reduction strategies that include ongoing patient self-management, continuous medical care, education, and support are all critical to preventing acute complications and reducing the risk of long-term complications from type 2 diabetes (ADA, 2015).

The complex nature of diabetes care has mobilized researchers across a variety of disciplines to produce a rich and sprawling body of evidence that supports a wide range of interventions with potential to improve diabetes outcomes. Recently, several researchers applied a novel theory, called attachment theory, to understanding interpersonal aspects of the health problems and care-seeking behaviors that diabetic and other patients demonstrate (e.g., Ciechanowski, Sullivan, Jensen, Romano, & Summers, 2003). In brief, attachment theory explains the nature of an individual's tie to her or his caregivers and the impact of that bond on their subsequent adjustments throughout the life course (Fraley, Vicary, Roisman, & Brumbaugh, 2011). It emphasizes the role of early life experiences in shaping purportedly stable

dispositions towards interpersonal relationships, and strategies for engaging in emotion regulation.

Primary care physicians recently began considering the usefulness of attachment theory as a guide for providing effective medical care to their patients in medical settings (Hooper, et al., 2012; Bifulco, 2002; Bifulco, Jacobs, Bunn, Thomas, & Irving, 2008; Ciechanowski, et al., 2001; Ciechanowski, et al., 2006; Ciechanowski, et al., 2001; Ciechanowski, 2010; Maunder & Hunter, 2009). The motivation for this derives from the idea that attachment theory promises to help clinicians better understand and respond to the ways in which their patients describe and discuss their symptomologies, and form interpersonal relationships with their significant others, including their health care providers (Hooper, Tomek, & Newman, 2012; Levy, Ellison, Scott, & Bernecker, 2011; Ciechanowski, 2007). Studies show evidence of linkages between attachment style and specific diseases, health presentation, communication, relationships with providers, illness behaviors, and functioning (Ciechanowski, 2007; Ciechanowski, 2010; Feeney, 2000). Understanding the nature of these associations promises to meaningfully inform the practice of clinical medicine, in its service of improving patients' health outcomes, satisfactions with their care, treatment adherence levels, and patient-physician relationships (Hooper, et al., 2012; Arbuthnott & Sharpe, 2009; Feeney, 2000; Hunter & Maunder, 2001; Maunder & Hunter, 2008; McWilliams & Bailey, 2010; Miller, 2008; Ciechanowski, et al., 2006; Ciechanowski, 2007; Ciechanowski, 2010).

Attachment theory describes a developmentally important psychobiological system that motivates human beings, and many non-human primates, to seek proximity to significant others in times of need (Ein-Dor, Mikulincer, & Shaver, 2011). It adumbrates a particularly powerful paradigm for elucidating health behaviors, given that its principles integrate both coping and

affect regulation as a means of explaining vulnerability and resistance to stressors (including diseases), and individual differences in adaptive flexibility. Within this framework, perceived threats serve to activate the attachment system, and illness events constitute near-perfect triggers for mobilizing attachment behaviors (Maunder & Hunter, 2001; Mikulincer & Shaver, 2007; Schmidt, 2002). Even when included as merely a priming word in psychological experiments, illness incites the activation of participants' attachment systems (Mikulincer, Birnbaum, Woddis, & Nachmias, 2000). Research on attachment theory describes inter-individual differences in patterns of interpersonal behaviors that can affect physical health through their impacts on symptom amplification, health behaviors, stress responses, patient-provider relationships, health care utilization, and access to the beneficial effects of social support (Maunder & Hunter, 2009).

Given the intricate array of relationships, promulgated by research, between attachment system components and indicators of physical health or illness, attachment theory sustains a significant degree of potential for informing the design and implementation of novel health/diabetes interventions in clinical medicine, and in public health. For example, attachment theory research promises to equip health care providers with valuable insights into their patients' preferences for communication and collaboration, as well as their propensities for adopting key health-promoting behaviors or for eliminating certain detrimental health-risk behaviors. On the basis of attachment theory-related information, providers stand to tailor their treatment recommendations in ways that accommodate the personal and particular needs of their individual patients (Maunder & Hunter, 2009; Ciechanowski, Hirsch, & Katon, 2002; Thompson & Ciechanowski, 2002; Hunter & Maunder, 2001; Salmon & Young, 2009). This thesis embarks on an exploration of relationships between an attachment theory construct and diabetes health, and it examines factors that potentially mediate an emergent association. Specifically, it

considers cigarette smoking (as a type of maladaptive coping behavior), trust in the primary healthcare provider (as one dimension of the patient-provider relationship), and the frequency of primary care visits (as an indicator of both maladaptive coping behaviors and patient-provider relationships) with respect to their candidacies as potential mediators in research about relationships between diabetes health and attachment style status.

Figure 1 depicts a concept map that shows the relationships tested by this thesis (designated by the black arrows), along with the most likely relationships that exist amongst the hypothetical mediators, based on the investigator's review of the associated literature (denoted with the orange arrows). Summarily, increased levels of dismissingness in participants' attachment styles predict increased levels of maladaptive coping behaviors (including tobacco smoking), lower frequencies of visits to primary care providers, and poorer patient-provider relationships (as exemplified by lower levels of trust in the primary healthcare provider). Each of these outcomes, in turn, mediates worse diabetes health outcomes, such as higher HbA1c.

Chapter 2 of this thesis reviews the literature associated with its study's tested hypotheses: subsection 2.I. pertains to the classification and pathophysiology of diabetes; subsections 2.II. and 2.III. provide an overview of attachment theory concepts and their measurements, with subpart 2.III.D. delineating the conceptualization and measurement of attachment style in this thesis, and subpart 2.III.E. introducing the instrument that this thesis modeled its attachment style measure after; subsection 2.IV opens with a brief reflection on promises and perils of utilizing attachment theory for guiding clinical healthcare interventions, before it continues on to describe, as well as evaluate, some evidence linking attachment style to health (in general, and specific to diabetes) (subparts 2.IV.B.-2.IV.D). Subsection 2.V. includes a discussion of the literature associated with each of the potential mediators interrogated by this thesis: maladaptive

coping behaviors (via cigarette smoking) (2.V.A), visit frequency (2.V.B.), and trust in the provider (2.V.C.). Following the literature review, Chapter 3 (entitled “Methods”) particularizes the details of this thesis’ study. Chapter 4 contains the results of this study, and Chapter 5 concludes this thesis with a discussion of the study’s results and their implications for the clinical practice of medicine, healthcare policy, and public health research and practice.

CHAPTER 2 - REVIEW OF LITERATURE

I. The diagnosis, classification, pathogenesis, and pharmacological treatment of diabetes mellitus

A. Diagnosis and classification

Diabetes mellitus encompasses a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both (ADA, 2013b). Several sub-classifications of diabetes exist in clinical medicine; despite the definitional clarity that differentiates each type from all other types, physical ambiguities persist, which sometimes render the process of diagnosing the disease precisely, in some patients, difficult and complex. Many diabetic individuals suffer from symptoms that defy easy classification according to the clinical definition of any specific sub-type of the disease (ADA, 2013b). For example, among patients with type 1 diabetes, autoimmune destruction of the β -cells in their pancreata generally causes absolute deficiencies in their respective insulin production capabilities. However, insulin resistance (a clinical characteristic of type 2 diabetes) subsequently develops over time in many type 1 diabetics, in response to their ongoing diabetes treatments (ADA, 2013b). On the other hand, type 2 diabetics' symptoms typically result from some combination of insulin resistance in the hormone's target tissues, and inadequate compensatory insulin secretory responses (ADA, 2013b). Therefore, impaired insulin secretion and defects in insulin action frequently coexist in the same patient, regardless of the underlying cause(s) of their diabetes illness(es). This renders the task of assigning an initial diabetes diagnosis complicated in some patients.

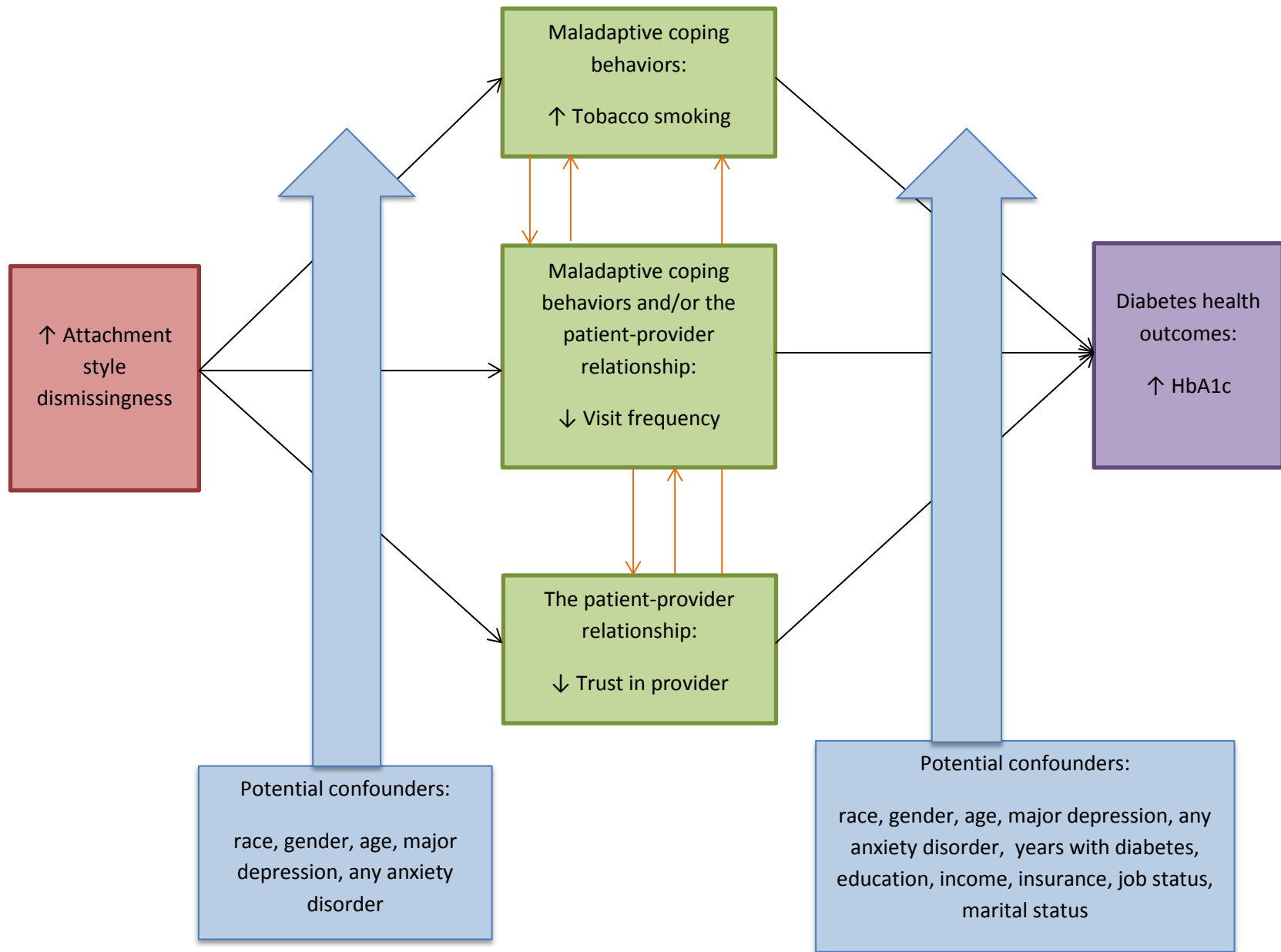


Figure 1: Concept map of mediators between attachment style dismissingness and diabetes health outcomes

Type 1 diabetes most commonly occurs in children and adolescents, but potentially occurs at any age, due to high variability in the precipitating rate of β -cell destruction among affected individuals, which eventualizes rapidly in some people (mainly children) and much more slowly in others (mainly adults) (ADA, 2013b). Genetic risk factors strongly influence the onset and pathogenesis of type 1 diabetes, where genetic research exploring the genetic underpinnings of type 2 diabetes shows only weak associations, at present (Forbes & Cooper, 2013). However, the genetic basis of type 1 diabetes is not fully understood (Forbes & Cooper, 2013). In complicated instances, providing a differential diagnosis of type 1 or type 2 diabetes necessitates an immunoassay test that detects the presence or absence of autoantibodies to the body's islet cells, insulin hormone, GAD65 enzyme, and/or insulin antigens IA-2 and IA-2 β , which all serve as biological markers of the immune destruction of β -cells that characterizes individuals affected primarily by type 1 diabetes (ADA, 2013b).

Among diabetic patients in the United States, approximately 90-95% receives an initial diagnosis of type 2 diabetes mellitus (ADA, 2013b). The remaining 5-10% consists predominantly of type 1 diabetics, and a relatively small proportion of diabetic patients present with illnesses corresponding to one of several other categories of sub-types (ADA, 2013b; ADA, 2015). The variant subtypes include conditions either caused by 1) monogenetic defects in β -cell functioning (a condition referred to as "MODY", or maturity-onset diabetes of the young); 2) genetically determined abnormalities in insulin action, which generally result in mutations of an affected patient's insulin cell receptors; 3) endocrinopathies that cause over-productions of patients' insulin-antagonizing hormones (e.g. cortisol, glucagon, epinephrine, growth hormone); 4) diseases of, or diffuse injuries to, the exocrine pancreas that either directly reduce an individual's β -cell mass, or otherwise affect some element involved their insulin productions; 5)

patients' uses of one of several drugs that impair their insulin secretion processes, potentially precipitating diabetes in patients with pre-existing insulin resistances; 6) infections with a virus that causes β -cell destruction (e.g. adenovirus, coxsackievirus B, or the viruses that cause mumps and congenital rubella); 7) uncommon, immune-mediated decrements in insulin action among some individuals, in relation to certain other autoimmune diseases; 8) one of several genetic syndromes accompanied by increases in incident diabetes (e.g. as a result of the chromosomal abnormalities causing Down syndrome, Klinefelter syndrome, and Turner syndrome); and finally, 9) hormonal changes that occur during pregnancy in some women, leading to a condition commonly known as gestational diabetes (ADA, 2013b; Forbes & Cooper, 2013). The particular type of diabetes diagnosed in any given individual depends, in some instances, on the nature of the circumstances present at the time of diagnosis. For example, consider the case wherein a woman, diagnosed with gestational diabetes during her pregnancy, continues to present with hyperglycemia long after her delivery, up to a point in time after which her healthcare provider primarily considers her as having a diagnosis of type 2 diabetes (ADA, 2013b). Ideally, though, the nature and the severity of a patient's diabetes symptoms at any given time play a far greater role in determining which specific recommendations their healthcare provider decides to include among the elements of their diabetes treatment plan (ADA, 2013b).

B. The pathogenesis and pharmacological treatment of type 2 diabetes

There are many known causes of type 2 diabetes in affected individuals (ADA, 2012b). Risk factors for the disease include age, race, ethnicity, having a family history of type 2 diabetes, being overweight, having high blood pressure, having low HDL (high density lipid) levels, and

pregnancy, as well as high levels of physical inactivity, poor diet, genetic abnormalities, and a history of major depression or one of several other mental illnesses (ADA, 2012b; ADA, 2012a; ADA 2015; ADA, 2013b; Katon, et al., 2009). Approximately 80% of type 2 diabetics are overweight or obese (National Institutes of Health, 2015), and evidence suggests that obesity itself causes insulin resistance, through its effects on various elements involved in one or more of several complex physiological processes (ADA, 2012b; ADA, 2015). However, the nature of the connection between obesity and insulin sensitivity remains largely unknown (National Institutes of Health, 2015).

In type 2 diabetes, peripheral insulin resistance and compensatory hypersecretion of insulin from the pancreatic islet cells may precede the decline in islet secretory function (Forbes & Cooper, 2013). In all cases, a progressive resistance to insulin influences the onset and evolution of type 2 diabetes, and affected individuals generally suffer from relative, rather than absolute, insulin deficiencies (ADA, 2013a). This means that the amount of insulin produced by each individual's pancreatic β -cells remains disproportionately low, relative to the amount required by their body to prevent the symptoms of diabetes (Inzucchi, et al., 2012). Many type 2 diabetic individuals produce normal or high levels of insulin in absolute terms, especially in the initial stages of their disease, but they continue on to develop more severe or irreversible levels of diabetes due to low insulin sensitivities with a variety of causes, such as an increasing inability of the β -cells of the pancreas to release adequate insulin in phase with rising glycemia (Inzucchi, 2012). Insulin resistance and functional islet-cell incompetence both increase over time, and pancreatic α -cells hypersecrete glucagon, which further promotes hepatic glucose production that contributes to the rise in diabetes symptoms (Nauck, 2011). In type 2 diabetics the severities of associated metabolic abnormalities can progress, regress, or stay the same,

depending on the degrees of control that individuals exercise over contributing factors over time (ADA, 2013a).

The chronic hyperglycemia that typifies diabetes is associated with long-term damage, dysfunction, and failure of different organs in the body—especially the eyes, kidneys, nerves, heart, and blood vessels (ADA, 2013a). It leads to damage of the blood vessels, which contributes to wide-ranging complications categorized as either “macrovascular disease” or “microvascular disease” (Forbes & Cooper, 2013). Microvascular complications include eye disease, or retinopathy, kidney disease (nephropathy), and neural damage (neuropathy), while major macrovascular complications include accelerated cardiovascular disease resulting in myocardial infarction, and cerebrovascular disease manifesting as strokes (Forbes & Cooper, 2013). Other chronic complications of diabetes include depression (Nouwen, et al., 2011), dementia (Cukierman, Gerstein, & Williamson, 2005), and sexual dysfunction (Adeniyi, Adeleye, & Adeniyi, 2011).

The most effective way to reduce risk for vascular complications in both type 1 and type 2 diabetes is through achieving optimal glycemic control, with the goal of reaching normoglycemia (normal blood glucose levels) as early as possible in the course of the disease (Forbes & Cooper, 2013; Diabetes Control and Complications Trial Research Group, 1993). However, in the case of type 2 diabetes, the recent ADVANCE and ACCORD studies showed that more intensive glycemic control does not necessarily reduce the risk of cardiovascular disease (Forbes & Cooper, 2013; ADVANCE Collaborative Group, et al., 2008). Health care providers utilize numerous agents to control hyperglycemia in type 2 diabetics, including insulin-sensitizing agents such as thiazolidinediones and metformin, agents which stimulate insulin secretion from the pancreas (e.g., sulfonylureas), glucagon-like peptide-1 agonists, and

dipeptidyl peptidase-IV inhibitors (Forbes & Cooper, 2013). However, the natural progression of type 2 diabetes suggests that 60% of individuals with the disease eventually require insulin treatment to optimally control their blood glucose levels (Wright, Burden, Paisey, Cull & Holmann, 2002; Nam, Chesla, Stotts, Kroon & Janson, 2011).

Though important, hyperglycemia is not the only major factor effecting diabetes complications (For a comprehensive review of the mechanisms that mediate diabetes complications, refer to Forbes & Cooper, 2013). Obesity, *per se*, exacerbates the development of diabetes complications, due to the concomitant abnormalities seen in nutrient and calorie overload, insulin sensitivity, and secretion, in addition to a lack of physical activity, which all likely contribute to vascular complications (Forbes & Cooper, 2013; DeBlock, DeLeeuw, & Van Gaal, 2005; Yitalo, Sowers, & Heeringa, 2011). Dyslipidemia (elevated plasma triglycerides and LDL cholesterol, in the context of decreased HDL cholesterol) and hypertension also contribute to cardiovascular and non-cardiovascular complications (Forbes & Cooper, ADA, 2013a). Consequently, the appropriate management of diabetes involves taking steps to control hyperglycemia, obesity, hyperlipidemia, and hypertension in concert (Forbes & Cooper, 2013; ADA, 2013a). Achieving such an end necessitates collaborating with health care providers and adhering to treatment recommendations on a regular basis. Attachment theory interventions aim to facilitate both of these tasks in diabetic patients.

C. Genetic risk factors for type 2 diabetes and related complications

Genetic risk factors appear to play a small role in type 2 diabetes risk, and a somewhat larger role in the developments of diabetes complications among affected individuals. Several genetic studies found that the *combined effects* of all known, or highly ranked, single nucleotide polymorphisms (SNPs) from loci that reached genome-wide significance for type 2 diabetes in

prior genome-wide association studies (GWAS) (i.e., all known or highly ranked genetic risk factors for type 2 diabetes) failed to improve, or only marginally improved, researchers' predictions of type 2 diabetes beyond their inclusions of the classical risk factors in their statistical models (Lango, et al., 2008; van Hoek, et al., 2008; Langenberg, et al., 2014; Buijsse, Simmons, Griffen & Schulze, 2011; Lyssenko, et al., 2008; Meigs, et al., 2008; Talmud, et al., 2010; Bao, et al., 2013; Mühlenbruch, Jeppesen, Joost, Boeing, & Schulze, 2013). While they effectively showed that information on common genetic variants associated with the risk of type 2 diabetes offers little improvement in the way of type 2 diabetes risk prediction over and above already well-established risk factors (e.g., sex, age, family history, BMI, physical activity), such studies focused mainly on the incremental value of genetic testing for disease prediction (Langenberg, et al., 2014). Another avenue for genetic research in type 2 diabetes risk involves elucidating the effects of interactions between genetic susceptibilities and lifestyle behaviors (Langenberg, et al., 2014). Researchers in a nested case-cohort genetic study recently evaluated hypotheses of this type, using a composite score (as in the studies that this paragraph cited previously) for genetic risk of type diabetes, which summed the effects of all highly ranked risk alleles in European-descent populations (i.e., 49 variants, in total) (Langenberg, et al., 2014). Their findings revealed significant interactions between the genetic risk score, and the age of onset for type 2 diabetes, or participants' outcomes on measures of obesity (i.e., BMI and waist circumference), indicating significantly greater effects of genetic risk in younger and leaner individuals (Langenberg, et al., 2014). In other words, genetic risk more strongly predicted type 2 diabetes in participants with younger ages at diabetes onset (<50 years; 60-60 years; ≥60 years), and leaner body compositions (BMI [normal weight; overweight; obese] and narrower waist circumferences (WC) [low, medium, high]) (Langenberg, et al., 2014). Yet, researchers'

findings, in this study, support the argument that mutable threats most often affect individuals' risks of type 2 diabetes. Stratified analyses of absolute risks among participants showed that the 10-year cumulative incidence of type 2 diabetes increased from 0.25% to 0.89% across extreme genetic risk quartiles in normal weight individuals, while a much larger increase (4.22% to 7.99%) occurred in obese individuals across the extremes of their genetic risk quartiles (Langenberg, et al., 2014). The high levels of absolute risk associated with obesity at every level of (relative) genetic risk highlights the importance of interventions aimed toward reducing BMI/WC, but simultaneously, the attenuation of genetic risks' effects with increasing body mass/WC demonstrates that the modifiable, or *mutable*, risk factors dominate participants' absolute risks of type 2 diabetes (Langenber, et al., 2014).

Genetic variants likely influence individuals' risks of developing certain complications from type 2 diabetes (Doria, 2010; Farbstein & Levy, 2010; CDC, 2014b; Doria, et al., 2008). In the United States, approximately 1 in 500 individuals inherit familial hypercholesterolemia—a genetic disorder which causes high levels of LDL, beginning at birth (CDC, 2014b). Several studies indicate that polymorphisms at specific genetic loci potentially increase individuals' risks of developing cardiovascular disease (CVD) in the setting of diabetes mellitus (DM) (Farbstein & Levy, 2010). The majority of polymorphisms identified by such studies fail to show significance when tested across various populations, likely as a result of linkage disequilibrium with other genetic markers that directly alter disease progression, resulting in SNP-disease associations not preserved in all populations, or which are subject to the effects of population stratification (Farbstein & Levy, 2010). However, a few polymorphisms, identified by low throughput candidate gene studies and high throughput GWAS, currently show promise as predictors of risk for certain diabetes complications or targets for genotype-driven

pharmaceutical treatments, which maximize benefits or minimize side-effects (Doria, 2010; Farbstein & Levy, 2010). In a number of studies, researchers found associations between a gene coding for aldose reductase (*AKR1B1*)—an enzyme that catalyzes the reduction of carbonyl-containing compounds to their respective alcohols—and diabetic retinopathy, diabetic nephropathy, and cardiovascular events (Ko, Lam, Wat & Chung, 1995; Heesom, Hibbard, Millward & Demaine, 1997; Abhary, Hewitt, Burdon & Craig, 2009; Doria, 2010). Researchers demonstrated associations between genetic variants at the *ELMO1* locus and diabetic nephropathy in Japanese, African-American, and Caucasian populations (Shimazaki, et al., 2005; Pezzolesi, et al., 2009; Leak, et al., 2009), and Tong, et al. identified associations between a SNP in the gene coding for erythropoietin (a cytokine that promotes red blood cell production and new blood vessel formation), and a combined phenotype of retinopathy/end-stage renal disease in diabetic individuals (Tong, et al., 2008). A meta-analysis of studies on an intronic SNP in the gene for adiponectin (rs1501299)—a cytokine with insulin-sensitizing effects, produced exclusively by adipocytes—and coronary artery disease (CAD) found the SNP significantly associated with a two-fold increase in CAD risk among diabetic subjects (Qi, et al., 2006). Genetic researchers identified several SNPs associated with relatively small increases in cardiovascular risk (allelic odds ratios mostly below 1.20, and not exceeding 1.30), and some associated with larger increases in cardiovascular risk (e.g., OR, 1.82; 95% CI: 1.57-2.12) (Doria, 2010).

Nascent research on interactions between diabetes and risk alleles for diabetes complications shows stronger effect sizes for certain genotypes. For example, a polymorphism on chromosome 9p21 predisposes individuals in the general population to coronary artery disease (OR, 1.45; 95% CI: 0.94-2.22 in heterozygotes, and OR, 2.37; 95% CI: 1.52-3.70 in

homozygotes) (Doria, 2010; Helgadóttir, et al., 2007; McPherson, et al., 2007), but appears to produce significantly larger effects in the presence of poor glycemic control among type 2 diabetics homozygous for the genotype (OR, 3.77; 95% CI: 2.13-6.70) (Doria, et al., 2008; Doria, 2010). Researchers indicated that a 36% 10-year cardiovascular mortality rate characterized homozygotes for the risk allele with a history of poor glycemic control, compared to only 15-20% for all other subjects (Doria, et al., 2008). This finding hints at the potential for common risk alleles with small effect sizes to improve prediction algorithms for diabetes complications, when applied synergistically with other risk factors.

The potential for genetic research to improve risk prediction for diabetes complications remains obscured, at present, with GWAS not exploited to their full potential and structural variations such as copy-number variants, insertions, deletions, and duplications largely unexplored (Doria, 2010; Feuk, Carson & Scherer, 2006). In the absence of such knowledge, genetic variation appears to contribute meaningfully to the risk of certain diabetes complications in some individuals, to some extent. However, positive changes in mutable lifestyle behaviors unequivocally decrease the risk of many type 2 diabetes complications in most affected individuals (e.g., Gaede, Lund-Andersen, Parving & Pedersen, 2008; Danaei, et al., 2009; CDC, 2012; Danaei Stumvoll, Goldstein & van Haeften, 2005; ADA, 2012a; ADA, 2013a; LeRoith, 2002). Overall, research indicates that type 2 diabetics possess a great deal of control, albeit incomplete, over the onset and progression of their disease and its associated complications (e.g., Danaei, et al., 2009).

II. An introduction to key concepts in attachment theory

A. Key concepts

Attachment theory is a lifespan developmental theory that sets forth a framework for studying individual differences in interpersonal functioning, amid close relationships, and in processes of emotion regulation (Picardi, et al., 2013; Mikulincer & Shaver, 2007). It posits an evolutionarily based system, the attachment system, designed for the purpose of ensuring that infants maintain sufficient proximity to their caregivers during times of threat (McWilliams & Bailey, 2010). Certain processes and elements perpetuate stability in the system, extending its purview into adulthood (refer to subparts 2.II.B. and 2.V.C.i.-iii.b. for discussions on attachment style stability). Essentially, humans form dispositions for achieving and conserving intimate relationships necessary to their survivals during infancy, and integral to their maintenance of optimal health from childhood to old age. These affectional ties constitute *attachment bonds* that flow in only one direction. That is, the bonds form not between two people, but within a single person to another individual who they perceive as stronger and wiser (Cassidy, 2008). Consequently, they describe characteristics that “[entail] representation in the internal organization of the individual” (Cassidy, 2008; Thompson & Raikes, 2003). Infants and children form multiple attachment bonds with such caregivers, who represent their *attachment figures*—most notably with their parents or primary caregivers during infancy (Cassidy, 2008). Any relationship in which proximity to an other affects felt security represents an attachment relationship (Maunder & Hunter, 2001; West & Sheldon-Kellor, 1994). Thus, the relationship that exists between an individual who perceives some illness that affects them as threatening, and their doctor/healthcare provider, constitutes an attachment relationship in which the

doctor/healthcare provider represents a secondary attachment figure (Maunder, Panzer, Viljoen, Owen, Human, & Hunter, 2006).

Infants, children, and adults regularly engage in *attachment behaviors* that promote (or avoid) proximity to their attachment figures—the primary goal of the *attachment behavioral system*. For example, non-mobile infants cry and reach out to their mothers for contact, and mobile children achieve the same goal by shuffling, crawling, walking, or running to their mothers (Cassidy, 2008; Bowlby, 1969; Bowlby, 1982). Such behaviors are organized by the attachment behavioral system in cognitive representations/structures designated as *working models* (Cassidy, 2008; Mikulincer & Shaver, 2007). Working models serve to integrate and consolidate information from experiences in interpersonal interactions with attachment figures, and they form the basis for individuals' *attachment styles*. Attachment styles correspond to patterns of expectations, needs, emotions, and social behaviors that result from a particular history of attachment experiences, usually beginning in relationships with parents (Fraley & Shaver, 2000; Mikulincer & Shaver, 2007). They are dynamic and complex structures that contain a more powerful affective component than most other social schemas (e.g., social cognitive theory) (Mikulincer & Shaver, 2007). Attachment theorists recognize that working models distort individuals' perceptions of social reality, but also respond to relevant experiences and involve defenses in addition to perceptions, and evolve, most powerfully, from experiences that fall beyond the reach of memories (Mikulincer & Shaver, 2007).

Attachment styles particularize individual differences in affect regulation and perceptions of beliefs about the self and close others (This thesis identifies and describes several specific attachment styles throughout its literature review, including in subparts 2.III.A. and 2.III.E.) (Picardi, et al., 2013; Mikulincer & Shaver, 2003; Bartholomew & Horowitz, 1991; Maunder &

Hunter, 2001). An *attachment style orientation* or *profile* reflects the ordering of attachment styles within a given individual, by their relative degrees of severity, or by their proportions of influence over an individual's manifest attachment style behaviors (Bartholomew, 2015; Bartholomew, Kwong, & Hart, 2001). In other words, attachment style orientations encapsulate the particular blend of attachment styles that comprise an individual's interpersonal relationship style.

B. The stability of attachment style

Many prominent attachment theorists regard substantial, and increasing, stability in attachment styles across the life course as constituting a basic premise of attachment theory (Fraley, Vicary, Brumbaugh, & Roisman, 2011; Scharfe & Bartholomew, 1994; Fraley, 2002; Fraley, Roisman, Booth-LaForce, Owen, & Holland, 2011; Bartholomew, et al., 2001). Moreover, this idea comprises a core assumption of most attachment theory researchers in the fields of health and medicine (i.e., Ciechanowski, et al., 2004; Ciechanowski, et al., 2010; Armitage & Harris, 2006; Hunter & Maunder, 2001; Consedine, Tuck, & Fiori, 2013; Davis, et al., 2014; Maunder & Hunter, 2008). Bowlby conceptualized attachment theory as a model of social and emotional development with life-long applicability (Meredith, Ownsworth, & Strong, 2008; Magai, 2008; Mikulincer & Shaver, 2007; Van Assche, Luyten, Bruffaerts, Persoons, van de Ven, & Vandenbulcke, 2013; Sbarra & Hazen, 2008; Bartholomew, et al., 2001; Bowlby, 1980), but he stopped short of defining precisely which attachment theory constructs, or measures of constructs, applied at various stages of development across the life course (Magai, 2008). This assumption (of high stability), however, represents one facet of attachment theory responsible for its notable popularity among researchers of developmental, social, and personality psychology (Fraley, et al., 2011).

Some evidence supports the view that attachment style constitutes a well-formed personality trait (Hunter & Maunder, 2001), largely resistant to change across a variety of relationships and/or over long periods of time (e.g., Hamilton, 2000; Weinfield, Sroufe, & Egeland, 2000; Fraley, 2002; Klohnen & Bera, 1998), and a considerable body of evidence indicates that attachment style constructs remain highly stable over shorter periods of time (e.g., 8, 12, or 18 months, 4.5 years) (e.g., Bartholomew & Scharfe, 1994; Vaughn, Egeland, Sroufe, & Waters, 1979; Bar-Haim, Sutton, Fox, & Marvin, 2000). Yet, enough inconsistencies mottle the landscape of empirical research on the stabilities of adult attachment styles so as to preclude strong conclusions (Mikulincer & Shaver, 2007; Magai, 2008). Individual studies indicate that the attachment systems of some adults change, in either their organizations or their functioning (Mikulincer & Shaver, 2007). This potentially reflects true instability in attachment styles over time, but alternatively reflects instability in the measures used to evaluate attachment style status, or else some combination of instabilities from both and/or other sources (Scharfe & Bartholomew, 1994; Mikulincer & Shaver, 2007). Many studies' results merely indicate moderate stabilities in their attachment style constructs, or high stabilities in their attachment style constructs attenuated by low reliabilities of their attachment style measures, rather than indicating the degrees of stability characteristic of attachment style patterns, themselves (Scharfe & Bartholomew, 1994).

In several longitudinal studies that measured infants' attachment styles—first using Ainsworth's Strange Situation protocol, and later using the Adult Attachment Interview's (AAI's) interview-based procedure—researchers reported moderate to high degrees of continuity in participants' attachment style statuses, over periods of time that ranged from weeks and months to years and decades, especially in the absence of major life events (e.g., Fraley, 2002;

Hammond & Fletcher, 1991; Shaver & Brennan, 1992; Waters, 1978; Thompson, Lamb, & Estes, 1982; Egeland & Sroufe, 1981; Vaughn, Egeland, Sroufe, & Waters, 1979; Iwaniec & Sneddon, 2001). For example, Hamilton (2000) found that, in a sample of children followed from birth (investigators recruited their mothers during the third trimester of pregnancy), 77% of participants retained the same secure/insecure attachment style status at the age of 12, and 63% of the participants retained their infant attachment style classifications in a 3-way comparison (i.e., secure, anxious, and avoidant attachment styles). In a 2002 meta-analysis of studies that measured attachment styles longitudinally, with the Strange Situation and AAI protocols, Fraley concluded that attachment styles demonstrated a moderate degree of continuity over a period of time ranging from infancy to young adulthood (Fraley, 2002; Mikulincer & Shaver, 2007). Additionally, Roisman, et al. (2005) concluded that significant continuity characterized attachment styles, based on participants' performances on the Strange Situation protocol and the Close Relationship Interview (another interview-based measure of attachment style status).

Regarding the stability of *adult* attachment styles (i.e., those relating to periods of time that both began and ended with a measure of participants' attachment styles during their adult years), researchers in one retrospective longitudinal cohort study found that their participants' attachment styles exhibited moderate to high stability over periods of time ranging from 1 week to 25 years (Klohnen & Bera, 1998; Mikulincer & Shaver, 2007). However, the procedure for the study involved comparing women's scores on a self-report attachment style measure administered during the 52nd year of their lives to their attachment style statuses, as derived from their responses to checklists of adjectives that researchers presented to them at earlier time points in the study (i.e., at ages 27 and 43). In another study, Scharfe and Bartholomew (1994) reported a moderate degree of stability in adults' attachment styles over a period of 8 months, which they

estimated to represent a very high degree of “true stability” after they accounted for the unreliabilities of their attachment style measures. Several researchers in other studies suggested that their own, or others’, adult attachment style measures exhibited moderately high levels of test-retest correlations over periods of time similar to that evaluated by Scharfe and Bartholomew (1994) (e.g., Collins & Read, 1990; Crowell & Treboux, 1995; Bartholomew, 1990; Bartholomew & Horowitz, 1991). Consistent with attachment theory, Fraley and Brumbaugh also concluded—on the basis of a meta-analysis—that adult attachment styles correlated with significantly higher degrees of stability compared to attachment styles evaluated across the life course, beginning in infancy and extending into young adulthood. This finding colludes with Bowlby’s contention that attachment styles decrease in their liabilities over the life course (Bowlby, 1973; Mikulincer & Shaver, 2007; Dykas & Cassidy, 2011; Main, Kaplan, & Cassidy, 1985; Bartholomew, et al., 2001).

In studies of young adults, attachment style distributions appear similar to those found in studies of infants and children, with about 55-65% presenting as secure, 22-33% as avoidant, and 15-20% as ambivalent (Magai, 2008). However, according to several studies, the dismissing attachment style appears at higher frequencies in older adult populations (e.g., 40%, 31%, or 52%), and the preoccupied attachment style appears at lower frequencies (e.g., 8.5%, 4%, or 6%), compared to the distributions of attachment styles in younger adult populations (Magai, 2008; Van Assche, et al., 2013; Roisman, Fraley, & Belsky, 2007; Soerensen, Webster, & Roggman, 2002; Magai, Cohen, Milburn, Thorpe, McPherson, & Peralta, 2001). In terms of attachment style dimensions, the authors of one study that evaluated 86,555 adult (aged 18-71) internet respondents found that the highest levels of attachment anxiety occurred in younger adults, while lower levels appeared in middle and older aged adults (Chopik, Edelstein, & Fraley,

2013). Attachment avoidance, on the other hand, peaked among middle-aged adults and comprised relatively lower proportions of younger and older adult participants, but varied less dramatically, over all, than the distribution of attachment anxiety between participants' age groups (Chopik, et al., 2013). In fact, Magai (2008) concluded that attachment style distributions appeared to not only differ, but to differ distinctly, between older and younger study participants.

The age trends described above, perhaps, say little about attachment styles' stabilities throughout adulthood. Alternative explanations include the presence of a birth cohort effect, whereby differences in attachment style distributions between age groups potentially reflect differences in early life exposures to historical challenges or predominant childrearing norms (Magai, 2008). Developmentally emergent themes in late adulthood also plausibly shift the emphases that individuals place on attachment style characteristics which existing measures tend to capture. That is, measures designed for evaluating attachment styles in children might fail to ascertain the attachment styles of older adults with the same degree of accuracy (Magai, 2008; Van Assche, et al., 2013; Segal, Needham, & Collidge, 2009). For example, measures that too heavily emphasize the preference for autonomy and independence facet of the dismissing attachment style potentially conflate developmentally normative trends in aging with actual changes of attachment style, as many aging adults naturally develop fears of losing their abilities to care for themselves.

Research fairly consistently yields a moderate degree of stability in attachment styles or orientations from infancy to adulthood, and a moderate to high degree of stability through the adult years, but it also indicates that attachment styles remain responsive to changing life circumstances (Mikulincer & Shaver, 2007). Further complicating the analyses of data on this subject, some attachment theorists also regard attachment styles as manifesting differently across

different contexts (Mikulincer & Shaver, 2007; Baldwin, Keelan, Fehr, Enns, & Rangarajoo, 1996; Mikulincer & Shaver, 2003). The less chronically accessible attachment styles affect measurable changes on momentary self-conceptions, defenses, and behaviors, and are a source of temporary changes in attachment style outcomes. As Mikulincer and Shaver (2007) remarked in a book chapter that discussed attachment style stability, “[t]he developmental trajectory of childhood, adolescent, and adult attachment is not linear or in any other way simple.” Nevertheless, the utility of applying attachment theory principles to clinical medicine depends, in part, on the assumption that attachment styles remain largely stable over long periods of time.

III. The conceptualization and measurement of attachment style

“Although the validity of the theory itself may not depend on the quality of measurement, our ability as researchers to test the theory and to accumulate convincing evidence of its usefulness is closely tied to the quality of our measures.”

(Kim Bartholomew, 1994)

A. Early models of attachment style

Attachment theory originated from the work of John Bowlby, a British psychologist, and developed further from Bowlby’s collaboration with the developmental psychologist Mary Ainsworth (Thompson & Raikes, 2003; Hooper, et al., 2012). Bowlby theorized that, early in life, children develop an understanding of whether their attachment figures (e.g., their parents) accept or reject them, and that such knowledge contributes to their perceptions of others as either trustworthy or untrustworthy, and of themselves as either worthy or unworthy of love and care (Bowlby, 1973; Dykas & Cassidy, 2011). These internal working models function to influence the ways in which individuals subsequently obtain, organize, and operate on attachment-relevant

social information, and they provide both conscious and unconscious rules for the direction and organization of attention and memory (Dykas & Cassidy, 2011). Mary Ainsworth developed the first instrument for measuring attachment style (commonly referred to as ‘the Strange Situation’), which consists of a protocol for observing infants’ responses to a series of episodes of contact, separation, and reunion with their primary caregivers, and for coding these observations to assess patterns of attachment behaviors (Bartholomew, 1990; Mikulincer & Shaver, 2007; Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010; Maunder & Hunter, 2001).

Based on the results of several experiments, Mary Ainsworth identified three distinct patterns of attachment behaviors that she labeled as “secure”, “anxious-ambivalent/resistant insecure”, and “anxious/avoidant insecure” attachment styles (Ravitz, et al., 2010; Maunder & Hunter, 2001). A fourth category, “disorganized/disoriented” described infants who displayed behaviors that belonged to more than one attachment style pattern (Ravitz, et al., 2010; Maunder & Hunter, 2001). Ainsworth depicted secure infants as showing signs of distress as a result of their separations from their primary caregivers, directly signaling their distress to caregivers upon their reunions, and calming down immediately after contact with their caregivers (Ravitz, et al., 2010; Maunder & Hunter, 2001). The anxious/ambivalent infant, by contrast, showed distress about their caregivers’ absences, but alternately signaled for, and resisted, contact with their caregivers at the time of their reunions (Ravitz, et al., 2010; Mikulincer & Shaver, 2007; Bartholomew, 1990; Maunder & Hunter, 2001). Finally, the avoidant infant showed distress during the separation period only sometimes, and mostly ignored their caregiver upon their reunion with them (Ravitz, et al., 2010; Mikulincer & Shaver, 2007; Maunder & Hunter, 2001; Bartholomew, 1990; Diamond, Hicks, & Otter-Henderson, 2006; Carpenter & Kirkpatrick, 1996; Feeney & Kirkpatrick, 1996; Kim, 2006). Egeland and Farber later replicated most of

Ainsworth's findings, and further reported that mother-reported and nurse-reported ratings of mothers' interest in their 3-month old infants predicted the quality of infants' attachment styles 9 months later (Egeland & Farber, 1984; Bartholomew, 1990). Many other approaches to classifying and measuring attachment styles now permeate the literature of attachment theory research, but Ainsworth's early recognition and coding of attachment patterns in infants heavily influenced the developments of most of them (Ravitz, et al., 2010).

Early applications of attachment theory focused exclusively on the parent-infant relationship, ignoring other prototypic attachment relationships of interest, and occurred predominantly in studies that researchers conducted among populations of infants and young children (Bartholomew, 1990). Main, et al. developed the Adult Attachment Interview (AAI) to predict the attachment patterns of infants and their caregivers, but researchers subsequently applied it to numerous studies, including some conducted in adult populations (Ravitz, et al., 2010). The first instrument developed explicitly for the purpose of measuring attachment styles in adults came out of Hazen and Shaver's extension of Ainsworth's 3-category classification of infants to adult populations, in the context of relationships with their romantic partners (Hazen & Shaver, 1987; Griffin & Bartholomew, 1994; Mikulincer & Shaver, 2007). The brief self-report measure assigned adult study participants to categories that the authors referred to as "anxious", "avoidant", and "secure" attachment styles. It contrasted sharply with pre-existing observation or interview-based measures of attachment style, and led to a division in attachment theory research, between studies that derived from interview-based methods (e.g., the AAI), and those that derived from self-report measures (Mikulincer & Shaver, 2007; Maunder & Hunter, 2008). The two lines of research relate to different constructs (Mikulincer & Shaver, 2007). Where self-report measures ask respondents about their feelings and behaviors in the context of their

romantic or other close relationships, interview-based measures generate inferences about defenses associated with individuals' states of mind regarding childhood relationships with their parents (Fraley & Shaver, 2014).

In proposing that a self-report instrument could be used to assess adult attachment style, Hazen and Shaver argued that adults will accurately classify themselves according to the ways that they think, feel, and behave in close relationships (Hazen & Shaver, 1987; Ravitz, et al., 2010). Additionally, they predicted that the three attachment patterns observed in infants would emerge in adolescents and adults as three distinctive interpersonal styles (Kurdek, 2002; Hazen & Shaver, 1987; Ravitz, et al., 2010). As a means of testing this hypothesis, Hazen & Shaver presented adult research participants with three descriptions of behavioral patterns in the context of romantic relationships, which they believed to exemplify the attachment behaviors of the three attachment styles, and they asked each participant to identify the pattern that best characterized their own ways of relating to their romantic partners (Hazen & Shaver, 1987). The results of their study supported their main hypothesis that attachment theory provides an integrative framework for studying close relationships, and can be applied to populations of adults (Bartholomew, 1994; Ravitz, et al., 2010; Griffin & Bartholomew, 1994; Hazen & Shaver, 1987; Mikulincer & Shaver, 2007).

In the years since these early attempts to define and measure attachment style, a passel of more sophisticated questionnaire-based scales and self-classification methods have come into existence. Notably, Bartholomew and Horowitz developed the self-report questionnaire that this thesis uses, which delineated four attachment styles lying along the boundaries of a two-dimensional axis (The Relationship Questionnaire (RQ)) (Bartholomew & Horowitz, 1991). They developed the measure based on elements from a variety of attachment style constructs,

including Hazen and Shaver's secure, anxious, and avoidant styles; Collins and Read's dependency, anxiety, and closeness styles; Simpson, Rholes, and Nelligan's avoidance and anxiety styles; and their own secure, fearful, preoccupied, and dismissing styles (Kurdek, 2002; Bartholomew, 1990; Bartholomew & Horowitz, 1991). As the first to identify four attachment styles and two attachment style dimensions, Bartholomew's classification brought into focus a subgroup of individuals with avoidant attachment styles who stood apart as a function of their strong needs for independence and tendencies towards compulsive self-reliance (Bartholomew, 1990; Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2007). A substantial degree of evidence now exists to qualify this distinction, albeit not proposed in the seminal works of Hazen and Shaver or Ainsworth as part of their conceptualizations of adult and infant attachment styles, respectively (Mikulincer & Shaver, 2007). Other researchers use measures that focus on relationship-specific attachment orientations, hierarchical domains of relationships, family-reported ratings of attachment styles, or inferences from non-autobiographical narratives and coding techniques similar to those employed by the AAI (Mikulincer & Shaver, 2007; Rosenberg & Shields, 2009). In short, attachment style measures historically, and currently, reflect a multiplicity of different foci and methods (Mikulincer & Shaver, 2007).

Despite the considerable and variegated cohort of measures currently available to adult attachment theory researchers, their collective psychometric properties remain, largely, obscure (Kurdek, 2002). Moreover, the extensive use of differing nomenclatures to represent similar or overlapping constructs across a large number of studies greatly complicates the task of interpreting study findings accurately (Mikulincer & Shaver, 2007; Kurdek, 2002). Consequently, a substantial degree of uncertainty now persists, with regards to which measures of attachment style may be considered most useful or valid in any given study. Currently, a lack

of consensus persists regarding the best practices associated with measuring attachment styles (Hooper, et al., 2012; Bifulco, et al., 2003; Daniel, 2006; Kurdek, 2002; Jacobitz, Curran, & Moller, 2002; Maunder, et al., 2006). All attachment style measures differentiate between patterns of secure and insecure attachment, such that a bright line divides the two categories regardless of their particular subtypes, and all probe aspects of emotion regulation, interpersonal awareness, and behavioral strategies in close relationships (Ravitz, et al., 2010). However, different methods of assessing attachment style emphasize disparate phenomena differentially. Multiple debates persist on controversies that pertain to attachment style measurement, including whether interview-based or self-report measures better capture attachment styles (Maunder & Hunter, 2009; Maunder & Hunter, 2012b; Ravitz, et al., 2010; Mikulincer & Shaver, 2007), and on the relative appropriateness of using categorical versus continuous/dimensional or prototype measures in research (Mikulincer & Shaver, 2007; Griffin & Bartholomew, 1994; Fraley, Hudson, Heffernan, & Segal, 2015).

B. Interview-based versus self-report methods of measuring attachment style

Studies comparing interview-based and self-report measures of attachment style show only weak correlations between their constructs, so that the two approaches appear to not converge on discrepant phenomena (Maunder & Hunter, 2012; Mikulincer & Shaver, 2007; Ravitz, et al., 2010). Attachment theorists assert that the use of these approaches generated two fairly distinct lines of research (Mikulincer & Shaver, 2007), which further complicates the interpretation of study findings in an already convoluted area. Though subject to significant limitations, self-report measures of attachment style appear better suited to clinical applications of attachment

theory in medicine, and some researchers consider them appropriate for use in certain situations (e.g., Mikulincer & Shaver, 2007; Maunder, et al., 2006; Maunder & Hunter, 2012).

Interview-based measures of attachment style tend to describe respondents' "attachment states of mind" through the expert coding of narratives resulting from applications of techniques researchers designed to activate individuals' attachment systems (e.g., priming words). For example, the AAI mobilizes the attachment system by enquiring about individuals' salient memories of separation, loss, and conflict. Such a strategy purportedly taps into adults' *unconscious* tactics for regulating their emotions (Mikulincer & Shaver, 2007; Jacobitz, et al., 2002). Contrastingly, self-report measures elicit conscious and deliberate responses to researchers' explicit questions; they most likely restrict contingent observations to those indexed by conscious mental processes, and preclude the detection of any distorted responses resulting from participants' conscious or unconscious defense mechanisms (Mikulincer & Shaver, 2007; Ravitz, et al., 2010). Furthermore, interview-based methods' proponents argue that their approach yields rich data on participants' attachment-related information processing strategies that, in turn, reflect on their working models via the identification of characteristic tenors in how each participant describes their parent-child relationships or constructs and relates their personal narratives (Mikulincer & Shaver, 2007; Bernier & Dozier, 2002). A major contribution of interview-based methods for evaluating attachment styles relates to its recognition of narrative coherence as a fundamental marker of attachment style security (Maunder & Hunter, 2012). The approach remains the "gold standard" for measuring attachment style in studies where attachment styles are the primary area of investigation (Ravitz, et al., 2010), but it lacks an emphasis on clinically interesting behavioral patterns thought to explain differences in the health outcomes of chronically ill patients. Also, interview-based measures require expert training to

administer, making them poorly adapted for routine use by clinicians in a medical setting (Maunder & Hunter, 2012).

Self-report measures of attachment style proved easy and inexpensive to administer in some medical and health-related studies (Maunder & Hunter, 2012), and extensive research demonstrated the utility of measuring attachment style patterns of adults in a variety of situations with self-report measures (Ravitz, et al., 2010; Maunder & Hunter, 2009; Maunder & Hunter, 2012; Ciechanowski, et al., 2006). However, several researchers questioned the validities and reliabilities of single-item self-report measures (e.g., Zhang & Labouvie-Vief, 2004; Bifulco, Moran, Ball, & Bernazzani, 2002), and the limited temporal stabilities of self-report measures that make use of categorical scales of measurement pose a problem for studies which evaluate hypotheses whose utilities depend heavily on assumptions of significant stability over a long period of time (e.g., across the life course) (Van Assche, et al., 2013). Despite such limitations, some researchers attest to the usefulness and appropriateness of self-report attachment style measures, depending on the circumstances of a given study (Mikulincer & Shaver, 2007; Maunder & Hunter, 2012).

C. Typological, dimensional, and prototype-based approaches to measuring attachment style; Categorical, continuous, and ordinal scales of measurement

In *The Metaphysics of Measurement: The Case of Adult Attachment*, Griffin and Bartholomew remind readers that “*Any test of any theory is limited by the quality of the measurement procedures used in that test . . . [and that, f]urthermore, the choice of measurement procedure carries with it implicit theoretical assumptions about the nature of the phenomenon under study*” (Griffin & Bartholomew, 1994). In other words, the authors contend,

“theory and measurement are inextricably linked” (Bartholomew, 1994). The authors pose certain questions that lie at the heart of any consideration regarding which particular measure of attachment style best accomplishes the aims of a given study: “[I]s the underlying construct best characterized as a set of types or categories, or as continuous dimensions? If a categorical approach is chosen, are people to be placed into discrete groups or fuzzy sets?” (Griffin & Bartholomew, 1994). Accordingly, this subpart of the current thesis deals with the issue of how its study conceptualizes and measures attachment style in its associated statistical analyses.

The current thesis ascertains attachment style using a measure adapted from Bartholomew and Horowitz’s Relationship Questionnaire (RQ)—an instrument that incorporates three different approaches to conceptualizing and measuring individual differences in adult attachment: dimensional, typological, and prototypical approaches (Griffin & Bartholomew, 1994). Utilizing the RQ in a study involves choosing one of these three approaches, and the current thesis employs a variant of the prototype-based approach (described in subpart 2.III.C.iii.). The following paragraphs provide an overview of advantages and disadvantages contingent in each approach, before turning to a description of the approach employed by this thesis.

i. Typological models of adult attachment style and categorical scales of measurement

Both Ainsworth’s and Hazen and Shaver’s original approaches to operationalizing attachment style serve as prominent examples of measures that conceptualize attachment style typologically and measure it categorically. They led to the early dominance of direct, and indirect, typological methods that group people into mutually exclusive categories, thought to represent discrete attachment style sub-types (Ravitz, et al., 2010; Griffin &

Bartholomew, 1994). Many researchers have discussed the limitations associated with using instruments that measure attachment style on a categorical scale, including inability to facilitate conclusions about stability, or to discuss study participants in terms of their attachment style orientations (e.g., their particular blends of primary, secondary, and even tertiary attachment styles) (Bartholomew, 1994; Griffin & Bartholomew, 1994; Simpson, 1990; Scharfe & Bartholomew, 1994; Kurdek, 2002; Ravitz, et al., 2010). Categorical methods attract frequent criticisms, theoretically, for assuming that differences among people within specific attachment style categories are altogether “unimportant or do not exist” (Mikulincer & Shaver, 2007; Ravitz, et al., 2010), and analytically, for their limiting effects on statistical power, as compared to ordinal, continuous, or dimensional measures of attachment style (Fraley & Shaver, 2000; Ravitz, et al., 2010; Simpson, 1990). Additionally, single-item categorical measures likely exacerbate any instability associated with attachment styles, given that their ‘either-or’ formats prove highly sensitive to even small changes in participant response tendencies (Griffin & Bartholomew, 1994). They also incite the loss of any information about attachment style severity. On the other hand, two profound advantages of using categorical approaches to measuring any phenomenon include: 1) the potential for throwing a sharp light on inter-individual differences related to a particular construct (which allows for the “capture [of] the ‘true’ nature of the phenomenon of interest, and 2) the capacity to produce study results that facilitate clear and actionable interpretations (Griffin & Bartholomew, 1994).

ii. Dimensional models of adult attachment style and continuous or ordinal scales of measurement

Psychometric instruments commonly characterize individuals as points along one or more continuous dimensions underlying a construct; where any given individual stands on these dimensions explains her or his thoughts, feelings, and behaviors (Griffin & Bartholomew, 1994). Such an approach implies that, first, no sudden shift occurs that divides people into different categories and, second, each dimension affects outcomes in a manner independent of all other dimensions (Griffin & Bartholomew, 1994). It, therefore, misses any important characteristics that result from interactions that occur between the dimensions in reality (Griffin & Bartholomew, 1994). An advantage of the dimensional approach lies in its high statistical efficiency, as a design that prevents the loss of information generally associated with dividing a study's research participants into groups (Griffin & Bartholomew, 1994). It also allows for the flexibility associated with correlational data analysis (Griffin & Bartholomew, 1994). However, many researchers report considerably more difficulty in understanding dimension-based approaches, as compared to typological or prototype approaches (Griffin & Bartholomew, 1994), which renders findings that result from studies of attachment style dimensions simultaneously more complicated to interpret and less translatable into clinical practice guidelines (Maunder, et al., 2006; Maunder & Hunter, 2009).

In the late 1990s, attachment theory researchers began to transition away from categorical measures and towards a dimensional framework (Fraley, Hudson, Heffernan, & Segal, 2015). Early taxometric research that suggested people vary continuously (and not categorically) in attachment style security (Fraley & Waller, 1998) drove this shift (Fraley, et al., 2015). However, categorical models and methods continue to guide much of the work in the field,

which indicates that the debate about types versus dimensions remains unresolved (Ravitz, et al., 2010; Fraley, et al., 2015; Maunder, et al., 2006). Recent advancements in statistical methods for answering this question produced neoteric research that, once again, submits that dimensional instruments better conceptualize and measure individual differences in attachment style characteristics (Fraley, et al., 2015). Combined with the pragmatic limitations of using categorical models, these findings caused Fraley, et al. (2015) to denounce categorical measures of attachment as copiously indefensible. The authors contend that dimensional models capture a degree of richness and complexity simply unobtainable by categorical methods (Fraley, et al., 2015). Although statistical software packages generally treat dimensional measures as continuous, and researchers interpret the corresponding results as capturing participants' positions at one of any possible points on one or more continuous dimensions, they often relate to ordinal scales of measurement. This means that, much of the time, dimensional results more accurately depict the positions of participants who fall at one of several points, rather than any point, on one or more continuous dimensions.

iii. Prototype-based models of adult attachment style

A prototype approach to attachment allows for the assessment of how well an individual fits *each* categorical prototype description at a given time (Griffin & Bartholomew, 1994). In the context of the RQ, a prototype-based approach particularizes individuals in terms of the degrees to which each of the four attachment style descriptions apply to them (Griffin & Bartholomew, 1994; Bartholomew & Horowitz, 1991). A prototype is an ideal category member defined in terms of the most common features of members of that category, with no particular features being individually necessary or jointly sufficient to define group membership (Griffin &

Bartholomew, 1994; Rosch, 1978). Group members differ in the degrees to which they correspond to a prototype, and categories may be viewed as “fuzzy sets” that overlap with one another and contain individuals who vary in their degrees of typicality (Griffin & Bartholomew, 1994; Rosch, 1978). Applying this method, participants appear in clusters rather than groups, and measures employ ordinal scales within categories to summarize participants according to their orientations in relation to all attachment style categories/prototypes (Griffin & Bartholomew, 1994; Bartholomew, 2015). The ordinal scales measure the extents of each participant’s similarities to one or more prototypes.

In many ways, the prototype-based approach to measurement integrates and addresses the strengths and limitations of dimensional and categorical approaches (Griffin & Bartholomew, 1994). It acquiesces to distinct patterns of attachment behaviors (easing the interpretability of results), while recognizing the implausibility that any given adult perfectly conforms to a single prototype (Griffin & Bartholomew, 1994). It focuses on within-group, as well as between-group differences, and the corresponding measures retain much of the statistical advantage associated with dimensional/continuous measures. Direct prototype measures, such as the RQ, also demonstrate greater statistical power than indirect prototype measures, such as the Relationship Scales Questionnaire (RSQ), that present participants with lists of statements that describe individual attachment style thoughts, feelings, or behaviors (Griffin & Bartholomew, 1994). Bartholomew, one of the authors of the RQ, presently asserts that obtaining continuous ratings of each of the four attachment style measures (i.e. the prototype approach) constitutes the ideal use of the measure (Bartholomew, 2015).

D. “Dismissingness always matters”: The conceptualization and measurement of attachment style in the current thesis

The current thesis applies an ordinal (or “continuous”) prototype-based approach to conceptualizing and measuring attachment styles as detected by a measure adapted from the RQ, but rather than summarizing results in terms of participants’ orientations to four attachment style categories, it focuses on one category of particular interest to diabetes progression. A review of the evidence on attachment style’s contributions to diabetes health revealed that individuals with predominantly dismissing attachment styles consistently sustained some of the worst diabetes health outcomes (refer to subpart 2.IV.C. of this thesis). The current thesis examines whether HbA1c levels increase with relatively higher levels of a dismissing attachment style in type 2 diabetics. This novel approach bypasses several of the weaknesses accessory to the categorical method, capitalizes on existing research about attachment style and diabetes, and retains the advantage of simplifying the interpretation of the results, compared to the evidence based on methodologies using attachment style dimensions. It takes as its starting point the results of studies on diabetes and attachment style that demonstrate associations between the dismissing attachment style and worse diabetes health outcomes, compared to all other attachment styles. The literature review in this thesis challenges the validity of such findings, and contends that more research is needed to conclusively determine whether the dismissing attachment style lends itself to worse diabetes health outcomes than those associated with other attachment styles. Nonetheless, the hypotheses evaluated herein stand alone; if experts deemed the extant research on diabetes and attachment style invalid, it would perhaps diminish the apparent utility of evaluating them, but each hypothesis would remain intact and possessing of some intrinsic worth.

The approach taken by this thesis also acknowledges the importance of attachment style severity to determining contingent outcomes—a facet that categorical measures of attachment style status ignore, altogether. Some researchers in the area of attachment style and physical health propose models that dispense with clear distinctions between individual attachment style categories, arguing that the “the key clinical question is ‘How severe is this person’s insecurity?’” (Maunder & Hunter, 2012a). Such authors maintain that the degree of attachment style insecurity (as well as whether sufficiently severe attachment style insecurity manifests—suggestive of a threshold effect) dictates the most immediate clinical impact, rather than the qualities characteristic of the most closely aligned attachment style category (Maunder & Hunter, 2012a). Some evidence supports this perspective. In one study (i.e., Maunder, Lancee, Hunter, Greenberg, & Steinhart, 2005), researchers found no correlation between disease activity and depression among patients in the lowest tercile of attachment anxiety, but they found a strong correlation between these variables among patients in the highest tercile of attachment anxiety. The results of another study (Sloan, Maunder, Hunter, & Moldofsky, 2007) showed that participants with the highest level of alpha intrusion (a measure of vigilance or arousal during sleep/the outcome of interest) reported the highest levels of attachment anxiety and attachment avoidance. Moreover, Maunder and Hunter (2012a) assert that discrete boundaries between categories of attachment prove “uncommon in clinical practice”, and that medical patients most often exhibit attachment styles which combine elements of more than one attachment style category; Bartholomew, et al. concur in the context of the general population, noting that most individuals show complex profiles across attachment patterns, with few exhibiting prototypical patterns (Bartholomew, Kwong, & Hart, 2001).

Adult attachment styles often manifest quite differently between people who vary in the relative types and severities of subtypes that make up their attachment style orientations (Griffin & Bartholomew, 1994; Bartholomew, et al., 2001). For example, a moderately secure but secondarily dismissing individual cogently looks quite different than a moderately secure but secondarily preoccupied individual (Griffin & Bartholomew, 1994). Griffin & Bartholomew illustrated such an eventuality by citing to a study of men in treatment for domestic violence (Dutton, Saunders, Starzomski, & Bartholomew, 1992), wherein few study participants identified as primarily secure in their attachment style subtypes, but continuous ratings of attachment style security predicted a range of psychosocial outcomes, including the severities of their abuse, their borderline personality organizations, and their trauma-related symptoms (Griffin & Bartholomew, 1994). Attachment theory considers attachment styles as conceptually distinct dimensions, so that individuals may be characterized interpersonally by varying degrees of each (Ciechanowski, Sullivan, Jensen, Romano, & Summers, 2003). Stated differently, *dismissingness always matters*, regardless of which attachment style predominates in a given person, in the sense that it always plays some role in determining the nature of attachment style-dependent outcomes. Accordantly, this thesis postulates that dismissingness always matters for determining the quality of diabetes-related health outcomes.

To understand some implications of the perspective adopted by this thesis (outlined above), reflect on a scenario wherein one study participant attributes to themselves a rating of 3 on the RQ scale for the dismissing attachment style, along with ratings of 2 and 1 on the secure and fearful attachment style scales, respectively, and another study participant rates themselves as 7 on the secure attachment style subscale, alongside 6 on the dismissing attachment style subscale (Each attachment style subscale on the RQ includes values that range from 1 to 7). This evokes

a question about which of the two participants most likely manifests more characteristics (including diabetes health outcomes) associated with the dismissing attachment style. Existing research provides some information about the nature of associations between predominant attachment styles and diabetes health outcomes, and this thesis aims to produce information regarding whether (and to what degree) an association also exists between the absolute severity of a particularly important (in the context of diabetes) attachment style and diabetes health. Both types of information, in concert, potentially contribute to understanding how individuals respond to attachment-and-diabetes-related exposures; evaluating each facilitates a determination of whether one type sustains more predictive power than the other, in the context of diabetes health.

Feeney and Ryan (1994) utilized a similar approach to measuring attachment style in their seminal study about attachment style implications for physical health. Over the course of their study, the two investigators asked each participant to complete Hazen and Shaver's three-category assessment of attachment styles, and then to rate the "applicability" of all three prototypes to their particular cases on an ordinal scale of 1 to 7 (Feeney & Ryan, 1994). The investigators presented their findings as based on a combination of results from their applications of categorical and prototypical attachment style measures (Feeney & Ryan, 1994). In another study, Simpson opted to employ a cognated strategy (i.e., the Secure Attachment Style Index) that assessed individual-level and dyad-level associations between study participants' statuses on the same three attachment styles and their levels of trust, commitment, and satisfaction within their romantic relationships (Simpson, 1990). Simpson decomposed Hazen and Shaver's prototype vignettes into 13 individual sentences, and asked participants to rate, on a Likert-type scale of 1 to 7, the extent to which each believed that the sentences described them, before combining the results into three continuous indices that corresponded to Hazen & Shaver's

attachment style categories (Simpson, 1990; Hazen & Shaver, 1987). Both approaches resemble the one taken by this thesis, in that each accounts for attachment styles' severities, but unlike the current thesis' study both approaches additionally incorporated attachment style categories. At variance with some existing prototype methodologies (e.g., Schmidt, et al., 2002; Pilkonis, 1988), this thesis' novel approach focuses on evaluating the aggregated outcomes of all included individuals with respect to one attachment style prototype (the dismissing prototype), as opposed to rating and/or ranking individual prototype scores within each participant.

E. The Relationship Questionnaire (RQ), and an introduction to important attributes of the associated attachment styles

While some attachment theorists argue that their field long ago moved past the use of typological/categorical measures of attachment style (Bartholomew, 2015), there remains no consensus as to whether attachment phenomena are inherently categorical or continuous (Ravitz, et al., 2010; Fraley, et al., 2015; Maunder, et al., 2006). In the fields of social and developmental psychology, attachment theorists rely on the RQ less frequently than in the past, and they generally embrace newer measures of attachment style that take on a dimensional perspective. Recent taxometric analyses employing new and improved analytical methods indicate that individual differences in attachment styles are continuously (not categorically) distributed (e.g., Fraley, et al., 2015). Yet, at the same time, the application of attachment theory to research now extends well beyond the arena of social psychology, and into disciplines that differ markedly in their respective traditions for integrating theory and/or empirical findings from research into their practices. In the field of medicine, researchers tend to favor categorical measures, as they impose prescriptive boundaries on studies' results to precipitate their formulations in terms most readily translatable into actionable clinical guidelines (Ravitz, et al., 2010; Maunder, et al.,

2006). Attachment theory interventions in clinical medicine rest on the idea that, when presented in categories, related study findings enable clinicians to infer the presence of complex patterns of health-related behaviors as pertaining to their patients, based on knowledge of relatively few patient characteristics (Thompson & Ciechanowski, 2003). For the sake of simplicity, this thesis employs the categorical or typological shorthand used by many attachment theorists, for describing individual attachment style differences, throughout its concurrent literature review. At the same time, the author urges readers to not think of attachment styles in the manner of discrete types, but rather as fuzzy regions that occupy a two-dimensional space (defined by the two attachment style dimensions) (Mikulincer & Shaver, 2007; Griffin & Bartholomew, 1994; Bartholomew, 2015).

Attachment theory researchers in health and medicine most frequently present their results in terms of attachment style categories (Maunder, et al., 2006), and the most widely applied categorical conceptualization remains that proposed by Bartholomew and Horowitz (1991) in connection with the RQ (Meredith, Ownsworth, & Strong, 2008; Ravitz, et al., 2010). Some studies also present their findings in terms of RQ dimensions (Maunder, Lancee, Hunter, Greenberg, & Steinhart, 2005; Sullivan, et al., 2009; Ahrens, Ciechanowski, & Katon, 2012). The current subpart of this thesis provides a brief introduction to the categories and dimensions of attachment style as delineated by the RQ, and the categories consistent with Shaver & Hazen's conceptualization of attachment style (another broadly cited schema in health research). This serves to prime the reader for a later discussion on attachment theory research in the fields of health and medicine.

Bartholomew and Horowitz identified two dimensions of attachment styles, based on two key features of working models advanced by Bowlby in his rendering of attachment theory: 1)

the model of others, which centers on whether or not others are viewed as warm and responsive, and 2) the model of self, which relates to whether the self is judged to be worthy of love (Bartholomew, Cobb, & Poole, 1997; Bartholomew & Horowitz, 1991; Bowlby, 1973). The self model dimension corresponds to attachment anxiety (feelings of anxiety about one's worthiness of others' love; a strong desire for closeness and protection; intense worries about partner availability), and the other model corresponds to attachment avoidance (the degree of avoidance of proximity and intimacy in close relationships; discomfort with depending on relationship partners; preference for emotional distance and self-reliance) (Bartholomew, et al., 1997; Mikulincer & Shaver, 2007). The intersection of these two dimensions delimits the boundaries that separate Bartholomew, et al.'s prototypic attachment style patterns from one another (refer to Figure 2 for a diagram of this model) (Bartholomew & Horowitz, 1991; Bartholomew, et al., 1997).

		Model of Self	
		Positive	Negative
Model of Other	Positive	CELL I SECURE Comfortable with intimacy and autonomy	CELL II PREOCCUPIED Preoccupied with relationships
	Negative	CELL IV DISMISSING Dismissing of intimacy counter-dependent	CELL III FEARFUL Fearful of intimacy Socially avoidant

Figure 2: Diagram of attachment style categories and dimensions, based on Bartholomew and Horowitz’s conceptualization of attachment style in conjunction with their delineation of the Relationship Questionnaire (reproduced from Horowitz, Rosenberg, & Bartholomew, 1993)

Individuals low in both attachment anxiety and attachment avoidance are said to be *secure* (Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2007). Members of this category purportedly enjoyed warm and responsive parenting, which resulted in their developments of positive models of the self and positive models of others (Bartholomew, 1990; Mikulincer & Shaver, 2007; Hooper, et al., 2012). By contrast, *preoccupied* (a.k.a. *anxious* in Hazen and Shaver’s model) individuals develop negative models of the self, in response to inconsistent and/or insensitive parenting exposures (Bartholomew, 1990; Mikulincer & Shaver, 2007). They

perceive others as capable of loving and caring for them, but themselves as generally unworthy of love or attention. Consistently unresponsive and uncaring parenting purportedly gives rise to the third type in Hazen and Shaver's model, *avoidant*, or the third and fourth subtypes of Bartholomew and Horowitz's typology—*fearful* and *dismissing* attachment styles (Mikulincer & Shaver, 2007; Bartholomew, 1990; Bartholomew, 1997). Both fearful and dismissing individuals develop negative models of other people, seeing them as largely unavailable to help in times of need. However, the dismissing types maintain positive views of themselves, where fearful types develop negative views of themselves (Bartholomew, 1990; Bartholomew, 1997). Dismissing individuals deny their attachment needs and distance themselves from potentially rejecting attachment figures as a means of maintaining their positive views of the self. Fearful types similarly distance themselves from their attachment figures, driven by a pervasive sense of interpersonal distrust and fears of rejection, but unlike the dismissing types they desire social contact and intimacy (Bartholomew, 1997). Consequently, fearful individuals sustain subjective distress and disturbed, “approach-avoidance”, social relations, characterized by early and/or recurrent withdrawal from relationships and hypersensitivity to social approval (Bartholomew, 1990; Mikulincer & Shaver, 2007; Maunder & Hunter, 2012a).

Extensive research on individual differences by attachment style category describes myriad correlates of each subtype, many of which have meaningful implications for clinical applications of attachment theory in health and medicine (Maunder & Hunter, 2012; Maunder & Hunter, 2009; Maunder, et al., 2006). Maunder and Hunter (2009) summarized numerous of these differences in a series of tables reproduced, for the reader's convenience, in Appendix A to this thesis (for the original tables, and for cross-references/supporting citations, refer to Maunder & Hunter, 2009).

Secure attachment styles encourage comfort with closeness and autonomy in the context of close interpersonal relationships (Bartholomew, et al., 1997). Studies show positive associations between attachment security and a willingness to seek out social support, along with perceptions of available social support (Bartholomew, et al., 1997; Blain, Thompson, & Whiffen, 1993; Ognibene & Collins, 1997; Wallace & Vaux, 1993; Mikulincer, Florian, & Weller, 1993; Maunder & Hunter, 2012a). Secure individuals possess expectations of partner availability and responsiveness, trust in partners, comfort with independence and interdependence, a chronic sense of attachment security, and the ability to cope with threats and stressors in constructive ways (Mikulincer & Shaver, 2007; Maunder & Hunter, 2012a). The ability to both act independently and comfortably rely on others imbues secure types with the capacity to respond to stressors, illnesses, and adverse events in a flexible and adaptive manner (Hooper, et al., 2012; Tan, Zimmerman, & Rodin, 2005). Research suggests that behaviors and outcomes associated with securely attached individuals include resilience and good psychological and physical health (Hooper, et al., 2012; Maunder & Hunter, 2009; Maunder & Hunter, 2012a).

Among insecure types, *preoccupied and dismissing individuals* respond to threats and stressors in opposite, “maladaptive” ways, while fearful individuals adopt some combination of the these subtypes’ strategies. High attachment anxiety (preoccupied and fearful types) relates to *hyperactivation* of the attachment system in response threat, while high attachment avoidance (dismissing and fearful types) relates to attachment system *deactivation* (Mikulincer & Shaver, 2007; Pietromonaco, Uchino, & Schetter, 2013; Meredith, Strong, & Feeney, 2007). Hyperactivating strategies for affect regulation include hypervigilance with respect to possible threats, rumination about previous and potential threats, exaggerated appraisals of threats (catastrophizing), and increased urgency for gaining attention, care, and support from available

relationship partners (e.g., increased support-seeking behaviors) (Mikulincer & Shaver, 2007; Pietromonaco, et al., 2013; Meredith, et al., 2007). Deactivating strategies, on the other hand, include diverting attention away from threats and inhibiting or suppressing threat-related thoughts, as well as engaging in efforts to increase one's distance from their potential attachment figures (Mikulincer & Shaver, 2007; Pietromonaco, et al., 2013).

Preoccupied individuals demonstrate a general need for expressing constant signals of distress or illness, as a means of ensuring that other people meet their needs in consistent and predictable fashions (Hooper, et al., 2012; Tan, et al., 2005). Researchers describe preoccupied individuals as “clingy,” dependent on their caregivers, anxious, emotional, approval-seeking, and excessively care-seeking (Maunder & Hunter, 2001; Hooper, et al., 2012). In the context of medical care they tend to over-report their symptoms (Hooper, et al., 2012; Maunder, et al., 2006; Ciechanowski, et al., 2001).

Dismissing and fearful individuals, alternatively, perceive others as likely to reject them and/or to ignore any of their attempts at gaining support in times of need. They are less likely to trust others and seek support from them, or to self-disclose information over the course of their interpersonal interactions (Maunder, et al., 2006; Bartholomew & Horowitz, 1991). As patients, dismissing types downplay their symptoms and the severities of their illnesses, or abjure to report any symptoms at all, in order to reinforce their senses of self-sufficiency and avoid forming relationships with their health care providers (Thompson & Ciechanowski, 2003; Hooper, et al., 2012; Maunder & Hunter, 2001; Maunder & Hunter, et al., 2006; Maunder & Hunter, 2009). Members of this category strive for autonomy and to maintain their personal senses of self-worth, at the cost of intimacy in their close relationships (Maunder & Hunter, 2001; Hooper, et al., 2012; Meredith, et al., 2007). They often take pride in depending only on

themselves (Maunder & Hunter, 2001; Hooper, et al., 2012), and attachment theorists attribute to them the quality of “compulsive self-reliance” (Mikulincer & Shaver, 2007; Hooper, et al., 2012).

Finally, individuals with *fearful attachment styles* differ from the dismissing types in that they desire social contact, but they also perceive caregivers as potentially hostile or threatening, and remain inhibited by their fears of rejection (Hooper, et al., 2012; Tan, et al., 2005; Ciechanowski, et al., 2006b). Like preoccupied individuals, fearful types believe themselves unworthy of care. This leads them to perceive others as untrustworthy to provide them with adequate care in times of need. Researchers construe fearful individuals as demonstrating a push-pull dynamic, in which they occasionally engage with their attachment figures (e.g., physicians), but largely avoid them (Waldinger, Schulz, Barsky, & Ahren, 2006; Thompson & Ciechanowski, 2002; Maunder & Hunter, 2012b; Maunder & Hunter, 2012a); they often describe the members of this category as detached, disengaged, cautious, doubting, or self-conscious (Hooper, et al., 2012; Maunder & Hunter, 2001).

IV. Attachment theory in health and medicine

A. The promises and the perils of attachment theory for clinical medicine

Attachment theory, as developed by John Bowlby and others, posits that the parent-child attachment bond formed during infancy directly relates to mental and physical health, and health-related behaviors, along with overall functioning in adulthood (Hooper, Tomek, & Newman, 2012). Thus far, the paradigm evinces “remarkably broad and consistent” explanatory power for individual differences in many aspects of relationship functioning and, by some accounts,

presides as “an exemplar of relationship science because of its potential to generate a multitude of interesting hypotheses relevant to the connection between relationships and health behavior outcomes” (Pietromonaco, Schetter, & Uchino, 2013). Some researchers appraise attachment theory as one of the most forcible theories to integrate a wide variety of coping concepts, with coping considered as one of the core apprehensions of health psychology (Schmidt, Nachtigall, Wuentrich-Maretone, & Strauss, 2002). Moreover, the theory’s principles introduce novel ways to extend and integrate research from various robust concepts already established in health research (e.g., social support, care-seeking behaviors, self-efficacy, cognitive representations).

Such interests in attachment theory as a propitious framework for advancing health-related objectives transcends the province of mere research, as some of its proponents envision attachment theory applications to the clinical practice of medicine. In recent years, several researchers promoted the idea of screening medical patients for their attachment styles, routinely, using short self-report questionnaires (e.g., the RQ) (Ciechanowski, et al., 2006; Waldinger, et al., 2006; Hooper, et al., 2012; Bifulco, et al., 2002; Levy, et al., 2011; Ciechanowski, 2007). Collectively, they asserted that understanding patients’ interpersonal styles stands to enable clinicians to adapt their medical care in ways which incorporate patients’ individual strengths and weaknesses (Maunder & Hunter, 2009; Hunter & Maunder, 2001; Schmidt, et al., 2002; Hooper, et al., 2012; Ciechanowski, 2007). Adaptations to patients’ attachment style needs potentially include educating clinicians to respect the autonomy of less collaborative patients; enhancing patients’ personal control through motivational interviewing; engaging in relationship-focused, problem-solving therapy or coaching sessions that address obstacles experienced by preoccupied, fearful, and dismissing patients; providing a therapeutic style that complements rather than matches a patient’s activating, hyperactivating, or deactivating style;

accommodating alternative modes of contact and outreach; and referring patients with comorbid psychiatric conditions to interpersonal psychotherapy (Ciechanowski, Russo, Katon, Von Korff, Simon, Lin, Ludman, & Young, 2006; Maunder & Hunter, 2009; Tyrell, Dozier, Teague, & Falot, 1999). Screening for attachment styles purportedly differentiates between patients who endorse or repel trust and collaboration with their healthcare providers, along with several other clinically meaningful factors (e.g., satisfaction with care, fewer social supports, adverse childhood experiences, depression, perception of the provider as empathic) (Ciechanowski, et al., 2006; Maunder & Hunter, 2009).

As a normative theory of human development, and one which postulates that individual differences endure from early childhood to adulthood (Schmidt, et al., 2002), attachment theory presents an opportunity for clinicians to discuss sensitive or potentially stigmatizing health behaviors with patients through a lens that reduces personal blame and perceived (or actual) discrimination based on SES (Ciechanowski, Hirsch, & Katon, 2002; Ciechanowski, et al., 2006; Hunter & Maunder, 2001; Maunder & Hunter, 2008). Educating clinicians in attachment theory principles facilitates empathy and understanding of patients who adhere less regularly with their treatments, or who present as less collaborative with their healthcare providers—those commonly described by the literature as “difficult patients” (Ciechanowski, et al., 2006; Maunder, Panzer, Viljoen, Owen, Human, & Hunter, 2006). It holds the potential to cut across socioeconomic class boundaries, while conceivably allowing for sufficient flexibility in discussions of health policy that accounts for SES disparities in physical health, to mitigate the risk of stigmatizing members from especially vulnerable populations. Because it theoretically applies to individuals across the life course, attachment theory also offers a vehicle for unifying

elements of individuals' care longitudinally, including across transitions, within an exceedingly fragmented system (Ciechanowski, et al., 2006; Ali, Echouffo-Tcheugui, & Williamson, 2012).

The conventional names of widely adopted attachment styles arguably carry with them pejorative connotations, and certain attachment style subtypes already bow beneath the weight of stigmatizing stereotypes in the medical arena and beyond. For example, researchers regard preoccupied individuals as notoriously “clingy” and “emotionally over-dependent”, taxing the patience of providers who care for them and generating higher healthcare costs in the process (Ciechanowski, et al., 2002; Maunder & Hunter, 2012; Dozier, 1990; Mikulincer & Shaver, 2007; Hunter & Maunder, 2001). In their extreme forms, attachment styles also map closely to stigmatizing psychopathologies, including borderline personality disorder and schizoid personality disorder (Mikulincer & Shaver, 2007; Bartholomew, et al., 2001; Meyer & Pilkonis, 2005; Brennan & Shaver, 1998; Bartholomew, et al., 2001), and yet, it remains inaccurate to equate these disorders with their associated attachment style patterns (Bartholomew, et al., 2001; Mikulincer & Shaver, 2007). Attachment theory explains social and emotion-regulation difficulties among people without personality disorders, more generally (Mikulincer & Shaver, 2007; Bartholomew, et al., 2001; Meyer & Pilkonis, 2005). Given these conditions, it appears that screening patients on attachment style outcomes likely exposes them to non-trivial risks of stigmatization and/or discrimination (detailed further in the discussion section of this thesis).

As a way of addressing such risks, Ciechanowski, et al., and others proposed that clinicians adopt a new language for discussing attachment style constructs (Ciechanowski, 2007; Ciechanowski, Russo, Katon, Lin, Ludman, Heckbert, Von Korff, Williams, & Young, 2010; Maunder & Hunter, 2009). For example, Ciechanowski invoked the lesser known synonym of attachment style—“relationship style”—and proposed a more neutral vocabulary for referring to

the attachment styles, based on clinically relevant characteristics (Ciechanowski, 2007). The author's rubric re-labels secure, preoccupied, dismissing, and fearful patients as individuals with "collaborative", "support-seeking", "self-reliant", and "cautious" relationship styles, respectively (Ciechanowski, 2007). Elsewhere, Ciechanowski, et al. proposed and utilized novel attachment style categories, according to their associated dispositions to trust (i.e., secure and preoccupied versus fearful and dismissing), and identified them as relationship styles with the names "independent" or "interactive" to describe them (Ciechanowski, et al., 2006; Ciechanowski, et al., 2010). Hunter and Maunder attested that the attachment theory understanding of a patient is easily communicated to both medical and non-medical staff, and that utilizing it allows all parties to discuss the patient-provider relationship openly, using non-pejorative concepts and terminology (Hunter & Maunder, 2001). Moreover, the authors argue that the attachment point of view suggests straight-forward interventions, easily planned and put into practice (e.g., sitting down when speaking with an avoidant patient, to avoid towering over them) (Hunter & Maunder, 2001).

Typological measures of attachment style pose the greatest risk with regard to issues of stigma and discrimination. Yet, the categorical version of the RQ stands as the most widely used measure of adult attachment style amid research conducted in psychosomatic medicine (Ravitz, et al., 2010; Maunder & Hunter, 2011). This likely occurred as a result of the interpretive efficiency that such approaches afford to providers, who regularly rely on cut points for disease indicators to gauge the statuses of their patients' health (Maunder & Hunter, 2009). The threats implicit in a method that reduces individuals to members of categories representing conceptual clusters of characteristics undoubtedly merit serious consideration (Tan, Zimmerman, & Rodin, 2005). However, the practice of medicine counteractively demands that clinicians cultivate

especially high aptitudes for assigning their patients to diagnostic categories *while recognizing any important differences* between the disease-related characteristics of their patients, and those that define a “textbook case.” Maunder & Hunter (2009) impart the nature of this dynamic:

“Adult attachment has been described using continuous dimensions and categorical types. Although a dimensional approach has theoretical and analytic advantages, healthcare providers often think in terms of ‘textbook cases’. Classifying phenomena according to their similarities to prototypes is such a powerful and familiar strategy that when physicians are faced with a continuous quantity (e.g., blood pressure) they often define a cutoff score that reduces the dimensions to categories (hypertensive versus normotensive).

Ciechanowski (2007) recommended that clinicians administer a brief self-report measure of attachment style—specifically the RQ—as a routine screening tool, but also that they follow up with a more detailed qualitative assessment of specific attachment style characteristics, drawn from a longer and more in-depth attachment style measure (e.g., the Relationship Styles Questionnaire (RSQ)), and questions designed to elicit patients’ perspectives on whether (and how) each characteristic that their designated attachment style indicates, in fact, affects their abilities for managing their diabetes/health symptoms. This strategy lends itself to the identification of intermediate cases, wherein patients present with attachment styles that fail to adequately conform to any single prototype description. Yet, regardless of which types of information a healthcare provider ultimately decides to include in their calculus, the conceptual coherence of any given patient’s clinical profile rests on their capacity to synthesize information from different categories that vary in prominence and importance between individuals. In other words, the challenges presented by accurately interpreting intermediate outcomes on an attachment style measure, or perceiving individual patients as distinctly different from the prototypical representations of their stereotyped categories, emblemize dilemmas that providers currently confront as a matter of course in their clinical practices.

B. A general overview of some evidence from studies on attachment theory in health and medicine

A significant body of research now recognizes attachment theory as an important framework for conceptualizing several determinants of health or disease. At the crudest level, various studies link attachment style insecurity with higher prevalences of certain diseases among both children and adults (Agostini, Ravegnani, Tambasco, & Ercolani, 2010; Feeney, 2000; Hazen & Shaver, 1987; Hazen & Shaver, 1990; Kotler, Buzwell, Romeo, & Bowland, 1994; McWilliams & Bailey, 2010; Puig, Englund, Simpson, & Collins, 2013; Cassidy, Jones, & Shaver, 2013), and some researchers suggest that the attachment model explains how interactions between infants and their caregivers result in lifelong vulnerabilities to illness (Maunder & Hunter, 2001). In a brief model, Miller, et al. proposed that early adverse experiences result in immune system cells with a “proinflammatory phenotype” and neuroendocrine dysregulation, leading to chronic inflammation—in turn, involved in a wide variety of aging-related diseases, such as cardiovascular disease and certain types of cancer (Miller, Chen, & Parker, 2011; Cassidy, et al., 2013). Supporting evidence links attachment in adulthood to biomarkers of immunity: attachment-related avoidance corresponds to heightened levels of the proinflammatory cytokines interleukin-6 (IL-6) in response to an interpersonal stressor, and to lower levels of natural killer cell cytotoxicity; attachment-related anxiety corresponds to elevated cortisol production and lower numbers of T-cells (Cassidy, et al., 2013). Other researchers reported associations between attachment style insecurity and higher disease rates.

Consistent with the above premise, Lewis, Feiring, McGuffog, & Jaskir, (1984) found that boys classified as insecure at 12 months levied more somatic complaints six years later than secure children of the same age, and Hazen and Shaver (1987, 1990) found that insecure adults

reported higher levels of depression, anxiety, psychosomatic illnesses, and physical illnesses (e.g., colds and influenza) than adults with secure attachment styles. One longitudinal study found that individuals classified as insecurely attached to their mothers at 18 months of age were more likely to report physical illnesses 30 years later (Puig, Englund, Collins, & Simpson, 2013). Two other longitudinal studies showed associations between early insecure attachment and higher rates of obesity at age 4.5 (Anderson & Whitaker, 2011) and 15 (Anderson, Gooze, Lemeshow, & Whitaker, 2012), while Nohesara, et al., found that obese patients with secure attachment styles reported significantly fewer medical comorbidities than insecure, obese patients (Nohesara, Sadeghi, Asl, Ghanbari-Jolfayi, & Sadeghi, 2015). In other studies, cystic fibrosis (Simmons, Goldberg, Washington, Fischer-Fay, & Maclusky, 1995), recurrent otitis media (McCallum & McKim, 1999), epilepsy (Marvin & Pianta, 1996), widespread chronic pain (Davies, Macfarlane, McBeth, Morriss, & Dickens, 2009), headaches (Savi, Buccheri, Tambornini, Martino, Albasi, & Pinessi, 2005), and Crohn's disease (Agostini, Rizzello, Ravegnani, Gionchetti, Tambasco, Straforini, Ercolani, & Campieri, 2010) corresponded to higher prevalences of attachment style insecurity than those that occurred in healthy control subjects. Fagundes, et al., reported an association between high attachment anxiety (e.g., preoccupied and fearful types) and elevated levels of antibodies to Epstein-Barr virus, which they posited reflects an association between attachment anxiety and dysregulations of cellular immunity, more broadly (Fagundes, et al., 2014). Picardi, et al., linked diffuse plaque psoriasis with higher levels of attachment-related avoidance, in comparisons with non-psoriasis controls (Picardi, et al., 2005), and Mrazek, et al. determined that 42 percent of the asthmatic children in their study possessed insecure attachment styles, as compared to only 14 percent their healthy controls (Mrazek, Casey, & Anderson, 1987). In a recent longitudinal study, researchers found

that participants identified as avoidantly and anxiously attached during their infancies appeared approximately 3 and 7.5 times more likely, respectively, than the securely attached participants to report having an inflammation-related illnesses at the age of 32 (Puig, et al., 2013). The same study also found that individuals classified as secure at two different time points reported suffering from the fewest physical illnesses on a self-report health questionnaire (adapted from the Adolescent Health Survey by Blum, Resnick, & Bergeisen, 1989), in comparison to participants with inconsistently secure or consistently insecure outcomes on the measure of attachment style outcomes (Puig, et al., 2013). The authors of this study concluded, on the basis of their findings, that insecure attachment styles in infancy represent an important predictor of poor physical health outcomes in adulthood (Puig, et al., 2013). Several studies' investigators found that more severe levels of attachment avoidance predicted higher rates of breast cancer (Tacón, Caldera, & Bell, 2001), somatoform diseases (Waller, Scheidt, & Hartman, 2004), gastroesophageal reflux disease (Ercolani, Farinelli, Trombini, & Bortolotti, 2004), and vitiligo (a skin pigmentation disorder) (Picardi, et al., 2003; Picardi, et al., 2005; Mikulincer & Shaver, 2007). Finally, a study analyzing cross-sectional data from the National Comorbidity Survey Replication (N=5645) included findings of no relationships between attachment style security and 15 different diseases, but significant relationships between avoidant styles of attachment and pain-related conditions (e.g., frequent or severe headaches), and between anxious styles of attachment and cardiovascular/other health conditions (e.g., stroke, heart attack, high blood pressure, ulcers) (McWilliams & Bailey, 2010). Altogether, the evidence presented in these studies support the theory that attachment style insecurity serves as a risk factor for the development of various diseases.

The earliest studies that explored relationships between attachment style and physical health grounded their hypotheses in pre-existing research that intimated connections between various attachment style correlates and health status indicators. For example, Feeney and Ryan cited to evidence that linked symptom reporting and illness onset with insecurity in social relationships, disruptions in one's social environment, and purportedly inadequate levels of social support (Feeney & Ryan, 1994; Henderson, Byrne, & Duncan-Jones, 1981; Hofer, 1984). Additional supports for their hypotheses included the findings that attachment style appeared to mediate the effects of stressors on immune function in one study (Kennedy, Kiecolt-Glaser, & Glaser, 1988), and that negative affect (associated with the ambivalent/preoccupied attachment style) related to a coping style which predicted health-related information-seeking behaviors and distress outcomes in response to medical procedures (Feeney & Ryan, 1994). Complementary research showed that an avoidant attachment style characteristic—the suppression of negative affect—consociated with a coping style that corresponded to a tendency to ignore signals of pain and fatigue, higher incidences of cancer, and poorer cancer prognosis (Feeney & Ryan, 1994; Kneier & Temoshok, 1984; Tacón, 2002). Moreover, negative emotionality (avoidant attachment) appeared as co-varying with subjective health complaints, while it remained largely unrelated to objective indicators of disease (Feeney & Ryan, 1994; Costa & McCrae, 1985; Costa & McCrae, 1987; Watson & Pennebaker, 1989).

An abundance of research evinces that positive relationships exist between social support and better health, and attachment theory provides one framework by which to constructively explore the interpersonal mechanisms which underlie these associations (Pietromonaco, et al., 2013; Berkman, Glass, Brissette & Seeman, 2000; Cohen, 2004; Tacón, 2002; Quick, Nelson, Matuszek, Whittington, & Quick, 1996; Uchino, Cacciopo, & Kiecolt-Glaser, 1996; Maunder &

Hunter, 2001; Uchino, 2006). Social support networks improve health by increasing access to instrumental, informational, and emotional support (Ciechanowski, Russo, Katon, Lin, Ludman, Heckbert, Von Korff, Williams, & Young, 2010; Cohen, Underwood, & Gottlieb, 2000). Studies show that people who lack social connections experience higher rates of mortality, especially from cardiovascular diseases, but also from other diseases that include cancer and diabetes (Pietromonaco, et al., 2013; Ciechanowski, et al., 2010; Berkman & Syme, 1979; Kaplan, Salonen, Cohen, Brand, Syme, & Puska, 1988; Zhang, Norris, Gregg, & Beckles, 2007; Uchino, 2006). Diabetics with higher levels of social support adhere to their treatments more fully, and demonstrate better glycemic control (Fukunishi, Horikawa, Yamazaki, Shirasaka, Kanno, & Akimoto, 1998). Many diabetes self-management behaviors optimally manifest with the support of others (e.g., smoking cessation, healthy diet, exercise) (Ciechanowski, 2010), although such relationships appear complex and inconsistent (e.g., Sadava, Busseri, Molnar, Perrier, & DeCourville, 2009; Puig, et al., 2013; Nam, et al., 2011). Research shows a consistent link between social support and lower ambulatory blood pressure—a predictor of cardiovascular problems above and beyond that predicted by conventional resting blood pressure readings (Gump, Polk, Kamarck, & Shiffman, 2001; Spitzer, Llabre, Ironson, Gellman, & Schneiderman, 1992; Linden, Chambers, Maurice, & Lenz, 1993; Steptoe, Lundwall, & Cropley, 2000; Perloff, Sokolow, & Cowan, 1983). Cohen, et al., (2005) indicated an association between greater levels of social support and better treatment adherence. Likewise, several studies indicate that a lack of social support corresponds to perceived barriers to self-care and future mortality and morbidity (Nam, et al., 2011; Bayliss, Steiner, Fernald, Crane, & Main, 2003; Cohen, 2004).

Attachment styles predict whether and how people seek support from close others, as well as the ability to provide care to others in need (Pietromonaco, et al., 2013; Collins & Feeney, 2010).

They also predict individuals' perceptions of support (Mikulincer & Shaver, 2007; Pietromonaco, et al., 2013; Rodin, Walsh, Zimmerman, Gagliese, Jones, Shepherd, Moore, Braun, Donner, 2007; Clark, Beesley, Holcombe, & Salmon, 2011; Salmon, Holcombe, Clark, Krespi, Fisher, & Hill, 2007). Past research shows, fairly consistently, that avoidantly attached individuals engage in high levels of distancing and low levels of support-seeking to cope with stressors (Holmberg, Lomore, Takacs, & Price, 2011; Mikulincer & Florian, 1995; Mikulincer, Florian, & Weller, 1993), which suggests that they maintain comparatively low levels of social support. Consistent with this circumstance, Kobak & Sceery reported that anxious and secure individuals enjoyed more social support than avoidant study participants (Kobak & Sceery, 1998; Kotler, et al. 1994). Further, research shows that securely attached adults are more capable of sustaining close relationships, and are more willing to seek support from others (Sadava, Busseri, Molnar, Perrier, & DeCourville, 2009; Florian, Mikulincer, & Bucholtz, 1995). Regarding the perception of support, Mikulincer and Shaver identified more than 40 independent studies collectively indicating that attachment style security consociates with perceived availability of support, greater confidence in the supportiveness of specific relationship partners, and greater satisfaction with support received (Mikulincer & Shaver, 2007). Some studies (e.g., Rholes, Simpson, Campbell, & Grich, 2001) found that at least some degree of accuracy characterized these perceptions (Mikulincer & Shaver, 2007). A separate study showed that attachment security predicted greater perceived support in end-stage cancer patients, which in turn predicted lower depression scores (Rodin, et al., 2007). Thus, lower perceived support may correspond to higher levels of stress—itsself a risk factor for negative health outcomes (Pietromonaco, et al., 2013; Tacón, 2002; Uchino, 2006; Sadava, et al., 2009; Diamond & Hicks, 2004; Schneiderman, Ironson, & Siegel, 2005).

Depression widely predicts poorer self-care, greater mortality, and increased microvascular and macrovascular complications in diabetics (Katon, et al., 2009b; Katon, et al., 2004), oftentimes prospectively (Lin, et al., 2010; Williams, et al., 2010; Sieu, et al., 2011; Katon, et al., 2009c). Numerous studies indicate that attachment style insecurity predicts, and precedes, the development of depression (e.g., Morley & Moran, 2011; Vilchinsky, Dekel, Asher, Leibowitz, & Mosseri, 2013; Marganska, Gallagher, & Miranda, 2013; Bifulco, Moran, Ball, & Lillie, 2002; Conradi & de Jonge, 2009; Bifulco, et al., 2006). Some researchers suggest that attachment insecurity constitutes a psychological factor that renders some individuals more susceptible to depressive symptoms when living with a chronic disease (Hinnen, Schreuder, Jong, Duijin, Dahmen, & van Gorp, 2012; Meredith, Strong, & Feeney, 2005). By contrast, Ciechanowski, et al. (2005) reported that changes in depression status, among a sample of individuals with diabetes, predicted statistically significant changes in attachment style status as measured by the RQ and the Relationship Scales Questionnaire. The changes accrued over a 10 month interval of time, which (based on attachment theory principles regarding stability) indicate that they more likely reflected the effects of measurement error, as opposed to a trust change in attachment style status. Regardless, this finding positions depression as a potential confounder in relationships between attachment style and diabetes health. Maunder and Hunter (2001) regard the attachment insecurity--major depression relationship as an important one in the study of physical disease because 1) depression often consociates with a worse course of physical illness, 2) depression potentially transpires as a result of severe attachment disruption, and 3) the respective physiological features of attachment insecurity and depression evidently overlap, such that the biopsychosocial concepts of depression and insecure attachment defy clean separation. On the basis of these observations, the article's authors advocate for controlling on symptoms of

depression in studies evaluating relationships between attachment style and disease (Maunder & Hunter, 2001).

Analogous to the relationship between depression and attachment style, anxiety disorders plausibly affect the ways in which individuals self-report their attachment style statuses on certain measures (e.g., the RQ). Some evidence shows that attachment style status predicts anxiety symptoms or anxiety disorder status (Esbjorn, Bender, Reinholdt-Dunne, Munck, & Ollendick, 2012; Meredith, et al., 2005; Bifulco, et al., 2006; Notzen, et al., 2015; Marganska, Gallagher, & Miranda, 2013). On the other hand, attachment system activation turns on the perception of threat, and the presence of an anxiety disorder modifies one's processing of threat-related information (Martin, William, & Clark, 1991; Mathews & MacLeod, 1985; Cisler & Koster, 2010). In the case of PTSD, evidence shows that people who suffer from the condition experience "persistent and exaggerated negative beliefs or expectations about oneself, others, or the world" and/or "[f]eelings of detachment or estrangement from others" (American Psychiatric Association, 2013), which suggests that PTSD prevails upon the manners in which individuals view others and/or themselves (i.e., the two dimensions underlying Bartholomew and Horowitz's conceptualization of attachment style). Complementary evidence maintains that the greater the threat to individuals' attachment figures' availabilities, the greater their levels of attachment-related anxiety or avoidance (Holman, Galbraith, Timmons, Steed, & Tobler, 2009).

Like depression, anxiety disorders may affect diabetes health. Several studies reported associations between PTSD and increased levels of maladaptive coping behaviors (e.g., smoking, alcohol abuse, illicit drug use) (e.g., Subica, Claypoole, & Wylie, 2012; Breslau, Davis, & Schultz, 2003; Cohen, Alfonso, Hoffman, Milau, & Carrera, 2001; Chiodini, et al., 2012; Boarts, Sledjeski, Bogart, & Delahanty, 2006), or HPA axis dysregulation (Miller, et al., 2011; Pitman,

et al., 2011; Edwards & Mezuk, 2012; Morris, Compas, & Garber, 2012), which leads to decreased baseline cortisol levels (Pitman, et al., 2012; Klaassens, Giltay, Cuijpers, van Veen, & Zitman, 2012) and other neuroendocrinological abnormalities that potentially affect glucose metabolism, in turn (Miller, et al., 2011; Edwards & Mezuk, 2012; Chiodini, et al., 2012). Trauma exposure is more prevalent in safety-net populations, such as the one that comprises the sample for this thesis' study, and frequently coincides with depression and diabetes in populations characterized by low socioeconomic statuses (Vanderlip, Katon, Russo, Lessler, & Ciechanowski, 2014). Symptoms of PTSD include socially withdrawn behavior and markedly diminished participation in significant activities (American Psychiatric Association, 2013), both of which lend themselves to diminished contact with healthcare providers. Lustman (1988) found that generalized anxiety disorder associated with poorer glucose control and increased reports of clinical diabetes symptoms. Additional research denotes that comorbid anxiety disorders and elevated anxiety disorder symptoms map to increased diabetes symptom burden, BMI, disability, pain, depression, and blood-glucose, and a reduced quality of life (Smith, et al., 2013), and links comorbid PTSD to occurrences of hyperlipidemia, obesity, and coronary heart disease (McFarlane, 2010; Mitchell, et al., 2013; Miller, et al., 2011; Smith, et al., 2013).

Attachment style differences arise with respect to individuals' appraisals of threats (Bartholomew, Cobb & Poole, 1997; Cassidy, et al., 2013; Sadava, et al., 2009). In health research, one study found that attachment anxiety in patients with chronic pain associated with appraisals of pain as more threatening (Meredith, Strong, & Feeney, 2005). Two studies found that insecure attachment, especially fearful attachment, related to levels of greater symptom-reporting (Ciechanowski, Walker, Katon, & Russo, 2002; Noyes, Stuart, Langbehn, Happel, Longley, Muller, & Yagla, 2003). Bazzazian & Besharat (2012) concluded that the degree to

which type 1 diabetics in their study adjusted to living with their illness depended on their perceptions of diabetes as more or less threatening, and on the nature of their coping styles, which in turn depended on attachment style. In a retrospective study of students who previously experienced missile attacks in the Gulf War, all insecure subjects reported higher levels of somatization (Mikulincer, Florian, & Weller, 1993). At the same time, some research attributes poor adherence among people with type 2 diabetes to misperceptions regarding the potential seriousness of the disease, and differences in how patients, as well as providers, understand the disease (Lawton, Peel, Parry, Araoz, Douglas, & Lay, 2005; Nam, et al., 2011).

Possibly akin to their purported effects on disease susceptibility and perceived threat of a disease, attachment styles differ with respect to individuals' symptom reporting behaviors and symptom intensity experiences (Maunder & Hunter, 2001). In one study, investigators found that participants with anxious attachment styles, from a community sample of individuals affected with arthritis, reported that they experienced significantly higher levels of physical pain than secure types (McWilliams, Cox, & Enns, 2000). McDonald and Kingsbury (2006) found similar outcomes in a sample that consisted of chronic pain affected patients and community volunteers, and Rodin, et al., detected an association between more severe physical symptoms and higher levels of attachment anxiety in patients seeking treatment for metastatic cancer (Rodin, Walsh, Zimmerman, Gagliese, Jones, Shepherd, Moore, Braun, Donner, & Mikulincer, 2007). Some researchers indicated that avoidant study participants reported more severe physical pain than participants with other attachment styles (Porter, Davis, & Keefe, 2007; McWilliams & Admundson, 2007). Across studies on pain experiences in participants who differed by attachment style statuses, insecure individuals generally reported higher levels of physical pain and psychological distress than their secure counterparts (Porter, et al., 2007;

Ciechanowski, et al., 2003; Davies, McFarlane, McBeth, Moriss, & Dicken, 2009; Meredith, Strong, & Feeney, 2006(a), Meredith Strong, & Feeney, 2006(b); Meredith, Strong & Feeney, 2007). Furthermore, Wearden, et al. found associations between increased symptom reporting and preoccupied or fearful attachment styles, but not the dismissing attachment style (Wearden, Lamberton, Crook, & Walsh, 2005). Besides pain, Ciechanowski, et al. indicated that fearful and preoccupied Hepatitis C patients reported an excess of medically unexplained symptoms compared to securely attached individuals with the same disease (Ciechanowski, Dwight, Katon, & Rivera-Ball, 1998).

This overview, heretofore, describes some of the evidence linking attachment theory to health or health-related outcomes. Further evidence exists for diabetes outcomes, in specific, and/or to the three factors that this thesis examines as potential mediators, individually: maladaptive coping behaviors, trust in the primary care physician, and visit frequency. The next sub-sections summarize the evidence in the literature about these relationships.

C. Evidence linking attachment theory to diabetes health

A number of studies, to date, examined attachment style correlates of health in populations comprised of type 1 and/or type 2 diabetic patients. One study found that diabetics with dismissing attachment styles demonstrated significantly worse glucose control (higher HbA1c values) than those with preoccupied or secure attachment styles (Ciechanowski, et al., 2001). Furthermore, among participants who took oral hypoglycemic medications to control their diabetes symptoms, those with a dismissing attachment style and poor patient-provider communication outcomes reported significantly worse adherence to their medication and glucose-monitoring regimens (Ciechanowski, et al., 2001). Consistent with these findings, Cohen, et al. reported that, among adults with type 2 diabetes, patients scoring high on

attachment avoidance viewed their interactions with their spouses as less supportive (Cohen, Birnbaum, Meychas, Levinger, Florian, & Mikulincer, 2005), and another study conducted among patients with type 1 diabetes found a strong association between dismissing attachment styles and higher HbA1c levels (Ciechanowski, Hirsch, & Katon, 2003). Also in type 1 diabetics, Turan, et al. reported associations between a dismissing attachment style and poor adjustment to diabetes, along with poor adherence to blood tests and insulin injection schedules (Turan, Osar, Turan, Ilkova, & Damci, 2003). In an additional study, approximately 1/3 of primary care diabetic patients identified themselves as having a dismissing attachment style (by comparison approximately 25% of the general population has a dismissing attachment style) (Ciechanowski, Russo, Katon, Von Korff, Ludman, Lin, Simon, & Bush, 2004; Ciechanowski, et al., 2002; Mickelson, Kessler, & Shaver, 1997). Relative to the participants with secure attachment styles, dismissing types presented to researchers with significantly lower levels of exercise, footcare, and adherence to healthful diets and oral hypoglycemic medications, along with significantly higher rates of tobacco smoking (Ciechanowski, et al., 2004). Mediation analyses in the same study suggested that attachment style differences in patient-provider relationships (i.e., degrees of collaboration) mediated the associations (Ciechanowski, et al., 2004). Likewise, compared to the secure study participants, preoccupied participants demonstrated lower/better HbA1c outcomes (Ciechanowski, et al., 2004), consistent with the findings of a separate study, in which preoccupied study participants reported significantly more health care visits and physical symptoms than their securely attached counterparts (Ciechanowski, Walker, Katon, & Russo, 2002). Researchers in another study used a mixed methods design to determine that a subset of diabetic participants with dismissing and fearful attachment styles reported low levels of trust in other people, and difficulties in collaborating

with their health care providers throughout their ongoing relationships (Ciechanowski & Katon, 2006). Furthermore, individuals with night-eating behaviors (i.e., consistent with night-eating syndrome), from a sample of type 1 and type 2 diabetics, appeared more likely to have insecure attachment styles as compared to individuals without night-eating behaviors, where night-eating syndrome likely affects diabetes health adversely (Morse, Katon, Ciechanowski, Hirsch, 2006). Importantly, Ciechanowski, et al. (2010) found an increased risk of death among diabetic individuals with an “independent” attachment style patterns (combined fearful and dismissing attachment styles), as compared to those with an “interactive” attachment style patterns (combined preoccupied and secure attachment styles) (hazard ratio = 1.20; 95% C.I. 1.01-1.43), and finally, Ciechanowski, et al. showed that dismissing diabetics without major depression missed more scheduled primary care appointments than non-depressed secure diabetics (Ciechanowski, Russo, Katon, Simon, Ludman, Von Korff, Young, & Lin, 2006). Congruent with the majority of these findings, Brenk-Franz, et al. (2015) found negative associations between the attachment avoidance dimension (as measured by the ECR-RD) and coping, self-efficacy, social support, and healthcare use in type 2 diabetic patients with hypertension and one or more comorbid chronic condition(s) (Brenk-Franz, Strauss, Tiesler, Fleischhauer, Ciechanowski, Schneider, & Gensichen, 2015). However, they also found a positive association between attachment anxiety and motivation to change, and negative associations between attachment anxiety and coping, self-efficacy, dietary control, and physical activity (Brenk-Franz, et al., 2015). Taken together, it appears that individuals’ attachment styles cogently affect their diabetes health outcomes, with a dismissing attachment style recurrently predicting some of the worst diabetes outcomes.

D. The limitations of current research on health or diabetes and attachment theory

Before continuing on to a discussion of evidence in connection with the potential mediators between attachment style and diabetes health that is the focus of this thesis, the current subsection considers the nature of several limitations pertaining to the extant research about attachment theory and diabetes health, and/or health in general. This thesis aims to build on the findings of the evidence reviewed in the antecedent subsection, taking as its starting point the idea that dismissing attachment styles hypothetically expose affected individuals to higher risks of sustaining negative diabetes health outcomes. However, it acknowledges that certain elements of the studies that produced this evidence threaten the validity of their contingent findings, and that the premise of dismissingness as a singularly deleterious attachment style exposure for diabetes health potentially constitutes a premature assumption.

First, the testing of attachment-related hypotheses in studies of health or medical outcomes is discomfited by conceptual and measurement complexities that emanate from research in the field of attachment theory (refer to sections 2.III.B.-2.III.C. of this thesis) (Maunder, Panzer, Viljoen, Owen, Human, & Hunter, 2006). The same issues that attachment theorists confront over the course of their attempts to measure and define attachment style constructs in adult populations often pertain to attachment theory studies in health and medicine, where the goal most often consists of elucidating attachment style differences in illness-specific outcomes or health behaviors among adult medical patients affected by one more physical illnesses. Just as in psychology research, the thoughtful selection of a measure for ascertaining participants' attachment styles, and the methods for analyzing resultant data, require that researchers make deliberate decisions about how their respective studies conceptualize attachment style.

Furthermore, health and medical studies oblige researchers to consider whether presenting their particular findings in terms of attachment style categories or attachment style dimensions best supports the realization of their explicitly stated aims. Studies with smaller sample sizes also elicit concerns that may factor into an individual researcher's decision to use one type of attachment style measure over another, or to utilize a particular set of methods for analyzing their data. Fraley and Waller (1998) cited such a concern among their arguments for abandoning categorical measures of attachment style altogether, and their proposal that researchers in the field of attachment theory exclusively rely on graduated measures of attachment style in their studies (Kurdek, 2002). Several practical limitations frequently restrict the numbers and types of attachment style measures that researchers can feasibly include in their instruments. Altogether, these issues substantially contribute to the immoderate degree of variability across studies of methods and measures for assessing attachment styles and their relationships with physical health outcomes.

Frequent differences occur between studies, amid existing research on attachment theory and health or medicine, in investigators' choices and usages of attachment style measures (Meredith, Ownsworth, & Strong, 2008; Porter, Davis, & Keefe, 2007). The majority of studies involve a 3-category model of attachment style (e.g., avoidant, anxious, and secure) (e.g., Hunter & Maunder, 2001; McWilliams & Bailey, 2010; Feeney & Ryan, 1994; Puig, Englund, Simpson, & Collins, 2013; Kaati, Vester, Sjostrom, & Bygren, 2001), but a considerable number of studies use 4-category/2-dimensional models (e.g., Scharfe & Eldredge, 2001; Sadava, Busseri, Molnar, Perrier, & DeCourville, 2009; Maunder, et al., 2006; Ciechanowski, et al., 2003; Meredith, Strong, & Feeney, 2006; Meredith, Strong, & Feeney, 2007) or 2- category models (e.g., secure vs. insecure attachment styles; anxious vs. avoidant dimensions) (e.g., Wearden, Cook, &

Vaughan-Jones, 2003; Brenk-Franz, et al., 2015). Researchers in some studies employ novel/incomparable measures of attachment style. For example, Ciechanowski, et al. used a 2-category attachment style measure with novel categories—one that combined dismissing and fearful individuals, which the researchers called an “independent” relationship style, and another that combined preoccupied and securely attached individuals, that the researchers referred to as an “interactive” relationship style (Ciechanowski, et al., 2006; Ciechanowski, et al., 2010). By combining the secure and one insecure type into one of the two categories, this measure obscures an important distinction that a large body of evidence continually affirms—a bright line that separates secure from insecure attachment styles, in terms of the natures of their corresponding outcomes. In another example, Schmidt, et al., assessed participants’ health outcomes relative to a unique, 5-category model of attachment style (Schmidt, Nactigall, Wuetherich-Martone, & Strauss, 2002). Such differences in attachment style measures render the already complicated task of meaningfully comparing results across studies formidably difficult.

Most studies on attachment theory in health in medicine utilize self-report measures of attachment style (e.g., Rosenberg & Shields, 2009; Cohen, Birnbaum, Meychas, Levinger, Florian, & Mikulincer, 2005; Ciechanowski, et al., 2002; Ciechanowski, et al., 2004; Martinez, Miro, Sanchez, Mundo, & Martinez, 2012). However, a small number of such studies use interview-based measures as a means of assigning attachment styles to participants (e.g., Holwerda, Sanderman, Pool, Hinnen, Langedik, Bemelman, Hagedoorn, & Sprangers, 2013; Bazzazian & Besharat, 2012). Furthermore, an emerging debate centers on the question of whether it matters what particular type of insecure attachment style a patient identifies themselves as having, for determining health-related outcomes, or merely the severity of their insecure attachment, regardless of its type (Maunder & Hunter, 2012).

A host of additional issues detract from the conclusiveness of findings from attachment style research, at present. The vast majority of such studies test their hypotheses using cross-sectional data (e.g., Gauthier, Rodin, Zimmermann, Warr, Librach, Moore, Shepherd, & Gagliese, 2012; Scharfe & Eldridge, 2001; McWilliams & Bailey, 2010; Ciechanowski, et al., 2002; Ciechanowski, et al., 2004), which precludes any opportunity for interpreting the results in a causal manner. Much of the currently available research that supports relationships between adult study participants' attachment styles and their tendencies to engage in risky or beneficial health behaviors stems from studies that researchers conducted in small or specialized samples (Maunder, et al., 2006; Ciesla, Roberts, & Hewitt, 2004; Sadava, Busseri, Molnar, Perrier, & DeCourville, 2009; Brenk-Franz, 2015), or in samples wherein participants' ages fell within narrow ranges (e.g., Kassel, et al., 2007; Kostecky, 2005). For example, in a number of studies investigators assessed the attachment style differences in alcohol or substance abuse behaviors of participants who they recruited from university or college campus settings (e.g., Kassel, Wardle, & Roberts, 2007; McNally, Palfai, Levine, & Moore, 2003; Vungkhanching, Sher, Jackson, & Parra, 2004; Sadava, et al., 2009). Not only were the participants in these studies very similar to one another in age, but most of them resided at stage in their lives, developmentally, and in a particular environmental setting, socially, where wider variations in substance abuse likely existed, compared to those which occur in older, more mature, and more diverse populations of adults. Moreover, the results from a large proportion of available studies that assessed relationships between attachment style and physical health behaviors or outcomes rely on samples comprised of relatively young study participants (e.g., McWilliams & Asmundson, 2007; Scharfe & Eldredge, 2001; Kotler, Buzzwell, Romeo, & Bowland, 1994; Feeney & Ryan, 1994; Rosenberg & Shields, 2009). This poses a problem for investigators whose interests lie in

studying the outcomes of medically ill adults, given that the risk of dying from most diseases tends to increase with age.

Researchers in attachment theory studies of health-related outcomes employ a variety of sub-optimal, or even inappropriate, methods. In some cases, researchers opted to use subjectively defined cut-points for their outcome or exposure variables, derived from means, medians, or inter-quartile/inter-tercile ranges of observations (e.g., Ciechanowski, et al., 2005; Ciechanowski, et al., 2004; Ciechanowski, et al., 2006(a); Blackstock, Addison, Brennan, & Alao, 2012; Maunder, Lancee, Hunter, Greenberg, & Steinhart, 2005; Cohen, et al., 2005; Porter, Keefe, Davis, Rumble, Scipio, & Garst, 2012, McWilliams & Admunson, 2007; Fenton, Von Korff, Lin, Ciechanowski, & Young, 2006; Ciechanowski, Sullivan, et al., 2003; Ciechanowski, et al., 2002, Gick & Sirois, 2010; Ahrens, et al., 2012; Taylor, Marshall, Mann, & Goldberg, 2012). This approach limits the generalizability of the resultant findings, and essentially involves testing data-driven hypotheses that relate specifically to the participants of a given study. Likewise, researchers frequently used data-driven approaches to select covariates for inclusion in their studies, sometimes in tandem with covariates that they selected on the basis of their scientific reasoning (e.g., Ciechanowski, et al., 2001; Ciechanowski, Hirsch, & Katon, 2002; Ciechanowski, et al., 2002; Puig, et al., 2013; Gick & Sirois, 2010; Ciechanowski, Katon, Russo, & Dwight-Johnson, 2002; Ciechanowski, et al., 2006; Morse, et al., 2006; Sullivan, et al., 2009; Meredith, et al., 2007; Holwerda, et al., 2013; Porter, et al., 2012; Sockalingam, Blank, Jarad, Alosaimi, Hirschfield, & Abbey, 2012; Fenton, et al., 2006; Taylor, et al., 2012; Brenk-Franz, 2015). For example, Ciechanowski, et al. repeatedly used ANOVA or ANCOVA and chi square tests to compare variables between respondents from different attachment style groups, and then adjusted their regression models for covariates that significantly differed between the attachment

style categories (Ciechanowski, et al., 2001; Ciechanowski, et al., 2002a; Ciechanowski, et al., 2006a; Morse, et al., 2006). This method further limits the generalizability of studies' results and, perhaps more importantly, it provides no way of determining whether the potential confounders identified by ANOVA/ANCOVA and chi-square tests fall in the causal pathways between their associated outcomes and exposures. If researchers adjust on covariates that do fall in causal pathways, then their study's main effects estimates likely fall prey to significant overadjustment bias. This either increases the net bias of their results or decreases the precision of their estimates without affecting bias (Schisterman, Cole, & Platt, 2009). Selecting covariates on the basis of scientific reasoning, as opposed to data, at the very least promotes the deliberation of assumptions that underlie the variables' ordinations as potential confounders or effect modifiers.

In studies that adjust for covariates in regression models, covariates often stand in direct contradiction to researchers' explicitly stated assumptions about attachment style stability. For example, researchers in four cross-sectional studies (Ciechanowski, et al., 2002(a); Ciechanowski, et al., 2002(b); Ciechanowski, 2004; Ciechanowski, 2006(b)), and one prospective longitudinal observational study (Brenk-Franz, et al., 2015) of adult participants interpreted their results as consistent with the premise that attachment styles remain highly stable across the life course (e.g., participants' attachment styles predicted their health outcomes) (Brenk-Franz, et al., 2015 adopts the assumptions outlined in Maunder & Hunter's (2001) model of attachment and disease), yet they included among their covariates manifold factors such as concurrent obesity status, the number of diabetes complications, comorbidity, marital status, diabetes medications prescribed, diabetes type, number of chronic diseases diagnosed by the general practitioner, income level, and diabetes knowledge. Confounders, by definition,

influence both the exposures and outcomes. With attachment style as the main exposure in all cases, Ciechanowski, et al.'s studies, therefore, *implicitly* assumed that each covariate may influence attachment style, while *explicitly* assuming that attachment styles remained highly resistant to change over long periods of time (e.g., since infancy). That an individual's attachment style may be significantly influenced by what type diabetes medication their doctor prescribes to them in adulthood, however, seems implausible (to say the least) based on attachment theory's enduring principles. The utility of this research largely turns on the validity of this latter assumption, as Maunder and Hunter explain, “[f]or individual differences in attachment style to have a substantial impact on adult health, patterns of attachment must be relatively enduring, trait-like characteristics that influence health status beyond the first few years” (Maunder & Hunter, 2008).

Several attachment theory studies of diabetic populations combine outcomes from type 1 and type 2 diabetics, which attenuates the reliabilities and generalizabilities of their findings. Individuals affected by the two types of diabetes appear to differ from one another in important ways which pertain to their physiological and psychological experiences of their illnesses (Ciechanowski, Katon, Russo, & Hirsch, 2003; Turan, Osar, Molzan Turan, Damci, & Ilkova, 2002). Ciechanowski, et al. found a significant association between depression and HbA1c levels in type 1 diabetics, but not in type 2 diabetics (Ciechanowski, et al., 2003), and other studies reported differential associations for depression with HbA1c levels between diabetes subtypes (e.g., Lustman, Anderson, Freeland, de Groot, & Carney, 2000; Van Tilburg, McCaskill, Lane, Edwards, Bethel, Feinglos, & Surwit, 2001). Ciechanowski, et al. stated that a number of substantive differences between type 1 and type 2 diabetes—etiologies, ages of onset, and treatment regimens—potentially contributed to these results (Ciechanowski, et al., 2003).

The authors argued that the complete insulin deficiency of type 1 diabetes may result in greater lability in glycemic control in response to behavioral or neuro-hormonal effects of depression, compared to type 2 diabetics (Ciechanowski, et al., 2003). In fact, other researchers propose, and evidence exists to support, the hypothesis that psychosocial factors in general affect the diabetes outcomes of type 1 diabetics more strongly than they affect those of type 2 diabetics (Turan, et al., 2002). Proponents of this perspective contend that the residual capacity for insulin production which eventuates in type 2 diabetes partially protects the affected individuals from the negative influences of psychosocial risk factors (Turan, et al., 2002). Attachment theory studies that combined data from type 1 and type 2 diabetics, therefore, derived their conclusions about associations between diabetes health outcomes and attachment styles, or other psychosocial risk factors, from their analyses of participants affected by, not a single disease of interest, but rather a heterogeneous mixture of two (or more) diseases that occurred in various proportions. In many of these cases, only a minimal degree of bias likely resulted from the approach, as one type of diabetes clearly predominated in each sample (e.g., Ciechanowski, et al., 2001; Ciechanowski, et al., 2004; Ciechanowski, et al., 2005; Ciechanowski, et al., 2006(a)). However, some studies' researchers based their conclusions on results from testing their hypotheses in samples where significant proportions of participants differed according to their diabetes types (e.g., 42% type 1 and 58% type 2 diabetics in Morris, Berry, Wearden, Jackson, Dornan, & Davies, 2009; 58% type 1 and 42% type 2 diabetics in Morse, et al., 2006). Furthermore, the fact that diabetes manifests during childhood for the majority of type 1 diabetics (ADA, 2013a) and during adulthood for most type 2 diabetics takes on a special significance, when considering that research shows that childhood experiences of physical illness or pain play distinct roles in determining attachment style outcomes (e.g., Feeney, 1999; van

Ijzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992; Goldberg, Gotowiec, & Simmons, 1995; Feeney & Ryan, 1994). Potential mechanisms for such putative associations include not only the direct effects of the diseases themselves on individuals' attachment experiences, but also the diseases' effects on the ways that individuals' parents/caregivers responded to them in various attachment-related situations (van Ijzendoorn, et al., 1992; Feeney & Ryan, 1994; Feeney, 1999). In other words, type 1 diabetics may have influenced the developments of their attachment styles, partially, as a *result* of their diabetes pathologies and symptoms, while attachment theory studies of adult diabetics generally assume the opposite directionality, wherein participants developed diabetes after they formed their primary attachment styles.

Most studies about attachment style and health or diabetes remain silent on the issues of missing data and multiple comparisons. With regards to the former, many of these studies used all available data to test their hypotheses, so that each individual result applies to a different subsample of a given study's participants (e.g., Maunder, et al., 2005; Maunder, et al., 2006; Morse, et al., 2006; Ciechanowski, et al., 2001; Ciechanowski, et al., 2006(a)). This approach, known as available-case analysis (Gelman & Hill, 2006), greatly complicates the interpretation of results or even qualifies as misleading. It potentially produces invalid estimates due to varying samples used for estimating parameters (Pigott, 2001). Some studies reported using specific cut-points for excluding their participants with missing data. For example, Bazzazian and Besharat (2012) excluded data from forty of their participants, who failed to respond to at least 60% of the items that the researchers included in their questionnaire. Sadava, et al. (2009), likewise, included all participants who completed at least 70% of the items on their questionnaires, and other researchers decided to exclude participants with missing data from their outcomes for a particular measure (e.g., Ciechanowski, et al., 2010 excluded participants missing a depression

measure; Ciechanowski, et al., 2004 excluded participants missing an attachment style measure) (this latter approach also constitutes available-case analysis). Some researchers chose not to exclude participants with missing data, but rather to employ multiple imputation techniques for producing imputed data sets (e.g., Puig, Englund, Simpson, & Collins, 2013; Brenk-Franz, 2015). The utilization of arbitrary cut-points for including/excluding observations with missing data in statistical analyses negatively impacts the generalizability of studies' findings, and potentially yields another type of bias. The current thesis uses complete-case analysis—the standard approach for handling missing data—which excludes any subjects with any missing values in any of the variables included in at least one analysis (Raghunathan, 2004; Gelman & Hill, 2006; Ware, Harrington, Hunter, & D'Agostino, 2012). Complete-case analysis ignores partial information from subjects with incomplete data (inefficient) and sometimes leads to biased estimates with larger standard errors, due to reduced sample sizes (Gelman & Hill, 2006). Additionally this approach rests on the assumption that data are missing completely at random (often not the case in practice) (Pigott, 2001). Violations of this assumption result in inaccurate study estimates (Pigott, 2001).

i. A special case: comorbidity indices

Perhaps the most troubling (and common) practice in studies of attachment style and diabetes outcomes involves researchers' usages of comorbidity index measures for adjusting on covariates that aim to capture overall disease status (e.g., severity) or disease burden. At present, a relatively small number of studies focus explicitly on attachment style differences in adults' diabetes health outcomes and, among those that do, several adjusted their main effects estimates for some measure of participants' comorbidity statuses (e.g., Ciechanowski, et al, 2001; Ciechanowski, et al., 2002(a); Ciechanowski, et al., 2004; Ciechanowski, et al. 2005; Holwerda,

et al., 2013; Ciechanowski, et al., 2006; Ciechanowski, et al., 2010; Brenk-Franz, 2015). Therefore, the issues addressed in this subpart of the thesis speak to the general quality of existing evidence on attachment style and diabetes health, and they inform the analyses undertaken in the concurrent study.

Comorbidity status potentially affects diabetes health through a number of mechanisms: Comorbid illnesses ostensibly delay diagnoses, influence treatment decisions, modify complications, and alter survival (Hall, S.F., 2006). Congruent evidence in diabetes research points to a need for controlling on comorbidity status, as a means of reducing confounding, in studies that explore relationships between an exposure plausibly affected by comorbidity status and a diabetes health outcome (described in the paragraph below). However, comorbidity adjustment affects the results of associated statistical analyses in a variety of ways; when considering these effects coextensively, the relevant question becomes not whether including measures of comorbidity status and/or disease severity as confounders in statistical models makes sense, theoretically, but whether such an approach likely produces more or less useful/accurate study results.

Research shows that total disease burden (either positively or negatively) affects the degrees to which diabetic individuals adhere to their treatment regimens (Dezii, Kawabata, & Tran, 2002; Dailey, Kim, & Lian, 2001; Jerant, von Friederichs-Fritzwater, & Moore, 2005; Bayliss, et al., 2003; Nam, Chesla, Stotts, Kroon, & Janson, 2011; Bayliss, et al., 2003; Bayliss, Ellis, & Steiner, 2007; Ou, et al., 2012; Kerr, et al., 2007; Sharry, Bishop, Moss-Morris, & Kendrick, 2013). Studies that explored the relationship between comorbidities and glycemia control reported mixed findings—some found the presence of comorbidities related to glycemia control, and others found no association (Hudon, Fortin, Dubois, & Almirall, 2008). Hudon, et al. (2008)

observed that studies falling into the former category adjusted on comorbidity indices that contained a limited number of diseases or diseases closely associated with diabetes exclusively (e.g., Zhang, et al., 2000; Weiner & Long, 2004; Suh, Kim, Choi, & Plauschinat, 2008), while studies falling into the latter category adjusted on more comprehensive comorbidity measures (e.g., Hudon, et al., 2008; El-Kebbi, et al., 2001). Although some evidence supports the idea that greater disease burdens or more complex treatment regimens lead to lower adherence, countervailing research contends that patients with higher comorbidity burdens may receive better care (Ou, et al., 2012; Hudon, et al., 2008; Halanych, et al., 2007; Clark, Weir, Ouellette, Zhang, & Baxter, 2009), and/or sustain greater levels of motivation to engage in health-promoting behaviors (Corser, 2013). This concords with research that shows patients with more chronic illnesses as reporting higher levels of overall satisfaction (Carlin, Christianson, Keenan, & Finch, 2012). These findings contribute to a perspective that favors adjusting on comorbidity indices in diabetes research; the following subparts of this thesis lay out the reasons for not doing so—particularly in studies of relationships between attachment style statuses and certain diabetes health outcomes.

a. Issues attending applications of comorbidity indices in health-related research

The concept of comorbidity appears, in some sense, as a deceptively simple and objective one, but in another sense as exceedingly complicated and remarkably subjective (Corser, 2013; Schneeweiss & Maclure, 2000). Comorbidity indices attempt to capitalize on the idea of “confounder summarization,” the aim of which consists of defining, for example, a single continuous variable that captures all relevant information on various comorbid diseases’ potential confounding properties, understood within the context of a given study (Ording &

Sorenson, 2013; Miettinen, 1976). They represent complex functions of the numbers and severities of comorbid diseases that each individual lives with, relative to some primary diagnosis of interest (i.e., the “index” disease), at a given time. Therefore, including comorbidity indices in statistical analyses, as opposed to outcomes for individual diseases, holds the potential to improve the related model’s statistical efficiency (de Groot, et al., 2003). Nonetheless, the contributions of many diabetic adults’ prevalent comorbid conditions, along with their diabetes, generally fails to account for the variations observed in their outcomes on self or other-rated measures of their health statuses, among those who manifest apparently similar combinations of comorbid conditions; moreover, that the effects of controlling on a comorbidity index potentially vary in accordance with certain conceptual distinctions that concern the diseases that it interrogates (e.g., whether they encompass more concordant or more discordant types of diseases, in terms of their management demands) belies a complexity that lies just skin deep (Corser, 2013). The conceptual and methodological differences between various comorbidity indices reflect the prismatic nature of issues that accompany their usages in health-related research, and the considerable degree of subjectivity involved in interpreting “comorbidity status” in clinically meaningful terms.

No single approach to measuring and defining the concept of comorbidity status clearly emerges as the “gold standard” at present (Ording & Sorenson, 2013; Ou, Mukherjee, Erickson, Piette, Bagozzi, & Balkrishnan, 2012; Baser, Palmer, & Stephenson, 2008; Schneeweiss & Maclure, 2000). For example, some comorbidity indices include mental health diagnoses thought to influence the outcomes of individuals affected by a medical disease of interest (e.g., Dickinson, Dickinson, Rost, Degruy, Emersmann, Froshaug, Nutting, Meredith, 2008; Valderas, Starfield, Sibbald, Salisbury, & Roland, 2009; Kay-Lambkin, Baker, & Lewin, 2004;

Piette, Richardson, & Valenstein, 2004), while others only inquire about physical illness diagnoses (e.g., Charlson, Pompei, Ales, & McKenzie, 1987). Some comorbidity indices create an overall score for each study participant based on simple counts of their contributing diseases and/or collect the associated data via self-report (e.g., Crabtree, Gray, Hildreth, O'Connell, & Brown, 2000). Others, by contrast, ascertain comorbidity from administrative data on participants' disease diagnosis or health services utilized, and/or weight included conditions according to type, severity, risk of mortality, or other factors before combining them to generate an overall score for each participant (e.g., Charlson, et al., 1987; Lash, Mor, Wieland, Satariano, & Silliman, 2007; Baldwin, Klabunde, Green, Barlow, & Wright, 2006). Advantages of using administrative data for generating comorbidity statuses include the fact that they reflect both the types and the qualities of information available to treating physicians. In other words, administrative data capture the impact of known coexistent diseases on the medical decision-making of treating physicians for participants included in study, and this plausibly affects the researcher's conclusions (Lash, et al., 2007). On the other hand, self-reported data on comorbidity status tend to correlate well with participants' medical records (Ash, Porell, Gruenberg, Sawitz, & Beiser, 1989), and they often lend themselves to more complete study data (Lash, et al., 2007). Research promulgates evidence as to the reliabilities and validities of some comorbidity indices in some circumstances, while for other indices insufficient data on their clinimetric properties exist for evaluating their validities and reliabilities. For example, the most extensively studied comorbidity index—the Charlson Index—and its several adaptations are considered valid and reliable measures in cases where mortality prevails as the outcome of interest (de Groot, et al., 2003). However, the predictive performance of a comorbidity index varies according to the outcome and population of interest (Ou, et al., 2012; Sharabiani, Aylin, &

Bottle, 2012; de Groot, Beckerman, Lankhorst, & Bouter, 2003). Consequently, the selection of a comorbidity index measure should be specific (and apropos) to the outcome of interest, population, and source data utilized in the associated study (Ou, et al, 2012; de Groot, et al., 2003). Research also shows that the magnitude of an association between comorbidity status and glycemia control in people with diabetes may be influenced by the types of conditions included on the affiliated comorbidity index (or indices), and by their severities (Hudon, Fortin, Dubois, & Almirall, 2008).

Measures that assess comorbidity as a function of simple, unweighted counts of diseases essentially consider the effect of each disease on a study's outcomes as equal across all diseases and all participants. As a result, such measures treat, for example, a patient with comorbid hypertension and arthritis as "sicker" than another patient with only comorbid lung cancer. Simplicity comprises both the major advantage and the major disadvantage of using measures of this type: they ease the computational difficulty associated with more complex comorbidity indices, but they also mask the true complexity of comorbidity (Lash, et al., 2007). Oftentimes, including a comorbidity index score from a measure based on unweighted counts of diseases reduces a study's capacity for predicting outcomes (Corser, 2013). The analytic strategies that researchers apply in connection with such measures also tend to force linear relationships between study variables on an ordinal scale, across their entire ranges (Lash, et al., 2007). Consequently, as a given participant increases from zero to one in their number of comorbid conditions, the majority of a comorbidity effect may be realized, such that additional comorbid diseases impact the study's results in diminishing increments (Lash, et al., 2007). Importantly, unweighted count-based comorbidity indices ignore interactions between different types of diseases, or specific diseases that potentially affect studies' results to a degree that differs from

their simple sums (Lash, et al., 2007). However, to some extent, all comorbidity indices assume additive relationships between their included diseases (Lash, et al., 2007).

In more complex comorbidity indices, weighting schemes tend to produce overly specific results. Nonetheless, investigators found in one study which compared four comorbidity indices' relative capacities for facilitating accurate predictions that no single measure outperformed the others, but also that when they aggregated comorbid diseases according to the only weighted comorbidity index included in the study into a simple count of comorbidities for each participant, the performance of this measure deteriorated considerably (Baldwin, et al., 2006). Consistent with this finding, investigators in a separate review article compared the performances of different, weighted comorbidity indices (each adapted from the Charlson Comorbidity Index (CCI)) across multiple studies that previously employed them for studying outcomes in relation to various index diseases, and they found that the best-performing measures assigned study-specific weights, derived by researchers, to their included diseases, instead of using the original weight values derived by the authors of the CCI (Schneeweiss & Maclure, 2000). This indicates that the effectiveness of a given comorbidity index depends on factors specific to the conditions of a particular study (e.g., the particular study population) (Schneeweiss & Maclure, 2000; Holman, Preen, Baynham, Finn, & Semmens, 2005; Ou, et al., 2012). In general, evidence suggests that adjusting on appropriately weighted comorbidity indices, compared to those that use unweighted counts, reduces the degree to which employing such measures potentially distort associated study results.

Comorbidity indices select and weight their diseases according to various criteria. One index might focus on particularly high risk medical conditions (Desai, Bogardus, Williams, Vitagliano, & Inouye, 2002), while others focus on the differential rates of included diseases in a particular

target population (e.g., Fleming, Pearce, McDavid, & Pavlov, 2003), the 100 most frequently reported comorbid medical conditions (e.g., Holman, et al., 2005), or another criterion. Historically, studies employing comorbidity indices convened on mortality as the primary condition of interest, and researchers recruited their participants from hospital care settings (Schneeweiss & Maclure, 2000; Corser, 2013). More recently, researchers began to apply comorbidity indices to studies of chronic diseases, and patients outside of hospital settings, where their results rest on assumptions that such indicators represent meaningful proxies for “total disease burden” (e.g., Baser, et al., 2008; Levinson & Druss, 2005; Katon, Von Korff, Lin, Simon, Ludman, Russo, Ciechanowski, Walker, & Bush, 2004; Ciechanowski, et al., 2002; Yang, Thumula, Pace, Banahan, Wilkin, & Lobb, 2009). In turn, some research shows that total disease burden affects treatment adherence, or other disease outcomes (Ou, et al., 2012; Kerr, et al., 2007). Problems, therefore, arise when researchers use comorbidity indices developed for studies of mortality in hospital patients to quantify total disease burden. Some newer indices aim to address this issue by grouping together diseases with similar treatments or overlapping symptoms, and restraining their effect sizes to reflect participants’ statuses on more discordant types of diseases (e.g., Kerr, et al., 2007). However, doing so exacerbates the problem of gauging comorbidity status’ actual significance. Even when a study’s researchers weight participants’ scores according to some objective criteria for total disease burden, similarly diagnosed individuals often vary from one another, substantially, in terms of their subjective experiences of disease burden (Corser, 2013; Kerr, et al., 2007). Presently, insufficient research exists on which to base full appreciations of the myriad ways in which comorbid conditions affect diabetics’ adherence to their treatment regimens, or other health outcomes (Corser, 2013).

The ease of stating one’s study results in terms of “adjusted for on an overall comorbidity index score” belies the true complexity intrinsic to such scores, which in actuality reflect the presences or absences of numerous medical diagnoses (e.g., for 19 different diseases on the CCI)—each with its own complicated, known, and unknown relationships to the primary disease of interest. Comorbidity indices, in all likelihood, render the precise scientific interpretations of their associated studies’ findings unclear. Some experts suggest that effectively using comorbidity indices necessitates applying more than one of the measures in a given study, and combining data from multiple sources (e.g., utilizing both medical records and self-report comorbidity data in a given study) (Lash, et al., 2007; Baldwin, Klabunde, Green, Barlow, & Wright, 2006; Baser, Palmer, & Stephenson, 2008), although researchers rarely comply with this guideline in practice. Best practices for using comorbidity indices also entail conducting sensitivity analyses, as a means of adjusting a study’s estimates of effect for errors in disease classification (Lash, et al., 2007; Baldwin, et al., 2006). This emphasizes the importance of selecting data collection methods that ensure the independence of any errors from recall or reporting biases.

Equally compelling limitations arise when reflecting on objective definitions of comorbidity—those which delineate the boundaries of the construct as distinct from all others in clinical epidemiology. To clarify this point, consider a definition of comorbidity that usefully emphasizes properties setting it apart from two related concepts; Ording & Sorensen, 2013 write that:

“We suggest that the “index disease” describes the main condition under study, while “comorbidity” describes medical conditions that exist at the time of diagnosis of the index disease or later, but that are not a consequence of the index disease. In contrast, “multimorbidity” can be described as the existence of two or more chronic diseases. “Complications” of an index disease are adverse events occurring after diagnosis of the disease. “Case-mix” . . . is a measure of the complexity of illness used in health research or in clinical medicine as, for example, a clinical prediction score”.

The authors further acknowledge the types of complexities that sometimes occur when attempting to distinguish between complications and comorbidities, and note that such evaluations often require the use of external data sources (Ording & Sorensen, 2013; Goldfield, 2010). A relatively extreme version of this problem frequently exists in studies of type 2 diabetes, as a result of the index disease’s long and protracted pathogenic course and the limited specificity of its complications (e.g., heart failure, stroke, kidney disease). Notwithstanding this fact, Ording and Sorensen note that failures to separate complications from comorbidities in studies of diseases such as type 2 diabetes pose a serious threat to epidemiological research. They argue that:

“[C]omplications are . . . intermediate steps in the pathway from an exposure to an end point. Therefore, they must be considered separately from comorbidities. Otherwise the total comorbidity burden would be overestimated and misclassification of information about comorbidity would be introduced. If complications are regarded as confounders, some of the effect between the exposure and the outcome is masked, resulting in distorted estimates of association” (Ording & Sorensen, 2013).

Multiple studies of diabetes and attachment theory incorporate comorbidity indices into their analyses. Therefore, the issues addressed in the current subpart of this thesis likely affect the quality of evidence from the limited body of research available on attachment theory and diabetes, and should be taken into account in this study.

Surmising the exact effects of comorbidity indices on research about attachment styles and diabetes requires conducting one or more separate, future studies that focus on the degree(s) to which comorbid conditions influence the attachment style-diabetes outcome relationship(s) (if it (or they) exist(s)). The discussion carried forth in this subsection of the current thesis qualitatively weighs some potential benefits of administering certain comorbidity adjustment methods (and/or comorbidity adjustment methods in general), in the context of extant and future research on diabetes and attachment style constructs, against some viable harms of doing so. While limited in its capacity to facilitate definitive conclusions about the relative effects of adjusting, or not adjusting, on comorbidity indices, the analysis arguably advances more sophisticated (in the sense of more intricate or granular) perspectives as to the scientific merit of contemporary attachment-diabetes research, and the competence of this study's approach (i.e., not adjusting on the available comorbidity index), along with its attendant justifications.

b. Applications of comorbidity indices and similar measures in research on attachment theory and diabetes

In order for a variable to represent a potential confounder, it must be related to both the exposure of interest and the outcome of interest, and not fall within the causal pathway (Weiss & Koepsell, 2014). This means that, in analyses where attachment style serves as the exposure of interest, and some kind of health outcome constitutes the outcome of interest (as is the case in all of the studies reviewed in this subpart), the potential confounder (e.g., comorbidity status) must “cause” attachment style status. This conceivably occurs if one ascribes to the following view: Activation of the attachment system only occurs in the presence of a relevant threat, and/or attachment style severity varies as a function of the activating threat's (subjective) severity (e.g., Holman, et al., 2009), and the physical illnesses included on the comorbidity index qualify as

attachment-relevant threats. In service of a contrary contingency, some preeminent attachment theorists consider attachment style behaviors in adults as chronically present, regardless of whether attended by a relevant threat (e.g., Mikulincer & Shaver, 2007). Alternatively, diabetes health plausibly affects attachment style status in some individuals, when viewed on a very long time scale. Farinelli, et al. (2015) reported a weak effect of brain damage due to stroke (i.e., a diabetes complication) on attachment style status, and other long-term complications of diabetes include dementia and/or Alzheimer's Disease, which often elicit marked changes in affected individuals' personalities. As to the other requirement for a variable to meet the definition of a potential confounder (i.e., it lies outside the causal pathway), attachment style status most likely affects the outcomes of other medical illnesses on a comorbidity index (refer to the discussion in subpart 2.IV.B. of this thesis) for similar reasons that it purportedly affects diabetes health outcomes. In light of this exposition, it appears that adjusting on the results of a comorbidity index more likely distorts the estimates of effect resulting from associated regression analyses, than effectively controls for confounding, considering the relative strength of the evidence and congruent attachment theory that supports an understanding wherein attachment style determines physical illness severity/physical health status, and the relative weakness of the evidence and affiliated theoretical apprehensions that countenance a view whereby physical illness prescribes attachment style status.

At least one published study of attachment style and diabetes outcomes used a comorbidity index (herein referred to as "the Wells, et al. comorbidity index", owing to its apparent lack of a formal name as designated by its authors) based on the methods of Wells, et al. (2000) to adjust for participants' comorbidity statuses (Ciechanowski, et al., 2002; Wells, Sherbourne, Schoenbaum, Duan, Meredith, Unutzer, Miranda, Carney, & Rubenstein, 2000). The index—

included in the patient questionnaire that investigators of the primary study used for ascertaining outcomes which comprise the data set that the investigator of this secondary study employed in her analyses—grouped participants into categories, based on whether they reported 0, 1, 2, or more than 2 diseases from a list of 19 unweighted chronic conditions that apparently included the index disease (diabetes). Out of the remaining 18 conditions, all represented purportedly long-term diabetes complications: 1) stroke or major paralysis (ADA, 2013a; Qin, et al., 2013, Forbes & Cooper, 2013; Young, et al., 2008); 2) heart failure or congestive heart failure, (ADA, 2013a, Qin, et al., 2013; Forbes & Cooper, 2013; Young, et al., 2008); 3) angina or coronary artery disease (ADA, 2013a; Qin, et al., 2013; Forbes & Cooper, 2013; Young, et al., 2008); 4) any other heart disease (ADA, 2013a; Bartels, Saucier, Thorpe, Kind, Pandihi, Hansen, & Smith, 2012; Young, et al., 2008); 5) kidney failure (ADA, 2013a; Cignarelli, et al., 2008; Donath, 2014; Young, et al., 2008; Forbes & Cooper, 2013); 6) trouble seeing (even with glasses or contact lenses) (ADA, 2013a; Boulton, et al., 2005; Donath, 2014; Forbes & Cooper, 2013); 7) a physical disability such as a loss of an arm or leg, or loss of eyesight or hearing (ADA, 2013a; Forbes & Cooper, 2013; ADA, 2016; Young, et al., 2008); 8) a neurological condition (ADA, 2013a; Boulton, et al., 2005; Donath, 2014; ADA, 2016; Young, et al., 2008); 9) thyroid disease (Boulton, et al., 2005); 10) back pain, (Boulton, et al., 2005; Burner & Rosenthal, 2009); 11) arthritis or rheumatism (Bartels, et al. 2012; Schett, et al., 2013; Young, et al., 2008); 12) stomach ulcer (Peng, Leu, Luo, Huang, Hou, Lin, & Lee, 2013); 13) cancer (not including skin cancer) (Ding & Hu, 2007; ADA, 2016) diagnosed within the past 3 years; 14) hypertension or high blood pressure (Forbes & Cooper, 2013; Carretero & Oparil, 2000; Graves, 2000; Young, et al., 2008); 15) migraine headaches (Casucci, Villani, Cologno, & D’Onofrio, 2012; Aamodt, Stovner, Midthjell, Hagen, & Zwart, 2007; Split & Szydlowska, 1997; Guldiken, Guldiken,

Demir, Turgut, Kabayel, Ozkan, Ozcelik, & Tugrul, 2008; Burn, Machin, & Waters, 1984; Fava, et al., 2014); 16) chronic inflamed bowel, enteritis, or colitis (Gui, Subramony, Fratkin, & Hughson, 2002; Maconi, Furfaro, Sciurti, Bezzio, Ardizzone, & de Franchis, 2014; Harper, Welch, Sinanan, Wahbeh, & Lee, 2012); 17) asthma (Ehrlich, Quesenberry, Van Den Eeden, Shan, & Ferrara, 2010); and 18) trouble breathing, for example, caused by emphysema or chronic lung disease (Ehrlich, et al., 2010). The researchers interrogated associations between contemporary attachment style statuses (as exposures) and intermediate diabetes health outcomes (e.g., HbA1c), while adjusting for the presence/absence of *downstream* diabetes outcomes (i.e., long-term complications) (e.g., Ciechanowski, et al., 2002). Therefore, this case falls into the category of analyses that Ording and Sorensen (2013) deemed as likely to result in distorted estimates of association, by way of its introduction of a potential source of non-ignorable, non-differential misclassification bias (Ording & Sorensen, 2013; Lash, et al., 2007). This makes intuitive sense, given the progressive nature of diabetes, and the fact that long-term outcomes tend to consociate with worse intermediate diabetes health outcomes.

In addition to the Wells, et al. (2000) comorbidity index, researchers in Ciechanowski, et al. (2002) adjusted on a second, very similar measure (described in Jacobson, de Groot, & Samson, 1997) that explicitly ascertained diabetes complications. It assigned to each participant a score of 0 to 3—a simple, unweighted count of their complications (Jacobson, et al., 2000; Ciechanowski, et al., 2002). The same measure appears as a covariate in Ciechanowski, Katon, and Russo (2005), a study about diabetes and attachment style, where researchers described it as highly correlated with ratings of severity of diabetes from independent physicians (Jacobson, et al., 1997). Occurrences of one or more complications among type 2 diabetics indicate progression towards more advanced stages of the disease, associated with more difficulty in

controlling related health outcomes (e.g., HbA1c, SBP, DBP, LDL). In another study of attachment style and diabetes that applied a different comorbidity index, called the “Rx Risk” measure (Fishman, Goodman, Hornbrook, Meenan, Bachman, & O’Keefe Rosetti, 2003), researchers additionally adjusted on multiple measures with a similar effects (Ciechanowski, et al., 2004). They selected covariates based on chi-square tests and ANOVA outcomes, and included among them the number of diabetes complications (from seven categories) that each participant reported, obesity ($\text{BMI} \geq 30 \text{ kg/m}^2$) status, and diabetes treatment intensity (Ciechanowski, et al., 2004). Obesity is a risk factor for several intermediate diabetes health outcomes and long-term complications (ADA, 2012b; Forbes & Cooper, 2013), and, in adulthood, seems unlikely to affect attachment style. Like the number of diabetes complications, diabetes treatment severity (e.g., no medication vs. oral hypoglycemic agent only vs. insulin) accords with diabetes severity, often serving as a proxy indicator for the severity of the disease in associated research (Maddigan, et al., 2003), and so it generally relates to worse scores on measures of intermediate diabetes health outcomes. Insulin serves as the main and essential treatment for type 1 diabetics (Ciechanowski, et al., 2003), but also as a second (or last) line of defense in type 2 diabetics. Insulin use potentially co-varies with medication adherence outcomes for multiple reasons: 1) type 2 diabetics with advanced diabetes likely manifest lower levels of adherence to their medications, and 2) the negative side-effects of insulin possibly promote lower levels of medication adherence (compared to adherence among diabetics whose regimens exclude any insulin). Rajagopalan, et al. (2003) found lower adherence rates among diabetic patients treated with insulin, as compared to those only taking oral hypoglycemic agents (Rajagopalan, Joyce, Smith, Ollendorf, & Murra, 2003), and investigators in other studies of type 2 diabetics not previously treated with insulin reported that approximately 33% of their

participants indicated an unwillingness to take insulin, if prescribed (Polonsky, Fisher, Dowe, & Edelman, 2003; Larkin, Capasso, Chen, Mahoney, Hazard, Cagliero, et al., 2008). These results further highlight the difficulties inherent in combining type 1 and type 2 diabetics within a single study (Ciechanowski, et al., 2003).

In an independent study (Brenk-Franz, et al., 2015), researchers adjusted on a measure of comorbidity status constructed from six comorbidity indices, at least one of which comprises a simple, unweighted count of chronic conditions (i.e., the “[n]umber of chronic diseases diagnosed by the GP”, as identified from ICD-10 codes obtained in the course of chart review), with others consisting of weighted comorbidity indices (e.g., the “Cumulative Illness Rating Scale for Geriatrics (CIRS-G); a self-developed comorbidity index based on the total number of chronic conditions weighted by disease severity, as rated by a general practitioner on the basis of their interview with the affected participant; the Charlson Index), along with a comorbidity index whose weighting scheme (if one is applicable) remains unidentified (the “Von Korff Index”), and another self-developed comorbidity index that appears unweighted, which combines three questionnaires (the Four Dimensional Symptom Questionnaire, the Geriatric Depression Scale, and the Clinical Dementia Rating) designed to assay mental health outcomes (e.g., depression, anxiety, somatization, distress, dementia) (Schäfer, et al., 2009). Therefore, the limitations associated with both types of indices (weighted and unweighted) apply to this study’s results. At least one of the included comorbidity indices (i.e., the one based on participants’ ICD-10 diagnoses) contained the index disease (i.e., diabetes mellitus), and numerous long-term diabetes complications (e.g., atherosclerosis, chronic ischemic heart disease or angina pectoris, chronic stroke, chronic thyroid disorders, hearing loss, heart failure, migraine, neuropathies, osteoporosis, renal failure, rheumatoid arthritis, visual disturbances) (Schäfer, et al., 2009).

Therefore, this study (i.e., Brenk-Franz, et al., 2015) represents another case in which the authors adjusted for a measure of downstream diabetes complications (Schäfer, et al., 2009) in regression analyses testing various relationships between intermediate diabetes health outcomes (i.e., diabetes self-management behaviors) and attachment style status (measured in terms of attachment style dimensions).

The Rx Risk measure, and its former iteration—the chronic disease score (CDS)—use a complicated algorithm to compute a score that represents medical comorbidity, based on prescription drug use from computerized pharmacy records (Fishman, et al., 2003; Katon, Russo, Lin, Heckbert, Karter, Williams, Ciechanowski, Ludman, & Von Korff, 2009; Sloan, Sales, Liu, Fishman, Nichol, Suzuki, & Sharp, 2003). Rx Risk correlated with physician’s ratings of physical disease severity in one study, and predicted subsequent hospitalization and mortality rates over a 1-year period (Fishman, et al., 2003; Clark, Von Korff, Saunders, Baluch, & Simon, 1995). However, the measure specifically relates to one institution’s particular formulary (i.e., Group Health Cooperative), and therapeutic uses of medications change over time (Sloan, et al., 2003). Moreover, researchers developed the measure for one type of aim (e.g., predicting health services utilization and/or healthcare costs), while attachment theory researchers applied it to another (e.g., predicting health as a function of attachment style) (e.g., Fishman, et al., 2003; Ciechanowski, et al., 2004) The Rx Risk measure contains several classes of diseases, including diabetes itself, and many diabetes complications (e.g., coronary/peripheral vascular disease, heart disease/hypertension, renal disease, thyroid disorder, rheumatoid arthritis, gout), as well as a number of commonly co-occurring conditions (e.g., asthma, hypertension, pain and inflammation) (Fishman, et al., 2003). Several studies on relationships between diabetes and attachment styles adjust on the Rx Risk/CDS measure (e.g., Ciechanowski, et al., 2006(a);

Ciechanowski, et al., 2006(b); Ciechanowski, et al., 2004; Ciechanowski, et al., 2001; Ciechanowski, et al., 2005; Ciechanowski, et al., 2010). Among these studies, all adjusted for additional measures of diabetes severity (e.g., a diabetes complications index, BMI/obesity, treatment intensity) in examining relationships between attachment style and intermediate indicators of diabetes health (Ciechanowski, et al., 2010; Ciechanowski, et al., 2005; Ciechanowski, et al., 2004; Ciechanowski, et al., 2001; Ciechanowski, et al., 2006(a); Ciechanowski, 2006(b)). In some cases, researchers appropriately excluded the index disease (diabetes) from the comorbidity index (e.g., Ciechanowski, et al., 2010; Ciechanowski, 2001; Ciechanowski, et al., 2006(b)), but not the diabetes complications. Collectively, these studies account for a substantial proportion of the existing research on attachment style and diabetes, and many studies about attachment style and health (non-specific to diabetes) apply the same or similar methods (e.g., Ciechanowski, et al., 2002(a); Fenton, Von Korff, Lin, Ciechanowski, & Young, 2006; Maunder, Lancee, Hunter, Greenberg, & Steinhart, 2005; Holwerda, et al., 2013).

Based on the limitations reviewed in the paragraphs above, the author of this thesis contends that further research is required to substantiate the links between a dismissing attachment style (or any other attachment style) and worse diabetes health outcomes. Nonetheless, the findings from existing research serve as a starting point for the study conducted herein. The forthcoming subparts of this thesis summarize some evidence in support of its specific hypotheses, with regards to the nature of relationships between attachment style or diabetes health and three potential mediators in the pathway that purportedly exists (and that this thesis' study evaluates) between attachment style dismissingness and HbA1c level: maladaptive coping behaviors (particularly cigarette smoking), the frequency of visits to a primary care provider (as an indicator of both maladaptive coping behaviors and the patient-provider relationship), and the

patient-provider relationship (as delimited by an indicator of patients' trust in their primary healthcare providers).

V. Potential mediators between attachment style dismissingness and HbA1c

A. Maladaptive coping behaviors: Evidence from studies of attachment style and/or diabetes health

The ways in which individuals with illnesses, or at-risk of illnesses, cope with stressors in their lives can importantly influence their physical and psychological health outcomes (Glanz & Schwartz, 2008; Turan, Osar, Molzan Turan, Damci, & Ilkova, 2002; Lazarus & Folkman, 1984). Chronic stressors and individuals' responses to them affect the sympathetic nervous system and endocrine functions, which thereby influence the occurrences and progressions of several health problems, including cancer, infectious diseases, and HIV/AIDS (Glanz & Schwartz, 2008; Glaser & Kiecolt-Glaser, 2005). Research indicates that coping style plays a key role in glycemic control and overall health in patients with diabetes (Collins, Bradley, O'Sullivan, & Perry, 2009; Lundman & Norberg, 1993; Duangdao & Roesch, 2008; Kent, et al., 2010; Huang, et al., 2015). Ahmed, et al. (2006) observed a gradient of increasing risk for poor adherence to diabetes self-care behaviors with increasing alcohol consumption, and another study found an inverse relationship between alcohol use and the frequency of outpatient visits among individuals with some form of health insurance (Armstrong, Midanik, & Klatsky, 1998; Ahmed, Karter, & Liu, 2006), while the frequency of outpatient visits in patients with diabetes cogently affects HbA1c levels and other indicators of diabetes health status (refer to the evidence cited in subsection 2.IV.D. of this thesis). Therefore, coping plausibly affects diabetes outcomes directly (e.g., the adverse health effects of stress, given inadequate coping), and/or indirectly, as

through the modification of patients' treatment adherence (Turan, et al., 2002; Kent, et al., 2010; Maunder & Hunter, 2001; Sadava, et al., 2009).

Coping refers to an individual's cognitive and/or behavioral efforts to manage and tolerate stressful situations (Duangdao & Roesch, 2008; Lazarus & Folkman, 1984; Averro, Corace, Endler, & Calvo, 2003; Turan, et al., 2002), where stress most often represents a transactional phenomenon dependent on the meaning of the stimulus to its perceivers (Glanz & Schwartz, 2008; Duangdao & Roesch, 2008). Complimentarily, the evaluative process undertaken by an individual's working model in determining how to deal with a threat includes a preliminary, and subjective, valuation of what constitutes a threat (Maunder & Hunter, 2001). Adaptive coping strategies promote successful regulation, while maladaptive coping strategies consist of those that dissuade such an outcome (Carmody, 1989; Dawson, et al., 2014). In the context of health, no particular pattern of coping strategies appears to consistently result in positive health outcomes, but certain coping behaviors arguably denote "adaptive" strategies, insofar as they enable individuals to develop realistic appraisals of their illnesses, minimize their risky health behaviors, and engage in activities of health promotion (Glanz & Schwartz, 2008; Karlsen & Bru, 2002). By contrast, several strategies that some individuals invoke, as means of regulating dysphoric affect, particularize disease and/or diabetes risk factors (Maunder & Hunter, 2001); they thereby denote coping behaviors of an ostensibly maladaptive disposition. For the purposes of this thesis, "maladaptive coping behaviors" refer to those behaviors that individuals engage in as a means of reducing their stress, which fail to mitigate the source(s) of their stress, and that result in decreased probabilities of their achieving optimal diabetes health outcomes (defined, objectively, by health status indicators).

From an attachment theory perspective, Bowlby induced that attachment styles' working models organize action tendencies for coping with threats and danger (Bowlby, 1973; Ein-Dor, Mikulincer, & Shaver, 2011; Sadava, et al., 2009). A substantial body of research supports the claim that coping with stress implicates adult attachment orientations (Ein-Dor, Mikulincer, & Shaver, 2011; Mikulincer & Shaver, 2007; Kobak & Sceery, 1988; Mikulincer, Florian, & Tolmacz, 1990; Maunder & Hunter, 2001; Solomon, Ginzburg, Mikulincer, Neria, & Ohry, 1998; Dewitte, De Houwer, Goubert, & Buysse, 2010; Maunder & Hunter, 2001; Sadava, et al., 2009; Maunder & Hunter, 2008; Brenk-Franz, et al., 2015). For example, avoidantly attached individuals appear reluctant to seek help or comfort during stressful events, and they tend to rely on cognitive or behavioral distancing strategies such as diverting attention from threat-related cues and suppressing threat-related thoughts (Ein-Dor, et al., 2011; Birnbaum, Orr, Mikulincer, & Florian, 1997; Fraley & Shaver, 1997; Mikulincer & Florian, 1998; Turan, Osar, Turan, Ilkova, & Damci, 2003; Mikulincer & Shaver, 2007). At the same time, people with anxious attachment styles demonstrate vigilance with respect to potential threats and dangers, and they react by seeking closer contact with others and expressing their intense needs and worries (Ein-Dor, et al., 2011; Feeney & Noller, 1990; Mikulincer, Orbach, & Iavnieli, 1998). Mikulincer and Florian found that patients with chronic back pain who had predominantly ambivalent (i.e., preoccupied) and avoidant (i.e., dismissing and fearful) attachment styles appraised their conditions in more threatening terms, and themselves as less capable of dealing with their pain, compared to the securely attached study participants. They also found that members of the two former categories employed less problem-focused strategies/more emotion-focused strategies for coping with pain than their securely attached counterparts (Mikulincer & Florian, 1998).

Schmidt, et al. argued that attachment theory delineates a suitable umbrella theory for the study of coping within a medical context, for multiple reasons, including that Bowlby conceptualized the attachment system as activated by stress and disease (Bowlby, 1988; Schmidt, Nachtigall, Wuethrich-Martone, & Strauss, 2002). In their study, the authors found a significant association between coping strategies and attachment styles among patients with one of three types of diseases: breast cancer, chronic leg ulcers, and alopecia (Schmidt, et al., 2002). They also reported that secure study participants demonstrated a strong tendency to seek out social support, while ambivalently attached (i.e., preoccupied) individuals engaged in more negative emotional coping, and avoidantly (and securely) attached study participants presented with higher levels of diverting behaviors (Schmidt, et al., 2002). Likewise, Brenk-Franz, et al. (2015) purported that attachment theory constitutes a fitting explanatory model for individual differences in disease-related behavior and coping, and Maunder and Hunter (2001) developed a model of relationships between attachment styles statuses and disease outcomes or health behaviors that describes how insecure attachment correlates with disturbances of stress regulation (i.e., an inability to cope effectively), uses of external regulators of affect (e.g., alcohol, tobacco, illicit drugs), and nonuses of protective (i.e., adaptive) behaviors. Viederman & Hymowitz (1988) proposed that the mobilization of maladaptive defenses during a health crisis coincides with an inability, or decreased ability, to deploy adaptive coping behaviors (e.g., monitoring blood-glucose levels, adjusting insulin doses or dietary intake), and studies suggest that insecure attachment styles dispose individuals to less adaptive forms of affect regulation and problem coping which, in turn, increase the levels of transient distress that the affected individuals experience (i.e., maladaptive coping behaviors) (Lopez, Mauricio, Gormley, Simko, & Berger, 2001; Dawson, Allen, Marston, Hafen, & Schad, 2014).

Elsewhere, secure attachment styles corresponded to a number of beneficial regulatory behaviors that some theorists denoted as “constructive ways of coping” (Mikulincer & Shaver, 2007; Epstein & Meier, 1989). These included efforts to engage in problem solving and cognitive reappraisal, place negative events in perspective, and mobilize support from people who possess additional resources or perspectives that facilitate solving the problem or reducing its stressful effects (Mikulincer & Shaver, 2007; Kobak & Sceery, 1988; Solomon, et al., 1998). Secure people enjoy a degree of self-confidence that allows them to integrate new information, and adjust their plans flexibly to accommodate changing circumstances as they arise (Mikulincer & Shaver, 2007). The members of this category construe events in relatively benign terms, symbolically transform threats into challenges, maintain optimistic senses of self-efficacy, and often attribute undesirable events to controllable, temporary, or context-dependent causes (Mikulincer & Shaver, 2007; Solomon, et al., 1998). The ability to cope effectively, conversely, facilitates attachment style security, and yields opportunities for effective problem-solving, as explained by Cassidy: “[t]he experience of [attachment] security is based not on the denial of negative affect but on the ability to tolerate negative affects temporarily in order to achieve mastery over threatening or frustrating situations” (Cassidy, 1994; Mikulincer & Shaver, 2007). Secure individuals likely attend to more painful information before resorting to emotion-focused coping strategies, such as defensive exclusion (refer to subpart 2.V.C.iii.b.(iii) of this thesis), which enables them to engage with problems more consistently (Dykas & Cassidy, 2011).

The hyperactivating and deactivating strategies characteristic of insecure attachment styles lead to opposite patterns of emotional expression, but both appear dysfunctional as to their enablements of individuals to sustain their interpersonal relationships and achieve good diabetes health (Mikulincer & Shaver, 2007; Ciechanowski, et al., 2004). These ineffective approaches to

managing negative emotions (Ein-Dor, Mikulincer, & Shaver, 2011a) put insecure individuals at higher risks of using substances as a way to alleviate their emotional discomfort (Caspers, Cadoret, Langbehn, Yucuis, & Troutman, 2005). Avoidantly attached individuals administer what Lazarus and Folkman called “distancing coping” (Lazarus & Folkman, 1984; Mikulincer & Shaver, 2007; Mikulincer, Florian, & Weller, 1993). Such regulatory attempts incorporate denial or suppression of emotion-related thoughts and memories, diversion of attention away from emotion-related material, suppression of emotion-related action tendencies, and inhibition or masking of verbal and non-verbal expressions of emotion (Mikulincer & Shaver, 2007; Dykas & Cassidy, 2011). They aim at preventing the conscious experience of painful beliefs about rejection and/or abandonment, and they enable individuals to dissociate themselves from the effects of their emotions on experience and behavior (Mikulincer & Shaver, 2007; Mikulincer, Florian, & Weller, 1993; Kobak & Sceery, 1988; Mikulincer, et al., 1990; Dykas & Cassidy, 2011). The latter eventuality permits dismissing types to refrain from reactions implying neediness or dependence, which run counter to their desire to maintain self-reliance (Mikulincer & Shaver, 2007; Maunder & Hunter, 2012a). On the other hand, anxious hyperactivation intensifies and sustains those emotions which activate the attachment system (e.g., fear, worries about abandonment, doubts about self-efficacy) (Mikulincer & Shaver, 2007; Dawson, et al., 2014). Unlike avoidant and secure types, who consider negative emotions as goal-incongruent, anxious individuals perceive some negative emotions as congruent with their attachment style goals of persuading attachment figures to pay more attention to them and to provide them with reliable protection and/or care (Cassidy, 1994; Mikulincer & Shaver, 2007). Anxious hyperactivation entails tactics such as catastrophic appraisal, amplifying the threatening aspects of a problem (even minor ones), maintaining pessimistic beliefs about one’s inability to manage

distress, and attributing threats to uncontrollable causes and personal inadequacies (Mikulincer & Shaver, 2007; Dawson, et al., 2014). Within Lazarus and Folkman's parlance, such a style typifies "emotion-focused coping" (Lazarus & Folkman, 1984; Mikulincer & Shaver, 2007). Research suggests that emotion-focused coping consociates with poor adjustment and adherence to health regimens in chronically ill patients, and with elevated levels of anxiety, depression, and blood-glucose in diabetics (Duangdao & Roesch, 2008). Maintaining low self-efficacy (i.e. pessimistic beliefs about one's ability to manage stress) also predicts poor health/diabetes outcomes (Venkataramen, et al., 2012; Sarkar, Fisher, & Schillinger, 2006; Mishali, Omer, & Heymann, 2011; Johnston-Brooks, Lewis, & Garg, 2002). It appears that, rather than seizing on the adaptive possibilities of their emotional experiences, anxious individuals focus their attention on the disruptive aspects, and maintain beliefs inimical to achieving optimal diabetes health (e.g., low self-efficacy) (Mikulincer & Shaver, 2007).

Another common taxonomy of coping that dovetails with attachment theory labels coping attention directed towards a threat as "approach coping", and activities that deflect attention away from threats as "avoidance coping" (Duangdao & Roesch, 2008; Holahan & Moos, 1987; Levin, Ilgen, & Moos, 2007). Related research suggests that individuals with chronic illness who used more approach coping strategies better adjusted to their diseases (Karlsen & Bru, 2002; Duangdao & Roesch, 2008), as compared to those who used more avoidance coping strategies (Duangdao & Roesch, 2008). These findings comply with the previously articulated results of Ciechanowski, et al.'s studies (refer to section 2.IV.C. of this thesis), which showed that a dismissing attachment style consistently predicted poorer diabetes health outcomes than secure and/or preoccupied attachment styles. Concordantly, some researchers theorize that high self-efficacy (a positive view of the self) in the absence of effective coping (e.g., an

unwillingness to rely on others in times of need)—in short, the dismissing attachment style—represents a particularly problematic constitution (i.e., dismissing attachment style), whereby such individuals seem likely to manifest especially poor treatment outcomes (Levin, Ilgen, & Moos, 2007).

Without the capacity to rely on social support insecurely attached individuals ostensibly resort to other strategies for coping with their emotional distress (Brenk-Franz, et al., 2015) —some of them maladaptive in the context of health or diabetes health—that include alcohol, tobacco, and illicit drug use, and over-eating (Mauder & Hunter, 2001; Wilkinson, Rowe, Bishop, & Brunstrom, 2010; Thorberg & Lyvers, 2006; Kassel, Wardle, & Roberts, 2007; Williams & Bailey, 2010; Mikulincer & Shaver, 2007; Taube-Schiff, et al., 2015; Young & Cooper, 2013; Ahrens, et al., 2012; Ciechanowski, et al., 2004; Sadava, et al., 2009). Extensive research indicates a strong association between childhood trauma and smoking/nicotine dependence (Blalock, et al., 2011). Mauder and Hunter proposed the altered use of such “external regulators of affect” as one pathway by which insecure attachment could, theoretically, affect disease outcomes (Mauder & Hunter, 2001). The authors adduced several types of external regulating behaviors that conceivably bear out on health, including smoking tobacco, drinking alcohol, using psychoactive drugs, over-eating, undereating, and engaging in risky sexual activity (Mauder & Hunter, 2001). They predicted associations between attachment style insecurity and greater usages of external regulators (Mauder & Hunter, 2001); other researcher adopted similar hypotheses (e.g., Dawson, et al., 2014; Wilkinson, Rowe, Bishop, & Brunstrom, 2010). Accordantly, two studies (Raynes, Auerbach, & Boytyanski, 1989; Wilkinson, et al., 2010) produced evidence that external regulation through food intake serves as a mechanism responsible for obesity. For all that, the study undertaken in the current thesis considers only

cigarette smoking, for several reasons: the data available for its analyses lack any information specifically regarding over-eating, very few participants responded to questions on the subject of illicit drug use, and extant research on diabetes precludes any official recommendations stipulating alcohol or illicit drug use guidelines (i.e., some studies suggest that moderate alcohol consumption promotes improved cardiovascular health) (Ahmed, Karter, & Liu, 2006; ADA, 2012a; ADA, 2013a). Consequently, the following sub-parts of this thesis primarily review evidence from studies about cigarette smoking, diabetes, and/or attachment theory.

Both anxious and avoidant patterns of attachment correspond to higher risks of substance abuse, compared to those associated with the secure style (Mikulincer & Shaver, 2007; Schindler, Thomasius, Sack, Geinmenhardt, Kustner, & Eckert, 2005; Caspers, et al., 2005; Caspers, Yucuis, Troutman, & Spinks, 2006; McWilliams & Bailey, 2010; Dawson, et al., 2014). In adolescent samples, numerous studies documented increased levels of cigarette smoking, alcohol consumption, and drug abuse among insecure individuals (Mikulincer & Shaver, 2007; DeFronzo & Pawlak, 1993; Maunder & Hunter, 2001; Brook, Whiteman, Finch, & Cohen, 1998). Similar findings emerged from studies of young adult and adult samples (Mikulincer & Shaver, 2007; Mickelson, et al., 1997; Brook, Whiteman, Finch, & Cohen, 1998; Kassel, et al., 2007; Thorberg & Lyvers, 2006; Vungkhanching, Sher, Jackson, & Parra, 2003); taken together, they defy simple conclusions regarding the relative importance of individual insecure attachment style sub-types in determining substance abuse behaviors (Mikulincer & Shaver, 2007). However, several studies suggest linkages between dismissing attachment and substance use, including smoking, in the context of coping. In one study (Bricker, Schiff, & Comstock, 2011) researchers described a style of coping referred to as “avoidant coping,” which some define as the tendency to divert attention away from aversive emotions, thoughts, and physical sensations

elicited by challenging situations. Consistent with this thesis' conceptualization of maladaptive coping behaviors, the authors of the study indicated that an avoidant coping style may paradoxically increase the very emotions, thoughts, and sensations that an individual tries to avoid (Bricker, et al., 2011). Furthermore, researchers in the study found that participants who scored high on a measure of avoidant coping were 2.52 times more likely to start smoking by the age of 20 (Bricker, et al., 2011). In another study, researchers found that adults with avoidant attachment styles drink alcohol to enhance their experiences of positive affect (Magai, 1999; Maunder & Hunter, 2001). The avoidant dimension corresponded to an increased odds of smoking in one study of primary care patients (Ahrens, Ciechanowski, & Katon, 2012), and in a second study by Ciechanowski, et al., researchers reported a relationship between the dismissing attachment style and higher rates of smoking among diabetic patients (Ciechanowski, et al., 2004). These findings support this thesis' hypothesis of a link between attachment style dismissingness and increased levels of cigarette smoking.

i. Cigarette smoking as a maladaptive coping behavior

Manifold influences motivate individuals to engage in tobacco smoking (Lujic, Reuter & Netter, 2005; Jamner, Whalen, Loughlin, Mermelstein, Audrain-McGovern, Krishnan-Sarin, Worden & Leslie, 2003); the relative importance of each changes with developmental stages of smoking progression (Carmody, 1989) and/or age (Jamner, et al., 2003). Merely one article on the subject enumerates seven types of smoking motivations, related to seven different theories, which the authors referred to as the psychosocial, sensorimotor, sedation, indulgence, dependence, genetic, and automatic theories of smoking (Lujic, Reuter, & Netter, 2005). Within their rubric, individual motivations for smoking include desires for increased attention, concentration, social competence, social conformity, and positive affect or reduced levels of

stress, anxiety, depression, boredom, and fatigue; the seeking out of pleasure; poor impulse control; high nicotine tolerance; low self-efficacy for quitting; the presence nicotine cravings; genetic risk factors; the avoidance of withdrawal symptoms; and an affinity for non-pharmacological smoking sensations (e.g., the taste, smell, or manual manipulation of cigarettes) (Lujic, et al., 2005). Additional motivations that fall outside the prescribed theoretical categories include desires for weight loss (Rodgers, Sales, & Chabrol, 2010) or distraction, and denial (McGee, Williams, Nada-Raja, & Olsson, 2013). Moreover, myriad environmental factors act synergistically with such motivations to influence smoking behaviors (Blalock, et al., 2011; Johnson & Kaplan, 1990; Lujic, et al., 2005; Carmody, 1989; McGee, Williams, Poulton, & Moffitt, 2000). Therefore, a vast body of research interrogates the underpinnings of smoking behaviors.

One frequently explored category of smoking motivations encompasses the desire for affect regulation (Carmody, 1989; Carmody, Vieten, & Astin, 2007; Schleicher, Harris, Catley, & Nazir, 2009; Blalock, et al., 2011; Shiffman Balbanis, Gwaltney, Paty, Gyns, Kassel, Hickox, & Paton, 2007; Jamner, et al., 2003; McChargue, Cohen, & Cook, 2004; Ludman, et al., 2002; Bricker, et al., 2011; McGee, et al., 2013; McMahan & Jason, 1998), with associated behaviors that translate directly into coping strategies. Stress and anxiety represent key determinants of smoking initiation and maintenance, and therefore comprise the focus of extensive research on smoking (Carmody, 1989; Carmody, 2007; Brandon, 1994). McKennel and Thomas, in their classical study of smoking motivations, showed that participants endorsed stress or stress relief as the strongest reason for smoking (McKennel & Thomas, 1967), and subsequent research consistently supported this result (Carmody, 1989; Ludman, et al., 2002). The evidence led researchers to propose that cigarette smoking functions as a pharmacologic coping tool for the

management of stress, anxiety, and other forms of negative affect (Carmody, 1989; Khantzian, 1997; Baker, Piper, McCarthy, Majeski, & Fiore, 2004; Orlando, Elickson, & Jinnett, 2001). In studies of adolescents, vulnerabilities to stress and stressful life events predicted smoking initiation, transitions from experimental to regular smoking, and increased frequencies and durations of smoking over a period of several years (Orlando, et al, 2001). Elsewhere, studies showed that anxiety within social situations (Carmody, 1989; Buckner & Vinci, 2013; Watson, VanderVeen, Cohen, DeMarree & Morrell, 2012), and social anxiety disorder (e.g., Cogle, Zvolensky, Fitch & Sachs-Ericsson, 2010; Piper, Cook, Schlam, Jorenby & Baker, 2011), contributed to negative smoking behaviors among adolescent and adult study participants. Zvolensky, et al. (2004) found that individuals with elevated anxiety sensitivity exhibited greater expectancies for negative affect reduction as a result of smoking, increased motivations for smoking to reduce negative affect, and low levels of confidence about their abilities to remain abstinent in the face of emotional distress (Zvolensky, Feldner, Leen-Feldner, Bonn-Miller, McLeish & Gregor, 2004; Zvolensky, Bonn-Miller, Feldner, Leen-Feldner, McLeish & Gregor, 2006). Along with stress and anxiety, research indicates that relief from depression constitutes another common motivation for smoking (Schleicher, et al., 2009; Carmody, 1992). Taken altogether, this evidence goes towards establishing cigarette smoking as a type of coping behavior.

The “adaptiveness” of a given coping strategy depends on the stressor’s mutability; problem-focused coping strategies appear most adaptive for conditions with mutable stressors, while emotion-focused coping strategies allow individuals to adapt most effectively to immutable threats (McMahon & Jason, 1998; Glanz & Schwarz, 2008; Lazarus & Folkman, 1984). Type 2 diabetes and its complications, to a large extent, constitute mutable threats (refer

to the discussion on genetic risk factors for type 2 diabetes in subsection 2.I.C. of this thesis). Therefore, problem-focused strategies (those which attempt to resolve the problem that causes distress) appear most effective for coping with diabetes, but smoking represents an emotion-focused coping strategy, in that it primarily aims to change the way that affected individuals think or feel about their stressful situations (McMahon & Jason, 1998; Glanz & Schwartz, 2008; Lazarus & Folkman, 1984), as opposed to solving the problem. Moreover, smoking exacerbates the symptoms of type 2 diabetes, and some of its related complications. Thus, smoking meets the current thesis' definition of a maladaptive coping behavior.

a. The effects of smoking on type 2 diabetes risk

Several epidemiologic studies conducted in a wide variety of populations evince that smoking increases the risk of developing type 2 diabetes—frequently in accordance with a dose-response relationship (e.g., Wannamethee, et al., 2001; Stein, et al., 2014; Rimm, et al., 1995; Eliasson, 2003; Willi, Bodenmann, Ghali, Faris, & Cornuz, 2007). Only a few underpowered or inadequately designed studies failed to show an association between smoking and diabetes risk (Eliasson, 2003). The authors of a 2007 meta-analysis, of 25 prospective cohort studies on type 2 diabetes incidence as a function of participant's smoking statuses, reported that heavy smokers (i.e., ≥ 20 cigarettes/day) incurred a significantly higher relative risk (RR) of type 2 diabetes (RR, 1.61; 95% CI: 1.43-1.80) than lighter smokers (RR, 1.29; 95% CI: 1.13-1.48), as did actively smoking participants in comparison with formerly smoking participants (RR, 1.23; 95% CI: 1.13-1.48), consistent with a dose-response phenomenon, after adjusting on various measures of study quality criteria and participants' health and demographic characteristics (which included other risk factors for type 2 diabetes) (Willi, et al., 2007). They also concluded that a greater risk of type 2 diabetes characterized the study's active smokers, compared to its former smokers

(Willi, et al., 2007). In another study, Rimm, et al. estimated that a 1.94 (95% CI: 1.25-3.03) relative risk of type 2 diabetes applied to smokers, in their all-male sample, compared to the non-smokers (Rimm, et al., 1995). Consistent with these findings, investigators in a recent analysis of 2001 - 2010 data from the Behavioral Risk Factor Surveillance System (BRFSS) reported a higher proportion of former smokers among adult diabetics (36.3%) than among adults without a diabetes diagnosis (23.3%), and they found that these proportions remained stable over a period of the 10 years (Fan, et al., 2013). A study by Rafalson, et al. demonstrated that tobacco smoking significantly predicted individuals' transitions from normoglycaemia to impaired fasting glucose (IFG) (a common indicator of "pre-diabetes" status) over the course of 6 years, in a randomly selected cohort of non-diabetic (at baseline) study participants (Rafalson, Donahue, Dmochowski, Rejman, Dorn, Trevisan, 2009; Clair, Meigs & Rigotti, 2013). Moreover, Ding and Hu deduced, on the basis of findings from Willi, et al., 2007 and some national statistics on cigarette smoking among U.S. adults, that 12% of all type 2 diabetes cases in the United States were attributable to smoking (Ding & Hu, 2007). At the same time, myriad other researchers established that smoking increases mortality rates in the general population, and/or that smokers die, on average, 8-10 years earlier than non-smokers (Fagard & Nilsson, 2009; Fagard, 2009; DeStefano, et al., 1993). In short, despite the earlier deaths of smokers, the lifetime risk of developing type 2 diabetes in this population appears higher than that of non-smoking adults, which suggests a direct and causal relationship between tobacco smoking and diabetes incidence (Fagard & Nilsson, 2009).

b. The effects of smoking on the risks of diabetes symptoms, intermediate outcomes, long-term outcomes, and mortality

Less consistently, research shows that smoking contributes to diabetes' progression, and some types of diabetes complications (ADA, 2012a; Eliasson, 2003; Plotnikoff, Lippke, Prodaniuk, Wild, & Barrett, 2007; Clair, et al, 2013; Cignarelli, et al., 2008; Qin, et al, 2013; Stein, Asthana, Smith, Piper, Loh, Fiore & Baker, 2014; Fagard & Nilsson, 2009; Nagrebetsky, Brettell, Roberts & Farmer, 2014). In type 1 diabetics, a cross-sectional study showed that smokers required significantly higher doses of insulin to achieve similar HbA1c outcomes, compared to non-smokers (Madsbad, McNair, Christensen, Christiansen, Faber, Binder & Transbol, 1980). Similarly, after controlling for attitudes toward diabetes, psychological well-being, and other associated factors Lundman, et al. found that more frequent smoking occurred in individuals with higher HbA1c levels (Lundman, Asplund & Norberg, 1990), while Nilsson, et al. found that significant, independent associations existed between smoking and elevated levels of HbA1c or microalbuminuria, in type 1 and type 2 diabetics from the Swedish National Diabetes Register (Nilsson, Gudbjornsdottir, Eliasson, Cederholm & Steering Committee of the Swedish National Diabetes Register, 2004). Paivansalo, et al. reported significantly higher HbA1c levels among type 2 diabetics with microalbuminuria (Paivansalo, Merikanto, Savolainen, Lilja, Rantala, Kauma, Reunanen, Kesaniemi & Suramo, 1998). Researchers further demonstrated that impaired insulin sensitivity levels characterized smokers, as compared to non-smokers, among healthy adult study participants (Eliasson, 2003) and that tobacco consumption and serum cotinine (a metabolite of nicotine) levels correlated positively with insulin resistance outcomes. However, considerable differences distinguish the metabolic processes of type 1 from type 2 diabetics (Eliasson, 2003)—to say nothing of differences separating diabetics from non-diabetics

in tobacco smoking research. As much of the work documenting effects of tobacco smoking on health outcomes, to date, focuses on populations not restricted to diabetic individuals, the precise nature of tobacco smoking's effects on diabetes outcomes remains largely uncertain (ADA, 2014). Additionally, some studies failed to find significant differences between the insulin sensitivity outcomes of smokers and non-smokers (Eliasson, 2003).

Further evidence of smoking's effects on metabolic control accumulates from studies, wherein researchers demonstrated associations between participants' engagements in smoking behaviors and increases in their serum concentrations of free fatty acids, triglycerides, and atherogenic, small dense particles, in proportion to their other low-density lipoproteins (LDL), along with decreases in their high-density lipoproteins (HDL) particles (Eliasson, 2003; Guilherme, Virbasius, Puri & Czech, 2008; Yu & Ginsberg, 2005). Consistent evidence shows that smoking induces hypoxic stress, which aggravates structural and biochemical modifications in glomerular basement membranes (GBM) induced by hyperglycemia, affects glycosaminoglycan metabolism (Cignarelli, et al., 2008). However, not all studies found that smoking adversely increased participants' metabolic control. Researchers in some studies even reported worse metabolic outcomes after smoking cessation, such as decreases in participants' glucose metabolism outcomes, or increases in incident type 2 diabetes or IFG (Stein, et al., 2014; Iino, Iwase, Tsutsu & Iida, 2001; Wannamethee, et al., 2001). Reports of weight gain following smoking cessation additionally spurred expressions of concern by some researchers that increased adiposity levels countered any benefits that individuals accrued as a result of successful smoking cessation, in terms of their relative impacts on indicators of diabetes health (Stein, et al., 2014).

Findings of this kind contradict those of many other studies on smoking and diabetes health. Stein, et al., found that smoking cessation precipitated improvements in participants' lipids, lipoproteins, and endothelial functions, despite associated weight gain, and longitudinal analyses of the Framingham Heart Study and Women's Health Initiative data showed that weight gain after smoking cessation failed to attenuate resultant reductions in CVD risk (Stein, et al., 2014). Moreover, a number of alternative exigencies potentially exist to explain them, including certain, material differences between participants in contemporary versus historical study cohorts (e.g., differences in smoking behaviors, and average BMI) (Stein, et al., 2014; Wannamethee, et al., 2001), ascertainment bias (e.g., in studies where participants' smoking behaviors and/ or smoking-related events increased the likelihood that they received diabetes diagnoses), misclassification bias (e.g., in studies where investigators classified their participants, with respect to diabetes statuses, according to antiglycemic medication usage, as providers occasionally prescribe such medications for treating other conditions) (Safford, Russel, Suh, Roman & Pogach, 2005; Stein, et al., 2014) and reversals of cause and effect, which commonly operate in cross-sectional studies (Nishiyama, Kimijima, Muto & Kimura, 2012). More abstrusely, some researchers' tests of various interaction terms for diabetes and smoking status failed to reach significance, in associations between smoking status and diabetes-smoking complications (primarily CVD) (e.g., Al-Delaimy, Willett, Manson, Speizer & Hu, 2001). They suggest that no increases occur in the risks of diabetes complications as a result of smoking.

Both smoking and diabetes independently increase an individual's risk of cardiovascular disease (ADA, 2014; Al-Delaimy, Manson, Solomon, Kawachi, Stampfer, Willett & Hu, 2002; Fagard & Nilsson, 2009; Morrish, Stevens, Fuller, Jarrett, & Keen, 1991), renal disease (Cignarelli, et al., 2008; Nilsson, et al., 2004; Chase, Garg, Marshall, Berg, Harris, Jackson &

Hamman, 1991), stroke (Fagard & Nilsson, 2009), inflammatory bowel disease (CDC, 2014), and certain types of cancers (Ding & Hu, 2007; CDC, 2004). Yet, only some studies indicate that interactions between smoking and diabetes enhance the risk of each complication beyond that of either exposure alone (ADA, 2014). With respect to renal dysfunction, smoking consociates significantly with the development of persistent microalbuminuria and overt nephropathy among studies of type 1 diabetics, with some studies showing a dose-response relationship (Cignarelli, et al., 2008). In type 2 diabetic samples, researchers reported increased prevalences of microalbuminuria and macroalbuminuria among smokers, and established smoking as a highly significant, independent risk factor for microalbuminuria in a very large cross-sectional study (N = 24,151) (Cignarelli, et al., 2008; Eliasson, 2003). Evidence further suggests that smoking affects renal structures (Cignarelli, et al., 2008). For example, researchers found that smoking corresponded to thicker GBMs in type 2 diabetics and increased GBM width in a dose-dependent fashion, as well as increases in renal arteriolar thickness (Cignarelli, et al., 2008; Parving, et al., 1998). Conversely, studies showed that smoking cessation ameliorated progressive renal injury caused by continual smoking, and reduced cardiovascular mortality outcomes in patients with diabetic nephropathy (Cignarelli, et al., 2008).

Smoking appears to increase microvascular diabetes complications (e.g., nephropathy, retinopathy, and neuropathy) more strongly in type 1 than type 2 diabetics, while more pronounced risks of macro-vascular complications occur in type 2 individuals in relation to smoking (Fagard & Nilsson, 2009). The former finding, in part, reflects insufficient research on the causes of diabetic neuropathies (a sub-type of microvascular complications from diabetes) in type 2 diabetes, due to methodological difficulties and frequent confounding that arise as a result of protracted developmental courses of such conditions in type 2 diabetics (Eliasson, 2013).

Among type 2 diabetics, research also shows that smoking tends to promote atherosclerosis, coronary heart disease, stroke, and peripheral vascular disease (Eliasson, 2003).

Several studies indicate that tobacco smoking increases diabetics' risks of all-cause mortality significantly beyond the levels of diabetic non-smokers (e.g., Ford & DeStefano, 1991; Al-Delaimy, et al., 2001; Nelson, Boyko & Koepsell, 2010). In one study, investigators reported that smokers sustained a nearly 80% higher risk of mortality, from all causes, than non-smokers in a nationally representative sample of diabetic adults (Nelson, et al., 2010). Consistent with these findings, a recent meta-analysis of prospective cohort studies on associations between diabetes and smoking status reported a 36-54% excess risk of mortality, attributable to smoking, from a variety of vascular outcomes among diabetics (Qin, et al., 2013). Comparisons between diabetic smokers and diabetic non-smokers, in the same study, yielded significant estimates of relative risk (RR) for smokers on outcomes of total mortality, cardiovascular mortality, CHD, stroke, and MI that amounted to 1.48 (95% CI: 1.34-1.64), 1.36 (95% CI: 1.22-1.52), 1.54 (95% CI: 1.31-1.82), 1.44 (95% CI: 1.28-1.61), and 1.52 (95% CI: 1.25-1.83), respectively (Qin, et al., 2013). Certain aspects of the researchers' approach, in this study, oblige a great deal of caution in interpreting their results. Despite broad conclusions that smoking amplified mortality risks and cardiovascular events among diabetics, each hypothesis interrogated by the researchers related to a different sample of the prospective cohort studies, from the 46 (in total), that they included among the study's meta-analyses (Qin, et al., 2013). The RR estimates cited earlier in this paragraph, for example, derive from samples that ranged, in their sizes, from 7 to 27 individual studies on diabetes and smoking behaviors—each one, in turn, corresponding to different numbers and samples of individual diabetics (Qin, et al., 2013).

Research implicates tobacco smoking in a number of mechanisms that putatively drive the increases observed in participants' risks for diabetes, and diabetes symptoms, complications, or associated metabolic abnormalities in many studies on the subject. Notably, smoking increases levels of inflammation and oxidative stress, impairs endothelial functioning, and damages beta-cell functioning, directly—all factors shown to increase insulin resistance (Ding & Hu, 2007; Sato, et al., 2013). Additional mechanisms, summarized by Eliasson (2003) and Fagard & Nilsson (2009) and supported by citations from the current author's literature review, include associations between smoking and 1) impaired levels of insulin sensitivity, due to increased inflammatory markers secondary to smoking-induced bronchitis and pulmonary infection; 2) lipotoxicity, stemming from increased triglyceride levels; 3) hypercortisolaemia, and increased abdominal fat tissue, resulting from greater productions of adipokines, cytokines, and other chronic inflammation markers; 4) impaired sleeping patterns; 5) increased levels of psychosocial stress; 6) increased engagements in unhealthy lifestyle behaviors (e.g., poor diet, decreased physical activity levels, increased alcohol consumption); and 7) impaired fetal growth among expectant mothers (associated with an increased risk of diabetes in their adult offspring). Moreover, Cignarelli, et al. suggested that nicotine-induced increases in blood pressure and heart rate, via sympathetic activation, and vasopressin release appeared among the major mechanisms that contribute to smoking's adverse effects on renal functioning, and increased sympathetic activity *per se* accelerates the progression of renal failure, independently of effects from blood pressure (Cignarelli, et al., 2008). Therefore, increases in type 2 diabetes and/or diabetes complications associated with smoking likely occur through both direct and indirect pathways, with effects mediated by changes in insulin resistance, beta-cell dysfunction, chronic inflammation, psychosocial stress, blood pressure, renal functioning and structure, risky health

behaviors, and dyslipidemia (Eliasson, 2003; Fagard & Nilsson, 2009; Cignarelli, et al., 2008; Lamarche, 1998; Sato, et al., 2013).

c. The effects of smoking on relationships between BMI and blood pressure, CVD risk, diabetes risk, and diabetes progression

BMI primarily influences diabetes health through its effects on blood pressure, with higher levels of blood pressure corresponding to increased risks of cardiovascular disease (CVD), but research also suggests that smoking behaviors act on this relationship to modify it. Many studies report direct and continuous associations between participants' outcomes on measures of BMI and blood pressure, such that these qualities appeared to describe the essential nature of these two risk factors' relationships with one another (The Obesity in Asia Collaboration, 2008; Shihab, Meoni, Chu, Wang, Ford, Liang, Gallo & Klag, 2012; Tesfaye, Nawi, Van Minh, Byass, Berhane, Bonita & Wall, 2007; Huang, et al., 1998). For example, researchers in an analysis of data from the Framingham Heart Study found that every 10% increase in body weight, among male participants, corresponded to a 6.6 mm Hg increase in their systolic blood pressure outcomes across the entire range of the study's data (Ashley & Kannel, 1974). A strong, continuous, and positive correlation also appears to exist between blood pressure or hypertension status, and the risk of cardiovascular disease (CVD) (Kannel, et al., 1990; Carretero & Oparil, 2000). Yet, several studies indicate that BMI departs significantly from CVD risk (e.g., The Obesity in Asia Collaboration, 2008), particularly in instances where participants belong certain ethnic populations (e.g., Tesfaye, Nawi, Van Minh, Byass, Berhane, Bonita & Wall, 2007), or in the presence of tobacco smoking (e.g., Yun, Kimm, Choi, Jee, & Huh, 2012). Studies of the latter type implicate the existence of complex relationships between BMI and CVD risks, not fully explained by BMI's linear association to blood pressure and exacerbated by smoking.

Smokers frequently present with lower BMI outcomes, in studies, compared to those of their never- and former-smoker counterparts (Molarius, Seidell, Kuulasmaa, Dobson & Sans, 1997; Kroke, Haftenberger, Hoffman, Boeing & EPIC Working Group on Obesity, 2002), but in many instances they exhibit higher levels of atherogenic and diabetogenic factors commonly associated with obesity or weight. Often, smokers maintain lower BMIs despite tendencies towards engaging in relatively poorer, and countervailing health behaviors (e.g., decreased levels of physical activity, increased consumptions of high-fat containing foods). One explanation for this paradox relates to smoking's effects on the distribution of adipose tissue throughout the body, which differentially influences CVD, diabetes, and diabetes-associated risks (Stein, et al., 2014).

Smoking increases abdominal obesity, and researchers showed in a number of studies that CVD risks increased more sharply among diabetics or non-diabetics as a function of abdominal obesity rather than obesity *per se* (e.g., CVD risk increased independently of BMI status) (Lamarche, 1998). Consistent with such findings, studies also show evidence of associations between abdominal obesity and reduced levels of HDL cholesterol (HDL is protective against CVD), and/or elevated plasma concentrations of triglycerides, apolipoprotein B-100s, LDLs, and very-low-density-lipoproteins (VLDL) (all atherogenic factors) (Lamarche, 1998). Despite a significant degree of overlap between the effects of BMI and abdominal obesity on CVD risk, the two exposures also appear to exert an additive influence on the outcome (Ostchega, Hughes, Terry, Fakhouri & Miller, 2012).

Patterns similar to those observed in studies of abdominal obesity and CVD risk emerge in relation to other types of diabetes symptoms, complications, or related health outcomes (Lamarche, 1998; Cignarelli, et al., 2008). In several studies, researchers demonstrated that increased visceral (i.e., abdominal) fat coincided with decreased insulin sensitivity, or increased

insulin resistance, among participants from obese and non-obese study populations (Lamarche, 1998). Elsewhere, researchers found that plasma concentrations of insulin and glucose increased, disproportionately, among participants with the highest levels of visceral fat, independent of variations in total fat mass, (i.e., BMI) in response their participation in an oral glucose challenge (Lamarche, 1998). They also showed that the risk of developing microalbuminuria increased as a function of waist circumference in diabetic smokers (Cignarelli, et al., 2008). These findings suggest that abdominal obesity increases the risks of diabetes, diabetes progression, and symptoms of renal disease in diabetics. At the same time, as mentioned earlier in this section, smoking increases abdominal obesity independent of its effects on BMI.

d. Conclusion: The effects of smoking on diabetes health

Despite persistent uncertainty regarding the overall effects of smoking on diabetes health, some researchers argue that diabetes confers enhanced vulnerability to additional risk factors for macrovascular and microvascular complications of the disease (e.g., Eliasson, 2003; Ding & Hu, 2007). At present, a more precise understanding of the relationships between smoking behaviors and diabetes complication risks necessitates additional research on the subject, but a preponderance of the evidence favors an understanding of cigarette smoking as a risk factor that increases the likelihood of certain, adverse diabetes-related health outcomes. Regardless of the relationships between smoking and diabetes health, most researchers acknowledge that the myriad benefits of smoking cessation for general health (i.e., non-specific to diabetes) outweigh any of the increases observed in specific risks related to diabetes (e.g., Stein, et al., 2014). Furthermore, pre-eminent diabetes and health organizations (e.g., the World Health Organization (WHO), the American Diabetes Association (ADA), the European Association for the Study of

Diabetes (EASD), and the Centers for Disease Control and Prevention (CDC)) continue to recommend that clinicians consider smoking cessation as a routine component of diabetes care (ADA , 2013a; World Health Organization, 2015; Ryden, et al., 2013; CDC, 2014a; Nagrebetsky, et al., 2014; Fagard, 2009), which attests to the appropriateness of including smoking status among the outcomes evaluated by this thesis' study.

B. Visit frequency

With cigarette smoking established as a maladaptive coping behavior, and a potential mediator between attachment style and diabetes outcomes, this thesis turns its attention to a second putative mediator in the aforementioned pathway: the frequency with which patients visit their primary healthcare providers. Support-seeking constitutes the attachment system's primary strategy for achieving the primary attachment goal (i.e. proximity to attachment figures) (Mikulincer & Shaver, 2007; Bartholomew, et al., 2001); therefore, attachment theory fundamentally contains implications for healthcare utilization. In secure individuals, attachment system activation (i.e., perceived threat) increases the mental accessibility of comforting thoughts about positive interactions with attachment figures, which promotes support-seeking (Mikulincer & Shaver, 2007). Among insecure types, painful attachment experiences created associative memory links between proximity-seeking and rejection or separation, such that perceived threats arouse worries that interfere with desires to seek out support (Mikulincer & Shaver, 2007). A recent study reported a non-specific, significant association between insecure attachment styles and frequent attendance, amid patients from 10 primary care practices in London (Taylor, Marshall, Mann, & Goldberg, 2012). More commonly, however, researchers report discriminative differences in visit frequency between the insecure attachment style subtypes (e.g., Ciechanowski, Sullivan, Jensen, Romano, & Summers, 2003).

Preoccupied individuals purportedly direct higher levels of attention to their bodily sensations as compared to secure or dismissing types (Miller, 2008), and they perceive interoceptive sensation as a potential threat (Stuart & Noyes, 1999; Maunder & Hunter, 2001; Maunder & Hunter, 2012b); they thereby experience higher levels of stress, immediately, but also chronically, over time (Maunder & Hunter, 2008), report higher frequencies and intensities of symptoms of all kinds, and demonstrate greater utilization of healthcare resources (Maunder & Hunter, 2012b). Multiple studies show that people with preoccupied attachment styles experience, or at least report, higher levels of medically unexplained symptoms than individuals with other attachment styles (Martinez, et al., 2012; Ciechanowski, et al., 2002(b); Maunder & Hunter, 2009; Maunder, Lancee, Nolan, Hunter, & Tannenbaum, 2006; Stuart & Noyes, 1999; Miller, 2008; Feeney & Ryan, 1994). Maunder and Hunter (2011) posit that preoccupied individuals utilize healthcare more frequently than others as a result of their relative inability to maintain adequate degrees of confidence in their capacities for coping effectively with their diseases' symptoms and self-management demands. In other words, preoccupied persons' particular healthcare utilization behaviors potentially arise from a palpably lower level of self-efficacy for coping with disease (e.g., Hunter & Maunder, 2001; Maunder & Hunter, 2001; Ciechanowski, et al., 2003; Mikulincer & Florian, 1998; Brenk-Franz, et al., 2015). Maunder and Hunter describe the care-seeking behaviors of anxious/preoccupied patients as "typical of the individual whose inner sense of inability drives them to depend on others, but who invariably find the other's help insufficient, leaving them with near constant anxiety and an unquenchable thirst for soothing" (Maunder & Hunter, 2001). Preoccupied types experience relief only in shallow and transient moments, apart from the amplified perceptions of their illnesses that

effectuate higher levels of healthcare utilization (Maunder & Hunter, 2001; Brenk-Franz, et al., 2015).

Attachment style security exudes protective effects relating to the successful management of certain factors potentially determinative of physical health (Mikulincer & Shaver, 2007). Attachment theory predicts that secure individuals are more likely than insecure individuals to explore and learn about diseases, symptoms, and treatments; consult with appropriate health professionals; purchase health insurance; make health-related decisions; adhere to medical treatments; abstain from risky health behaviors such as overeating, alcohol and drug use, or exposing oneself to other hazardous substances and conditions; and to maintain discipline when dealing with physical illness or painful treatments (Mikulincer & Shaver, 2007; Mikulincer, Florian, & Weller, 1993; Ahrens, et al., 2012). Attachment theory supports an understanding of avoidant (dismissing and fearful) individuals as reluctant to explore novel situations, seek help, or engage in difficult problem-solving, and inclined to suppress distressing thoughts or emotions rather than to cope effectively with their underlying causes (Mikulincer & Shaver, 2007; Brenk-Franz, et al., 2015). Ciechanowski, et al. (2004) further concluded that dismissing and fearful (i.e. avoidant) study participants demonstrated poorer patient-provider communication than other types, while other studies showed that physicians experienced more problematic relationships with both anxious and avoidant participants, compared to their relationships with secure individuals (Mikulincer & Shaver, 2007; Maunder, Lancee, Nolan, Hunter, & Tannenbaum, 2006; Brenk-Franz, et al., 2015).

Research consistently shows that attachment avoidance correlates with weaker tendencies to seek out support (Mikulincer & Shaver, 2007). Concordant with the previous subsection's discussion on coping behaviors, it appears that dismissing and fearful individuals tend to

minimize or deny their attachment needs (Thompson & Ciechanowski, 2002; Simpson, Rholes, & Nelligan, 1992). As patients, they purportedly downplay their medical symptoms, and the severities of their illnesses, while remaining disengaged from relationships with their healthcare providers (Thompson & Ciechanowski, 2002; Hunter & Maunder, 2001; Maunder & Hunter, 2009; Brenk-Franz, et al., 2015). Individuals with a fearful attachment style demonstrate “approach-avoidance behaviors”, consistent with both their general preference for proximity to others, and their general apprehension about the risks associated with closeness (Ciechanowski, Katon, Russo, & Dwight-Johnson, 2002; Thompson & Ciechanowski, 2002; Maunder & Hunter, 2009). Dismissing individuals characteristically appear as invulnerable to their care providers (Thompson & Ciechanowski, 2002; Dozier, 1990). They tend not to elaborate on any of their problems, such as illness, and to minimize any descriptions that they provide of illnesses or other stressors (Thompson & Ciechanowski, 2002; Main, Kaplan, & Cassidy, 1985; McWilliams & Asmundson, 2007; Consedine, et al., 2013). Thompson and Ciechanowski warn clinicians who work with chronically ill patients with have dismissing attachment styles to remain alert to the possibility of worsening medical illness or complications, as patients of this type tend to avoid visits with their healthcare providers and to underreport their symptoms (Thompson & Ciechanowski, 2002; Ciechanowski, Katon, Russo, & Dwight-Johnson, 2002).

Evidence from several studies on attachment style differences in healthcare utilization generally support the theoretical relationships outlined above. In one study, Ciechanowski, et al. reported that patients with preoccupied attachment styles sustained the highest primary care costs and healthcare utilization levels, while patients with fearful attachment styles sustained the lowest (Ciechanowski, et al., 2002). Interestingly, both groups reported high levels of symptoms (Ciechanowski, et al., 2002), which challenges the idea that increased symptom reporting and

increased utilization necessarily concur. Likewise, in a study of patients with a history of periodontitis, researchers found that women with greater attachment anxiety accrued especially high numbers of visits during their active periodontal therapy (Graetz, Ehrental, Senf, Herzog, & Dörfer, 2013). Supporting evidence emanates indirectly from studies that evaluated adults who endured sexual abuse as children, which indicated that such individuals tendered more pain complaints, affiliated with more sites, and demonstrated greater healthcare utilization than the nonabused controls (Fillingim, Wilkinson, & Powel, 1999; Maunder & Hunter, 2001). In another study, Ciechanowski, et al. (2006) reported that dismissing and fearful types missed more scheduled office visits than securely attached individuals, among diabetic patients without major depression (Ciechanowski, et al., 2006). The researchers additionally found that patients with fearful attachment styles indicated a greater number of same-day, but not scheduled office visits, and that those without major depression missed more appointments than their preoccupied or secure counterparts (Ciechanowski, et al., 2006). A third study by Ciechanowski and colleagues showed that patients with ischemic heart disease who presented with negative models of others (fearful and dismissing types) reported greater intentions of delaying care for possible acute coronary syndromes (Sullivan, Ciechanowski, Russo, Soine, Jordan-Keith, Ting, & Caldwell, 2009). Similarly, Feeney and Ryan found an inverse relationship between avoidant attachment and later health care visits, which suggests a degree of reluctance among avoidant individuals for seeking help (Feeney & Ryan, 1994). A similar relationship materialized in Brenk-Franz, et al. (2015), wherein researchers found a negative association between the avoidant dimension of attachment style and health care use. Yet another study by Ciechanowski, et al. (2003) reported an association between the preoccupied attachment style and a lower decrease in pain-related visits (i.e., greater than weekly pain-related visits) over the course of 12

months, pursuant to participants' involvements in a structured pain program, as compared to the relative decreases in visits by secure, fearful, and dismissing study participants, among patients receiving care for chronic pain. Consedine, et al. reported that dismissingness predicted less frequent prostate-specific antigen testing and digital rectal examination among black men ranging in age from 45 to 70 years old, although attachment security also predicted lower screening frequency in their study (Consedine, Tuck, & Fiori, 2013). In multiple studies, researchers indicated that dismissing adults displayed a decreased willingness to seek out, or engage in, various forms of psychotherapy (Dozier, 1990; Riggs, Jacobvitz, & Hazen, 2002; Caspers, Yucuis, Troutman, & Spinks, 2006).

Patient compliance generally corresponds to visit frequency (Slinin, Guo, Li, Liu, Morgan, Ensrud, Gilbertson, Collins, Ishani, 2012). Mentari, et al. showed that patients with end stage renal disease who underwent treatment at facilities reporting lower visit frequency appeared 2.67 times more likely to present as non-compliant (Mentari, DeOreo, O'Connor, Love, Ricanti, & Sehgal, 2005). The current thesis essentially conceptualizes visit frequency as a matter of patient compliance, modulated by attachment style. However, numerous additional factors contribute to visit frequency, which include certain characteristics of patients, providers, and healthcare facilities (Slinin, et al., 2013; Fontil, Bibbins-Domingo, Kazi, Sidney, Coxson, Khanna, Victor, & Pletcher, 2015). For example, several studies' researchers reported an association between higher medical comorbidity, or greater illness severity, and increased odds of seeing one's provider more frequently (Slinin, et al., 2013; Roos, Carriere, & Friesen, 1998; Schwartz, Woloshin, Wasson, Renfrew, & Welch, 1999; DeSalvo, Block, Munter, & Merrill, 2003; Welch, Chapko, James, Schwartz, & Woloshin, 1999). Severity of illness drives the frequency of provider visits in most medical settings (Slinin, et al., 2013; Roos, et al., 1998; Schwartz, et al.,

1999; DeSalvo, et al., 2003), but additional patient characteristics shown to influence visit frequency encompass age, prior health care use, out-of-pocket medical expenses, prescribed medications, employment status, gender, distance traveled to health care facilities, and mental health issues (Slinin, et al., 2013; Fontil, et al., 2015; Tak, Hougham, Ruhnke, & Ruhnke, 2014). At the level of the provider, healthcare practices reflect individuals' beliefs regarding the benefits of more frequent patient visits. Physicians who dedicate large portions of their practices to research, administration, or teaching tend to endorse less frequent visits than nonacademic physicians, and to also remain less responsive to reimbursement incentives that ostensibly shape most physicians' behaviors (Desai, Bolus, Nissenson, Bolus, Solomon, Khawar, Gitlin, Talley, & Spiegel, 2008; Slinin, et al., 2013; Fontil, et al., 2015). The geographic location of a facility affects visit frequency, and greater in-office or out-of-office waiting times serve as impetuses for reducing physician visits (Tak, et al., 2014; McGlade, Bradley, Murphy, & Lundy, 1988; McCarthy, McGee, & O'Boyle, 2000). Of course, waiting times relate to provider availability, which implicates attachment styles (via the perceived availability of attachment figures), as well as trust. Research shows that limited access to care providers and shortened appointment times represent organizational changes that cogently undermine patients' trust in their providers or the healthcare system in general (Freburger, et al., 2003).

Healthcare utilization behaviors sometimes play a role in determining the quality of healthcare that diabetic individuals receive from their providers, and the quality of their diabetes health-related outcomes. Research suggests that increasing the frequency of patient-provider encounters not only yields more opportunities for treatment intensification, but also promotes higher levels of treatment adherence (Patel, Crimson, Miller, & Johnsrud, 2005; Fontil, et al., 2015). For example, Morrison, et al. found that the amount of time that it took to control various

diabetes health targets (e.g., HbA1c, blood pressure, LDL) decreased progressively as visit frequency increased, up to a frequency of one visit every two weeks (Morrison, Shubina, & Turchin, 2011), and Ciechanowski, et al. found that lower levels of support-seeking amid diabetic patients corresponded with poorer treatment adherence and worse scores on diabetes health indicators, as well as to dismissing and/or fearful attachment styles (Ciechanowski, et al., 2010; Ciechanowski, et al., 2004; Ciechanowski, et al., 2006; Turan, et al., 2003). Nevertheless, investigators in other studies implied that preoccupied individuals' unrelenting concerns about their physical health statuses led to excessive care-seeking, which involved them, more frequently, in confusing webs of health care providers not closely engaged in communication with one another, and resulted in noticeably inconsistent patterns of healthcare that some authors deemed a "fragmentation of the agents of care" (Maunder & Hunter, 2009; Maunder & Hunter, 2004). Fenton, et al., found that patients who visited with their physicians infrequently failed to receive the recommended levels of preventive care services (Fenton, et al., 2006). The researchers also reported that study participants with higher frequencies of out-patient visits for relatively low priority conditions incurred higher risks of deferments for preventive diabetes healthcare services (Fenton, et al., 2006). The latter result implicates preoccupied/anxious individuals, to whom researchers generally attribute amplified expressiveness, hypervigilance to both real and perceived threats, a chronic sense of vulnerability or personal fragility, a strong need for maintaining emotional closeness with others, and a high level of dependency (Martinez, et al., 2012; Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2007). Both Fontil, et al., and Guthmann, et al. concluded that visit frequency significantly affected hypertension management (Fontil, et al., 2015; Guthmann, Davis, Brown, & Elizondo, 2005), with more frequent visits related to better blood pressure outcomes. Likewise, Karter, et al. found an

association between greater rates of missed appointments and significantly poorer glycemic control, such that those who missed > 30% of their scheduled appointments sustained adjusted mean HbA1c values 0.70 to 0.79 points higher than that of participants who attended all of their appointments (Karter, Parker, Moffett, Ahmed, Ferrara, Liu, & Selby, 2004). Additional evidence indicates that greater visit frequency covaries with a lower risk of death (McClellan, Soucie, & Flanders, 1998) and less hospitalizations (Slinin, Guo, Li, Liu, Ensrud, Gilbertson, Collins, & Ishani, 2012). Viewed collectively, these findings indicate that visiting one's healthcare provider either too frequently or too infrequently leads to sub-optimal care and/or a problematic patient-provider relationship.

The avoidance of visits with health care providers conceivably falls under the purviews of both trust in the patient-provider relationships (discussed in the forthcoming subsection of this thesis), and maladaptive coping behaviors. Some individuals likely seek relief from their anxieties about their illnesses through avoiding related encounters with their health care providers, even though such a behavior appears to increase their probabilities of sustaining negative health outcomes. Indeed, experts acknowledge that receiving help from people constitutes a major coping activity (Wilcox & Vernberg, 1985; Sherbourne & Stewart, 1991). Moreover, significant research shows evidence of associations between higher levels of trust in healthcare providers and greater utilizations of preventative services (O'Malley, Sheppard, Schwartz, & Mandelblatt, 2004; Hillen, et al., 2011). Therefore, the current thesis proposes to interpret its findings with respect to visit frequency in relation to both trust in providers and maladaptive coping behaviors.

C. The patient-provider relationship

Considerable research and theory advances the patient-provider relationship as an important factor in successfully delivering health care (e.g., Brincks, Feaster, Burns, & Mitrani, 2010; Kerse, Buetow, Mainous, Young, Coster, & Arroll, 2004; Murray & McCrone, 2014; Boyer & Luftey, 2010; Brennan, et al., 2013; Polinski, et al., 2014), and achieving optimal outcomes in patients with diabetes and other chronic illnesses (e.g., Kaplan, Greenfield, & Ware, 1989; Ritholz, Beverly, Brooks, Abrahamson, & Weinger, 2014; Ciechanowski & Katon, 2006; Ciechanowski, et al., 2001; Mancuso, 2010; Feeney, 2000; Levy, et al., 2011; McWilliams & Bailey, 2010; Nam, Nam, & Song, 2014; Jackson, Adibe, Okonta, Ukwe, 2015; Lee & Lin, 2011; Maddigan, et al., 2005). The very existence of the patient-provider relationship predicates on patients seeking treatment for their illnesses and health care needs (Boyer & Luftey, 2010). This type of help-seeking behavior, which proves critical for understanding how patient-provider relationships unfold and how subsequent uses of health services evolve (Boyer & Luftey, 2010), implicates the attachment system (Ciechanowski, et al., 2010; Hunter & Maunder, 2001; Hinnen, et al., 2014; Mikulincer & Shaver, 2007; Ciechanowski & Katon, 2006a; Ciechanowski, et al., 2003; Wearden, et al., 2003; Ciechanowski, et al., 2006b; Maunder & Hunter, 2012b). Moreover, attachment theory lends itself to understanding patients' relational and interactional preferences, which plausibly enhance medical encounters, and thus treatment outcomes (Hooper, et al., 2012; Ciechanowski & Katon, 2006; Maunder & Hunter, 2012b).

Attachment theory provides one means of classifying relationships between patients and their health care providers (Hooper, et al., 2012; Ciechanowski, 2007; Ciechanowski, 2010). In fact, Ciechanowski, et al. construed attachment style as “a systematic way of understanding patients' perceptions of and ability to collaborate in health care relationships” (Ciechanowski, et al.,

2002). It delineates a framework that explains the impact, and transmission, of parent-child attachment relationships to the patient-physician relationship (Hooper, et al., 2012; Miller, 2008; Thompson & Ciechanowski, 2003). Attachment styles characterize the health behaviors that patients engage in, as much as they impart the ways in which patients tend to interact with others (including providers). The paradigm holds potential for helping health care providers to anticipate, or predict, how to best relate to and treat their patients—an important tool for encouraging chronically ill patients to schedule and attend their appointments regularly, adhere to their treatment plans, and/or collaborate on co-creating patient-centered treatment goals, among other activities (Hooper, et al., 2012; Arbuthnott & Sharpe, 2009; Maunder & Hunter, 2012b; Miller, 2008; McWilliams & Bailey, 2010).

An insecure attachment style in adulthood threatens to negatively influence a patient's relationship with their health care provider, along with their health-related behaviors, and physical or psychological health outcomes (Hooper, et al., Miller, 2008; Salmon & Young, 2009; Huntsinger & Luecken, 2004; Feeney, 2000; Ciechanowski, 2007; Ciechanowski, 2006b; Ciechanowski, et al., 2010; Ciechanowski, et al., 2002b; Ciechanowski & Katon, 2006), via its effects on healthcare utilization behaviors. Bowlby alleged that attachment figure availability and responsiveness promotes the formation of a relatively stable sense of attachment style security, which builds confidence in support-seeking as a viable distress-regulation strategy, while unreliable attachment figures tend to precipitate failures in the proximity-seeking behaviors of affected individuals, in addition to reduced levels of attachment style security and abnormal affect regulation strategies (Bowlby, 1982; Mikulincer & Shaver, 2008; Bartholomew & Horowitz, 1991; Clark & Shaver, 1998). Several studies linked insecure attachment styles to problematic clinical relationships (Clark, Beesley, Holcombe, & Salmon, 2011; Salmon &

Young, 2009; Ciechanowski, et al., 2001; Ciechanowski, et al., 2002a; Maunder, Panzer, et al., 2006; Ciechanowski & Katon, 2006), and a number of others indicate the existence of associations between attachment style insecurity and treatment non-adherence (Ciechanowski, et al., 2001; Ciechanowski, et al., 2002a). One study found that breast cancer patients with insecure attachment styles experienced poorer senses of alliance with their surgeons (Pegman, Beesley, Holcombe, Mendick, & Salmon, 2011), and another showed that insecure patients expressed poorer abilities to feel fully supported by their medical staff (Salmon, Holcombe, Clark, Krespi, Fisher, & Hill, 2007). Maunder and Hunter suggested that differences in attachment styles affect individuals' capacities to be soothed by or accept help from their healthcare providers (Hunter & Maunder, 2001). When providers clearly understand their patients' needs and provide the appropriate levels of empathy, compassion, and support, patients tend to participate more fully in their treatments, which results improved treatment adherence (Hooper, et al., 2012; Ciechanowski, et al., 2004; Ciechanowski & Katon, 2006). In a qualitative study of type 2 diabetics, participants who perceived their providers as non-judgmental experienced greater comfort with disclosing information about their inadequate insurance coverages, which allowed them to negotiate around certain components of their treatment plans (Ciechanowski & Katon, 2006). Consistent with this latter finding, Mikulincer & Nachshon reported a negative association between attachment avoidance and self-disclosure (Mikulincer & Nachson, 1991; Bartholomew, et al., 2001). In short, attachment theory potentially capacitates health care providers to apply best practices, and to deliver optimal care to patients who derive from diverse populations and present with diverse needs, as well as divergent attachment style orientations.

Numerous studies linked the patient-provider relationship to treatment adherence, patient satisfaction, and various other types of health-related outcomes (e.g., Hooper, 2012; Feeney, 2000; Levy, et al., 2011; Ciechanowski & Katon, 2006; McWilliams & Bailey, 2010; Kaplan, et al., 1989; Arbuthnott & Sharpe, 2009; Mikulincer & Shaver, 2007). Ciechanowski, et al., (2004) found that participants' levels of satisfaction with the quality of care that they normally received from their primary healthcare providers mediated associations between attachment style and diabetes outcomes (blood glucose and diabetes treatment adherence indicators). The researchers reported similar findings in a study from 2001 and, together, the two studies suggest that diabetes outcomes tend to differ by the degrees of collaboration that arise between diabetic patients and their primary healthcare providers (Ciechanowski, et al., 2001; Ciechanowski, et al., 2004). In other studies, researchers showed that patients who maintained poorer relationships with their healthcare providers adhered less fully to their treatment regimens (Brincks, et al., 2010; Piette, Heisler, Krein, & Kerr, 2005; Roberts, 2002; Schneider, Kaplan, Greenfield, Li, & Wilson, 2004; Nam, et al., 2014; Maddigan, Majumdar, & Johnson, 2005). Arbuthnott and Sharpe (2009) reported that better patient-physician collaboration resulted in better patient adherence, whereby the authors argued that “the inclusion of the patient’s perspective during the consultation is essential to obtaining cooperation once the patient has left the physician’s office”. This idea arguably applies most fully to patients with dismissing attachment styles, who likely reject advice in instances where it involves relinquishing control to others (Maunder & Hunter, 2012).

One definition of the patient-provider relationship (termed the “physician-patient relationship”) renders it as “[a] formal or inferred relationship between a physician and a patient, which is established once the physician assumes or undertakes the medical care or treatment of a patient”, and denotes that the relationship exists in certain situations (e.g., when the physician

sees the patient in a private office), but not in others (e.g., when the doctor administers a screening measure in connection with research) (Physician-patient relationship, n.d.). Other definitions invoke trust and/or attachment-relevant concepts (e.g., care-seeking behaviors). For example, a particular legal definition of the physician-patient relationship includes the stipulation that it “is regarded as a fiduciary relationship, in which mutual trust and confidence are essential” (Patient-physician relationship law and legal definition, n.d.), and another understands the concept as “a consensual relationship in which the patient knowingly seeks the physician’s assistance and in which the physician knowingly accepts the person as a patient (*Bovara v. St. Francis Hospital*, 1998). The latter definition conceivably designates most individuals who possess a dismissing attachment style as displaced from the patient-provider relationship, and the former anchors the patient-provider relationship in trust. The concept of trust permeates the literature on relationships of dependency between experts and non-experts, which often arise in the context of situations involving uncertainty and risk (Brennan, Barnes, Calnan, Corrigan, Dieppe, & Van entwistle, 2013; Salmon & Young, 2009). The asymmetrical patient-provider relationship exemplifies this contingency (Frederiksen, Kragstrup, & Dehlholm-Lambertsen, 2010; Hillen, et al., 2011), and particularizes a prime example of “a trust relationship” (Brennan, et al., 2013). Concordantly, some researchers view trust as a characteristic that denotes the depth of the patient-provider relationship (Hillen, et al., 2011; Ridd, Shaw, Lewis, & Salisbury, 2009).

i. Trust: An elusive concept

Long before researchers first engaged in empirical investigations on the concept of trust, medical discourse recognized the salience of trust to the context of patient-provider relationships (Hall, Dugan, Zheng, & Mishra, 2001; Mechanic, 1998; Pellegrino, Veatch, & Langan, 1991; Titmuss, 1968). Medical ethics, healthcare law, and healthcare policy each concerned itself,

preveniently, with substantiating the fundamental goals of preserving, enhancing, and justifying trust (Hall, Zhang, et al., 2001; Mechanic & Schlesinger, 1996; Mechanic, 1998; Carter, 1989; Pellegrino & Thomasma, 1993; Rhodes & Strain, 2000). Instruments designed specifically for evaluating trust in the context of healthcare eventuated only recently (Hall, Camacho, Dugan & Balkrishnan, 2002; Bova, Route, Fennie, Ettinger, Manchester, & Weinstein, 2012), with the first measure of trust in the healthcare provider published in 1990 (Anderson & Dedrick, 1990; Hall, et al., 2002; Freburger, et al., 2003). Thereupon, a limited understanding now exists with respect to precise operational definitions of trust in the arena of healthcare research (Lee & Lin, 2009; Hall, 2006; Pearson & Raeke, 2000; Rolfe, Cash-Gibson, Car, Sheikh, & McKinstry, 2014; Becker & Roblin, 2008; Ozawa & Sripad, 2013; Hall, Camacho, et al., 2002; Hall, Zheng, Dugan, Camacho, Kidd, Mishra, & Balkrishnan, 2002; Hall, et al., 2001), even as connatural, theoretical expositions ostensibly abound (e.g., Lewicki, Tomlinson & Gillespie, 2006; McKnight & Chervany, 1996; Wrightsman, 1991).

Across research on trust, numerous definitions of the construct disparately, and selectively, emphasize myriad theoretical, constitutive dimensions (Rolfe, et al., 2014); Among them, inconsistencies and deficits give way to immoderate confusion, which forestalls a substratal excogitation of trust's intrinsic affections, differentia, and purview (e.g., McKnight & Chervany, 2001; Romano, 2003; Clark & Payne, 1997; Lewicki, et al., 2006). The cardinal assumptions of several trust and attachment theories fall prey to primary derelictions in research, as a matter of course, giving way to prejudicial evidence (e.g., oblique and/or delusory findings) that obfuscates substantively comprehensive definitions of trust. Extant trust definitions construe the construct as both a noun and a verb (e.g., Barber, 1983) and variously equate it with a personality trait (e.g., Rotter, 1971; Rosenberg, 1957; Erikson, 1968; Wrightsman, 1981), a

belief (e.g., Lindsfold, 1978; McAllister, 1994), a structural phenomenon (e.g., Shapiro, Sheppard & Cheraskin, 1992; Shapiro, 1987; Lewis & Weigert, 1985), an emotion (e.g., McAllister, 1994; Rempel, Holmes, & Zanna, 1985), a behavior (e.g., McKnight & Chervany, 1996; Cummings & Bromiley, 1996), an attribute of the trustor (e.g., Husted, 1990; Giffin, 1967; Blakeney, 1986; Gaines, 1980), an expectancy (e.g., Rempel, et al., 1985; Barber, 1983), a rational choice mechanism (e.g., Williamson, 1993), and/or a behavioral intention (e.g., Curall & Judge, 1995; Scanzoni, 1979). Collectively, trust conceptualizations coalesce to define the concept in excessively broad terms (McKnight & Chervany, 1996); individually, they define it too narrowly (e.g., in terms that reflect the paradigm of only one academic discipline). The resulting dynamic produces an erudition so tortuous and recondite that it engenders iterant derogation by scholars who, by turns, designate the associated literature as a “conceptual confusion” (Lewis & Weigart, 1985), “bewildering array” (Taylor, 1989), “very complex and entwined literature” (Lewicki, et al., 2006), “confusing potpourri” (Shapiro, 1987), and even “conceptual morass.” In short, trust considerably remains an “elusive” concept (e.g., McKnight & Chervany, 2001; McKnight & Chervany, 1996; Romano, 2003). The forthcoming subpart of this thesis, therefore, provides the reader with a practicable typology of trust to inform a further discussion on the subject.

ii. A typology of trust

Some researchers demarcate two contradistinguished categories of trust definitions, coterminous with two differentiated traditions in trust theory (e.g., Lewicki, et al., 2006; Kramer, 1999; Romano, 2003): 1) a behavioral tradition that conceptualizes trust as a rational-choice behavior, readily ascertainable in individuals’ overt trust-related actions (e.g., Lewicki, et al., 2006; Hardin, 1993; Williamson, 1981; Curall & Judge, 1995; Burt & Knez, 1996; Sheppard &

Sherman, 1998; Flores & Solomon, 1998), and 2) a psychological tradition that aims to comprehend trust in terms of associated, complex interpersonal states (e.g., individuals' expectations, intentions, affects, or dispositions) (e.g., Rousseau, Sitkin, Burt & Camerer, 1998; Mayer, Davis, & Schoorman, 1995; Jones & George, 1998; McAllister, 1995; Romano, 2003; Lewicki, et al., 2006). The psychological tradition of trust contains trust definitions that accord with three different models: 1) a unidimensional model that treats trust as the bipolar opposite of distrust; 2) a two-dimensional model that regards trust and distrust as two separate dimensions, each with the capacity to vary independently; and 3) a transformational model, that maintains that trust manifests in many different forms, which emerge and develop over time (e.g., Lewicki, et al., 2006; Hillen, et al., 2011). Transformational models then break trust down into types, which correspond to different stages that a relationship progresses through over time. For example, three individual models conceptualize trust with stages or types that consist of: 1) a) fragile trust, which permits actors to deal with one another, but only in guarded ways, and b) resilient trust, which rests on the predictability of the goodwill of others; 2) a) knowledge-based trust that entails knowing the other sufficiently well, so as to anticipate their behaviors, and b) identification-based trust that entails the full internalization of others' desires and intentions (Lewicki & Bunker, 1995); and 3) a) cognition-based trust, that grounds trust in individuals' beliefs about others' dependabilities, reliabilities, and professionalism, and b) affect-based trust, that grounds trust in the emotional bonds that connect independent parties to one another in a relationship (McAllister, 1995).

Behavioral definitions of trust operationalize the eponymous construct on the level of cooperative or collaborative behaviors (e.g., information disclosure, treatment adherence), such that any observable shift in an individual's level of cooperation with their trustee allegedly

signifies a true shift in their trust, regardless of the reason that the shift in their behavior occurred (Lewicki, et al., 2006; Axelrod, 1984). That is, the behavioral tradition grounds trust in observable choices, made by a specific actor (or actors) in an interpersonal context (Lewicki, et al., 2006; Flores & Solomon, 1998). Notwithstanding, cooperative behaviors potentially fluctuate as a result of factors unrelated to trust (e.g., a change in medications, from ones with fewer side-effects to ones with more or unpleasant side-effects), and this results in difficulties with accurately inferring trust from cooperative behaviors, amid multiple sources of error (e.g., Romano, 2003; Lewicki, et al., 2006; Kee & Knox, 1970). In one example, material to this thesis, of a study about attachment style and health behaviors that essentially employed a behavioral definition of trust, researchers construed trust as 1) the number of physical symptoms that a patient reported to their primary care provider (i.e., their degree of self-disclosure); and/or 2) the number of primary care visits/amount of medical costs incurred by a patient (i.e., the frequency of their interpersonal interactions with their provider) (Ciechanowski, et al., 2002).

The psychological tradition of trust theory regards its central construct as an emic phenomenon that necessitates a reliance, by researchers, on participants' self-reported outcomes from measures of their applicative cognitive/affective processes. This type of approach allows for researchers to additionally incorporate a behavioral indicator of trust, but retains the possibility that trust results from factors that extend beyond simply strict rationality (Lewicki, et al., 2006). In contemplation of some examples, Ciechanowski, et al. designated participants' self-reports of their abilities to rely on other people as an indicator of trust in one study (Ciechanowski, Katon, & Russo, 2005), and in a second study the researchers substituted an attachment style measure for a mensuration of participants' views of other people's trustworthiness (Sullivan, Ciechanowski, Russo, Soine, Jordan-Keith, Ting, & Caldwell, 2009).

The current thesis analyzes data about trust collected in connection with another study that Ciechanowski, et al. designed. It utilizes a hybrid approach to evaluating trust, as both a behavior (i.e., the number of primary care visits that a patient attended over the course of a year) and a cognitive/affective outcome (i.e., the patient's perceived trust of their primary healthcare provider).

Proponents of psychological definitions of trust often reject the practice of employing behavioral trust measures, altogether (e.g., Romano, 2003; McKnight & Chervany, 1996). They argue that trust conceivably occurs in the absence of observable trusting behaviors, and that such behaviors, conversely, conceivably occur in the absence of trust (Luhmann, 1988; Romano, 2003). Furthermore, some trust researchers argue that trusting behaviors (e.g., dependency, collaboration, disclosure) represent merely potential outcomes of trust, and not trust itself (McKnight & Chervany, 1996; Romano, 2003; Mayer, et al., 1995; Powell, 1996). In defense of behavioral definitions of trust, other researchers proffered two potential solutions to some of these two problems: They proposed that researchers using behavioral trust definitions: 1) restrict their definitions of trust to include only those actions that occur in the presence of significant risk; and 2) treat trust behaviors as latent constructs (e.g., "Trusting Behavior") with measurable indicators (McKnight & Chervany, 1996). The latter suggestion aims to establish a distinction between specific behaviors that researchers oftentimes refer to as trust, and those that fall under the purview of a construct such as "Trusting Behavior", which encompasses trust behaviors in a more general sense (McKnight & Chervany, 1996). It attempts to insert some distance between those specific instances of trust that opponents consider as representing mere consequences of trust and a definitive trust indicator (e.g., "Trusting Behavior") (McKnight & Chervany, 1996). With respect to the former stipulation, the concept of risk insinuates conditions that arise when

one individual gives some measure of their power or control to another individual and, therefore, trust refers to some act that concerns a willful incurrence of personal risk (Mayer, et al., 1995; McKnight & Chervany, 1996; Lorenz, 1993; Ring & Van de Ven, 1994; Hall, et al., 2001; Lewicki, et al., 2006).

Within the psychological tradition of trust, unidimensional models conceptualize the construct as an individual difference that resides at one end of a single, antipodean spectrum, with distrust occupying the opposite end (Rotter, 1971; Lewicki, et al., 2006; Mayer, et al., 1995; Cummings & Bromiley, 1996). Put differently, unidimensional models effectively equate low trust with high distrust. According to some theorists, this model constitutes “the typical approach to [understanding] trust” in trust research (Lewicki, McAllister, & Bies, 1998; Lewicki & Brinsfield, 2012). By contrast, the two-dimensional models of trust (and certain instances of the transformational models) enable trust and distrust to coexist simultaneously, and for the two constructs to vary independently of one another (Lewicki, et al., 2006; Romano, 2003; Luhman, 1979; Luhman, 1988; Hillen, et al., 2011). This involves incorporating two separate continua for trust (ranging from high to low), and distrust (also ranging from high to low), with the causatum that low levels of trust no longer ineluctably coincide with high levels of distrust (Lewicki & Brinsfield, 2012; Lewicki, et al., 2006; Luhman, 1989; Hillen, et al., 2011). To render this idea more concrete, consider the circumstance in which trust coequals the affective states of hope, faith, and confidence at one end of its spectrum (i.e., high trust) and hopelessness, uncertainty about a trustee’s disposition, and hesitancy at the opposite end (i.e., low trust), while distrust concurrently occupies a space that resides between fear, skepticism and vigilance on the one hand (i.e., high distrust), and fearlessness, confidence, and insouciance on the other hand (Lewicki, et al., 2006; Lewicki & Brinsfield, 2012). This eventuality demonstrates a case in

which trust and distrust inhabit two related, but distinctive, and different spheres of underlying dimensions (i.e., their affective manifestations).

Finally, transformational models of trust apprehend the construct as undergoing transmogrifications over various intervals of time (Lewicki, et al., 2006; Boon & Holmes, 1991; Rousseau, et al., 1998). They aim to understand interpersonal trust in the context of a developing relationship, as it transforms from one type of relationship into another (Lewicki, et al., 2006; Shapiro, et al., 1992; Lewicki & Bunker, 1995; Lewicki & Bunker, 1996). The models of this type involve demarcating various stages through which an interpersonal relationship conceivably passes, as it progresses towards some maximal level of intimacy (Lewicki, et al., 2006). They allow for interpersonal relationships to not only progress over time, but also to regress, and/or even for multiple stages of a relationship to overlap with one another simultaneously (Lewicki, et al., 2006). The cross-sectional data employed by this thesis precludes the possibility of understanding trust as accordant to a transformational model, and the associated measure lacks a separate dimension for distrust.

iii. Trust and attachment theory

a. The existence of trust dispositions, and evidence of their associations with attachment styles

Discussions of attachment theory and trust ineluctably invoke questions about whether individuals practicably manifest discernible patterns of trusting behaviors and, if they do, whether their attachment styles cogently allineate with them. Considerable research supports the understanding that dispositions to trust exist, and that they occur alongside particular attachment style subtypes. In several trust studies, researchers found that participants differed in their

assents to general inclinations towards trust (e.g., Gaines, Panter, Lyde, Steers, Rusbult, Cox & Wexler, 1997; Mayer, et al., 1995; Van Dyne, Vandewalle, Kostova, Latham & Cummings, 2000; Wrightsman, 1991; Harnett & Cummings, 1980; Johnson-Georges & Swap, 1982; McKnight, Cummings & Chervany, 1998; Kramer, 1999; Lewicki, McAllister & Bies, 1998; McKnight, Kacmar & Choudhury, 2004; Sato, 1988). Other studies showed that attachment style insecurity generally predicted lower levels of interpersonal trust (e.g., Mikulincer, 2004; Simpson, 1990; Pistole, 1993; Mikulincer, 1998; Cassidy, 2001; Holwerda, et al., 2013).

Elsewhere in research, investigators revealed associations between attachment style security-related constructs and trust, such that higher levels of participant satisfaction (Levy & Davis, 1988; Pistole, 1989), intimacy (Levy & Davis, 1988), interdependence and/or commitment (Simpson, 1990) predicted elevated levels of interpersonal trust (Pistole, 1993). They additionally found that attachment style security covaried with greater admeasurements of partner-directed trust by some studies' participants (e.g., Brennan & Shaver, 1995; Feeney & Noller, 1990; Hazen & Shaver, 1987; Levy & Davis, 1988; Simpson, 1990), and that trusting relationships tended to lend themselves to increased dispensations towards attachment style security (e.g., Larzerele & Huston, 1980; Mikulincer, 1998; Kahn & Kram, 1994; Rothbard & Shaver, 1994; Hazen & Shaver, 1990; Brennan & Shaver, 1995; Feeney & Noller, 1990; Hazen & Shaver, 1987; Levy & Davis, 1988; Simpson, 1990).

Trust theorists propose that interpersonal trust incorporates individuals' defined sets of beliefs (i.e., expectations or expectancies) about the most likely behaviors of their relationship partners, especially under conditions of imminent risk (e.g., Rotenberg, 2010; Dunn & Schweitzer, 2005; Holmes & Rempel, 1989). Positions of trust reflect confident expectations of positive outcomes at the hands of intimate partners (e.g., Deutsch, 1973; Holmes & Rempel,

1989). Trust expectancies theoretically center on individuals' perceptions of their relationship partners' general attitudes regarding interpersonal relationships, and on the qualities of their affectional attachment bonds (Holmes & Rempel, 1989; Rempel, Holmes, 1981; Rempel, Holmes & Zanna, 1985; Sternberg & Barnes, 1985; Mikulincer, 1998; Lewicki & Bunker, 1995; McAllister, 1995). Some researchers proposed that the core expectations that comprise individuals' attitudes of trust focus principally on their perceptions of their attachment figures' responsiveness (Mikulincer, 2004; Holmes & Rempel, 1989; Mikulincer, 1998; Shaver & Hazen, 1993; Hazen & Shaver, 1990; Hardy & Barkham, 1994; Rempel, Holmes & Zanna, 1985), and/or on the availabilities and benevolence of their working models' components (Shaver & Hazen, 1993; Mikulincer, 2004; Bartholomew, 1990; Bartholomew & Horowitz, 1991). Even more directly, one prominent attachment theorist averred that betrayals of trust embody assaults on individuals' internal working models (Mikulincer, 2004).

Disparities in trust, by attachment style categories, arise between individuals with respect to their 1) trust-related memories' accessibilities and affective qualities (e.g., Mikulincer, 1998; Collins & Read, 1994; Main, Kaplan & Cassidy, 1985; Mikulincer, 2004; Baldwin, Keelan, Fehr, Enns & Koh-Rangarajoo, 1996; Mikulincer & Orbach, 1995; Main, Kaplan & Cassidy, 1985); 2) cognitive appraisals of their trust-related experiences and/or attachment figures (e.g., Mikulincer, 1998; Mikulincer, 2004; Baldwin, et al., 1993; Collins, 1996) 3) trust-related goals in interpersonal interactions (e.g., Mikulincer, 1998; Collins & Read, 1994; Mikulincer, 1993; Mikulincer & Nachson, 1991; Mikulincer, 2004; Shaver & Hazen, 1993; Bowlby, 1988; Mikulincer, 2004; Main, et al., 1995; Mikulincer, Florian, & Tolmacz, 1990; Baldwin, et al., 1993); and 4) coping strategies for dealing with significant degrees of interpersonal distress (i.e., especially distress resulting from trust-violation events) (e.g., Mikulincer, 1998; Collins & Read,

1994; Mikulincer, et al., 1990; Bowlby, 1988; Mikulincer & Florian, 1998; Mikulincer, 2004; Shaver & Hazen, 1993; Mikulincer, Florian & Weller, 1993; Birnbaum, Orr, Mikulincer & Florian, 1998; Levy & Davis, 1988; Pistole, 1989; Scharfe & Bartholomew, 1995). As advanced from a slightly different angle, some researchers conceptualize attachment style as the “systematic pattern of relational expectations, emotions, and behaviors that results from the internalization of a particular history of attachment experiences” (Fraley & Shaver, 2000; Shaver & Mikulincer, 2002; Mikulincer, 2004). Still others propose that attachment styles’ working models contain at least four components that consist of 1) memories of attachment related experience; 2) beliefs, attitudes, and expectations about the self and others in relation to attachment; 3) attachment-related goals and needs, and; 4) strategies and plans associated with achieving attachment goals (i.e., Collins & Read, 1994). Each of these components bears upon individuals’ perceptions of trust and willingness to trust.

Theoretically, attachment style working models relate closely to the ways in which people construe and process their trust-related memories (Mikulincer, 1998). Secure adults incline to suppress their trust-related memories that threaten to evoke, within them, overwhelming doubts about their attachment figures’ trustworthiness, and/or that imperil (i.e., overwhelm) their capacities to cope effectively with experiences causing interpersonal distress (Bartholomew, Kwang & Hart, 2001; Mikulincer, 1998; Hazen & Shaver, 1987; Feeney & Noller, 1990; Collins & Read, 1994). Otherwise, securely attached adults possess ready access to their trust-related memories (e.g., Mikulincer, Shaver, Cassidy & Berant, 2009). Baldwin, et al. (1996) found that secure study participants reported more positive, available and accessible examples of their interpersonal relationships, as compared to the insecure types (Baldwin, et al., 1996). This outcome accords to the commonly purported theoretical supposition that avoidantly

attached individuals repress their negative memories to a relatively greater extent than secure individuals (e.g., Main, et al., 1985; Mikulincer & Orbach, 1995; Mikulincer, 1998).

Furthermore, Mikulincer, et al. (1998) demonstrated that the secure study participants recalled experiencing more trust-validation events than the insecure participants in one study, and that secure types more likely perceived the events as stable and important. Contrastively, anxious/preoccupied individuals' penchants for hypervigilance to threats against attachment security increased the accessibilities of their trust-related memories (Mikulincer, 1998). Collins and Read reported that anxious study participants explained certain events in a manner that indicated lower levels of confidence in their romantic partners' love and securities, lower trust, and stronger beliefs in intentional rejection by their partners, as compared to the beliefs of their secure study participants (Collins & Read, 1994). They found that adults who differed as to their attachment styles proceeded to construe a specific trust-related event (i.e., the same for everyone) in ways that differed quite markedly from one another (Collins & Read, 1994).

From the perspectives of trust theorists, trust dispositions differentiate between attachment style patterns along some essential dimensions (i.e. components) of trust, including beliefs about partners' dependabilities, reliabilities, and beneficence, and confidence in partners' responsivities (Rempel, Holmes & Zanna, 1995; Deutsch, 1973; Rotter, 1980; Scanzoni, 1979; Lee & See, 2004; Baldwin, Fehr, Keedian, Seidel & Thompson, 1993; Shaver & Hazen, 1993; Mikulincer, 1998). This eventuality colludes with attachment theorists' presumptions that core components of attachment styles (e.g., expectations about the trustworthiness of self or others in interpersonal situations; distinctive goals that determine individuals' relationship behaviors and/or responses in social situations) predicate on trust-related experiences (Collins & Read, 1994; Shaver, Collins & Clark, 1996; Mikulincer, 1998; Shaver & Hazen, 1993; Holmes &

Rempel, 1989). Consistent with these sensibilities, one study suggested that individuals with attachment style security expected their relationship partners to respond more positively towards them, under conditions that require dependency (therefore, trust), compared to the analogous partner expectations of the insecure study participants (e.g., Baldwin, et al., 1993; Baldwin, et al., 1996). Other studies' investigators reported that secure individuals responded more strongly (i.e., quickly) to exposures that involved priming words for positive outcomes, as compared to their insecure counterparts, and that insecure study participants, by contrast, responded more strongly (i.e., quickly) to priming words suggestive of negative outcomes (Mikulincer, 1998; Baldwin, et al., 1993; Baldwin, et al., 1996; Collins and Read, 1990).

Attachment styles confer inter-individual differences in behavioral strategies (e.g., Mikulincer, 1998), and behavioral strategies aim to accomplish certain identifiable goal(s) (Collins and Read, 1994). Consequently, attachment styles relate to diverse interpersonal goals (as well as to a single, subjective, and shared interpersonal goal of enabling individuals to attain a greater sense of *felt security*), differentially (e.g., Bartholomew, et al., 2001). Interpersonal (i.e., trust-related) needs and goals appear to determine how individuals allocate their attentional resources in attachment-relevant situations (Collins & Read, 1994; Mikulincer, 1998; Srull & Wyer, 1986; Swann, 1983), while attention directly impacts upon the formation of memories. Along with strategies (e.g., coping), goals constitute the fundamental elements of attachment styles' "self-systems" that theorists regard as essential to the cognitive basis of interpersonal interactions and self-regulation (Baldwin, 1992; Cantor & Kihlstrom, 1995; Collins & Read, 1994). Importantly, each attachment goal subsumes one or more strategies, and potentially pertains to multiple strategies at any given time (e.g., Collins & Read, 1994). Secure individuals utilize trust primarily as a means of enhancing their intimacies within their close, interpersonal

relationships (Mikulincer & Shaver, 2004; Mikulincer & Nachshon, 1991; Shaver & Hazen, 1993; Collins & Read, 1994). By contrast, the goals of individuals with insecure attachment styles develop as defenses against attachment-related distress (Mikulincer, 1998; Bowlby, 1988). Dismissing or anxious individuals act to fulfill their attachment-related needs by way of minimizing their personal distances from their important attachment figures (Mikulincer & Nachson, 1991; Mikulincer, 1998; Collins & Read, 1994). This defense mechanism's central goal consists of protecting affected individuals against experiences or expressions of their attachment needs, given that doing so theoretically increases feelings of vulnerability, and/or activates otherwise deactivated attachment systems (Mikulincer, Shaver, Cassidy & Berant, 2009). Fearful individuals experience chronically high levels of interpersonal distress, and so they endeavor, in main, to manage their prevalent fears of rejection, while also mitigating their vulnerabilities to external sources of threat (e.g., Bartholomew, et al., 2001; Bartholomew, 1990). Along with dismissing types, they expect to receive no assistance in response to their expressions of need, so they often strive to maximize their personal distances from their secondary attachment figures (e.g., Bartholomew, et al., 2001; Bartholomew, 1991; Mikulincer, 1998; Bowlby, 1988). However, dismissing individuals manifest this behavior to a greater extreme, owing to their relatively higher levels of self-confidence and need for self-reliance. Briefly stated, attachment styles influence the degrees to which individuals deem themselves worthy of care (model of self) and perceive others as trustworthy to provide care (model of others) (Ciechanowski & Katon, 2006), with the contingency that fearful individuals stand to score lowest, or to tie with dismissing individuals for the lowest score, on psychological measures of trust (depending on whether, and how, each measure operationalizes a positive view

of the self—as a either degree of worthiness of care from others or a capacity for self-reliance, or both) and dismissing individuals stand to score lowest on most behavioral measures of trust.

Insecure attachment style goals translate into distinctive strategies for coping with interpersonal distress, and secure patterns of memories/appraisals represent manifestations of applied, constructive coping mechanisms (Mikulincer, 1998). Avoidant individuals cope with distress by suppressing their, otherwise painful, attachment-related thoughts and affects; this includes suppressing their expressions of all of attachment-related needs and/or desires, as a means of precluding their *vulnerabilities* to attachment injuries, distancing themselves from their attachment figures (Bartholomew, 1990), maximizing their own senses of personal control, and dispersing the importance of their attachment relationships and/or transactions across the courses of their lives (e.g., Bowlby, 1988; Shaver & Hazen, 1993; Mikulincer, 1998; Bartholomew, 1990; Bartholomew & Horowitz, 1991). On the other hand, preoccupied individuals tend to cope by “clinging” to their attachment figures, ruminating about perceived threats to their attachment relationships (hypervigilance), catastrophizing as a means of soliciting care from their attachment figures, engaging in care-seeking behaviors directed at their attachment figures, and expressing their needs relentlessly/“over-sharing” (e.g., Bartholomew, et al., 2001; Mikulincer, 1998; Bartholomew & Horowitz, 1991; Bartholomew, 1990; Maunder & Hunter, 2001; Thompson & Ciechanowski, 2002). These behaviors reflect a disquieted sense of trust, or a vitreous kind of confidence in attachment figures’ availabilities, during times of need. Similarly, fearful individuals lack any trust in their abilities to care for themselves, but they lack trust in the availabilities of their secondary attachment figures to an even greater extent than preoccupied types. As in the case of dismissing individuals, fearful individuals cope by frequently avoiding their attachment figures, altogether, and by adopting a passive interpersonal

style, and suppressing their expressions of their attachment-related needs (e.g., Bartholomew, et al., 2001; Bartholomew & Horowitz, 1991; Bartholomew, 1990). These predilections result in a characteristic approach-avoid dynamic, whereby fearful individuals alternate between two strategies: 1) seeking out care from their attachment figures, and 2) jettisoning their relationships with attachment figures prematurely and repeatedly (Waldinger, et al., 2006; Thompson & Ciechanowski, 2002; Bartholomew, 1990; Mikulincer & Shaver, 2007; Ciechanowski, et al., 2002; Maunder & Hunter, 2009). Ciechanowski and Katon (2006) observed these dynamics in a study of type 2 diabetics, which found that fearful and dismissing patients reported experiencing lower levels of trust in their healthcare providers, and inability to collaborate with others in relationships of long-standing durations.

This discussion on attachment style differences in trust (above) attests to the existence of attachment style-specific dispositions to trust, while also conveying some of the dynamics and processes inherent in the mechanisms that underscore trust and attachment style interactions, longitudinally. Extensive data now link attachment styles and trust, and only a relatively small amount of it pertains to their individual or interdependent courses over some duration of time (Roisman & Fraley, 2013). Two separate models perdure for describing the hypothetical effects of social experiences (e.g., trust) on enduring cognitive structures (e.g., attachment styles): A “revisionist” perspective, whereby sequential experiences iteratively weaken the long-term associations between an attachment style and trust; and an “enduring effects” model, which maintains that early developmental experiences’ effects are preserved across time, and related to each subsequent trust experience (Roisman & Fraley, 2013). Upon denoting this distinction, Roiser and Fraley remarked that it points to “a vast, uncharted territory in developmental science” (Roiseman & Fraley, 2013). Significant tensions converge on the relative theoretical

(and practicable) volatilities of attachment styles and trust dispositions, but attachment theory research in health and medicine essentially circumvents these tensions by assuming absolute, or near absolute, stability as inherent in adults' attachment styles. Another perspective understands attachment styles as simultaneously subservient to trust, whereby efforts to enhance trust within patient-provider relationships hold the potential to improve attachment style security.

b. The etiological linkages between trust dispositions and attachment styles

“[I]ssues of trust have their origins in the dialectic between people’s hopes and fears as close relationships develop.”

(Holmes & Rempel, 1989)

Trust and attachment style develop connately during infancy, and synergistically across the course the lifespan (Rotenberg, 2010; Pistole, 1993). Each of the two phenomena derive from interactions that take place between infants and their earliest caregivers, and both of them reflect individuals' experiences of maternal sensitivity in response to their expressions of felt needs (Pistole, 1993; Erikson, 1968; Rotenberg, 2010; Armsden & Greenberg, 1987; Bridges, 2003; Mechanic & Schlessinger, 1996). Trust experiences theoretically bend towards trust-related beliefs, which eventually consolidate to form dispositions to trust, through a process analogous to that which abets the calcifications of attachment style working models early in life (e.g., Holmes & Rempel, 1989). Yet, some uncertainty remains as to the extent of stabilities of trust dispositions, relative to those of attachment styles, such that prevalent questions turn on whether or how the two types of dispositions affect one another over time.

Attachment theory presupposes that individuals' working models incorporate their experiences of trust in one interaction after another, across the first several months or years of

their lives, and that these experiences subsequently congeal to form of trust-related beliefs, which further consolidate to manifest as dispositions to trust (Bartholomew, 1990; Holmes & Rempel, 1989). Such a view colludes with a social learning theory perspective of trust, under which individuals' context-specific expectations for trust depend on their prior experiences in similar situations (e.g., Erickson, 1968; Bartholomew & Horowitz, 1991; Ainsworth, Blehar, Waters & Wall, 1978; Mikulincer, 1998; Coble, Gantt & Mallinckrodt, 1996; Erickson, 1963; Collins & Read, 1994; Brewer, 1988; Devine, 1989; Markus, 1977; Markus & Sentis, 1982; Dykas & Cassidy, 2011). Trust expectancies and experiences intersect with one another, by turns, and the emergent patterns fold in on themselves to systemize feedback loops, whereby trust expectations beget novel experiences of trust, and wherein cumulative trust experiences proceed to confirm or disconfirm individuals' progenetorial trust expectancies (Fraley, Hudson, Heffernan & Segal, 2015; Holmes, 1981; Holmes & Rempel, 1989; Fraley, Garner & Shaver, 2000). The process constitutes the basis of many researchers' assumptions regarding the existence of dispositions to trust, throughout attachment theory, health, and medical research. While a comprehensive overview of trust-related expectancies falls outside the scope of this thesis, a limited exploration of some associated research—primarily situated within the field of trust theory—reveals a number of consequential linkages as arising between trust dispositions and attachment style constructs.

Numerous definitions of trust coincide with attachment theory in constructs such as trustee dependability, trustee predictability, personal control, trustor dependence, faith in the future of the relationship, and willingness to accept vulnerability (e.g., Rempel, Holmes, & Zanna, 1985; Mikulincer, 1998; Shaver & Haven, 1993; Mikulincer, 2004; Deutsch, 1973; Rotter, 1980; Scanzoni, 1979; Mayer, et al., 1995; Hall, et al., 2001; Romano, 2003; Lee & Lin,

2008; Müller, Zill, Dirmaier, Härter, & Scholl, 2014). The hindmost concept appears in a definition of trust widely cited throughout healthcare research (i.e., Mayer, et al., 1995). Several authors rendered trust as “the willingness to be vulnerable to the actions of another party, based on the expectation that the other party will perform a particular action important to the trustor, irrespective to the ability to monitor or control that other party” (e.g., Hall, et al., 2001; Hall, Camacho, et al., 2002; Mayer, et al., 1995; Hillen, de Haes, & Smets, 2010; Muller, Zill, Harter, & Scholl, 2014). In a recent literature review on trust, Lewicki & Brinsfield (2012) held that the majority of trust theorists appeared to incorporate “the willingness to accept vulnerability” element into their definitions of trust (e.g., Rousseau, Sitkin, Burt, & Camerer, 1998; Mayer, et al., 1995; Gillespie, 2003; Hillen, de Haes, & Smets, 2011; Lee & Lin, 2008; Müller, et al., 2014). Meanwhile, an unwillingness to accept vulnerability constitutes a defining feature of the dismissing attachment style, and attachment theorists portray preoccupied types as, altogether, too enthusiastic about embracing their vulnerabilities (Bartholomew & Horowitz, 1991; Bartholomew, 1990). Upon reviewing many definitions for interpersonal trust, Rempel, Holmes, & Zanna (1995) concluded maintaining trust involves three separate components, all of which appear critical to attachment style developments: a) appraising one’s partners as reliable and predictable; b) perceiving one’s partners as concerned for one’s needs, and as available; and c) maintaining confidence in the strength of relationships that one holds with their partners. Elsewhere, Holmes and Rempel (1989) proposed that individuals with uncertainty as to whether they can trust their relationship partners likely maintain higher degrees of sensitivity to cues of possible rejection or acceptance, and they equated the development of trust with a process of uncertainty reduction (Holmes & Rempel, 1989; Campbell, Simpson, Boldry, & Rubin, 2010). As previously discussed in this thesis, attachment styles reflect early experiences of certainty or

uncertainty about the degrees to which individuals can depend on the availabilities of their care providers, and insecure attachment relates to both increased uncertainty about providers' availabilities and more acute sensitivities to rejection (that manifest in various forms). Insecurely attached individuals demonstrate less trust in others, overall, than securely attached individuals (Klest & Philippon, 2015), and one qualitative study showed that fearful or dismissing patients with type 2 diabetes reported lower trust in their care providers (Ciechanowski & Katon, 2006).

People store and retrieve social information in different ways, and interpret it according to differing expectancies prescribed by their internal working models, with varying degrees of cognitive flexibility. Research veritably shows that both trust and attachment style discontinuities occur alongside the vicissitudes of time, but it falls short of evincing whether, how, and under what conditions the two phenomena influence one another. In one study, investigators found that secure participants deigned to maintain their levels of trust over time, while participants of an insecure ilk tended to deteriorate in their magnitudes of trust (Collins & Read, 1990). Trust dispositions appear to converge with attachment styles at the point subsuming trust-related expectations. Studies show that trusting relationships often lend themselves to increased dispensations towards attachment style security (e.g., Larzerele & Huston, 1980; Mikulincer, 1998; Kahn & Kram, 1994; Rothbard & Shaver, 1994; Hazen & Shaver, 1990; Brennan & Shaver, 1995; Feeney & Noller, 1990; Hazen & Shaver, 1987; Levy & Davis, 1988; Simpson, 1990), and that trust betrayals or failures potentially transform secure attachment orientations into ones with anxious-ambivalent complexions (e.g., Morrison & Robinson, 1997; Robinson, 1996; O'Neill & Lenn, 1995; McAllister, 1997).

A dynamic view of trust and attachment fully recognizes the benefits that trust begets for individuals, in terms of their well-beings, but also considers trust's limitations and negative repercussions (refer to subpart 3. of this subsection for some discussion on the latter point). The ossifications of attachment styles and dispositions to trust (to the extent that they occur) serve several attachment-related purposes that include promoting individuals' abilities to: 1) maintain substantial trust in their secondary attachment figures in the face of significant threats; 2) cope effectively, and quickly, with threats (e.g., Mikulincer & Shaver, 1994; Mikulincer & Nachson, 1991; Hazen & Shaver, 1991; Holmes & Rempel, 1989); 3) reduce their uncertainties about the trustworthiness of their attachment figures (e.g., their doubts about others' dependabilities, reliabilities, honesty, and the benevolence of their intentions) (Shaver & Hazen, 1993; Baldwin, Fehr, Keedian, Seidel & Thompson, 1993; Holmes & Rempel, 1989; Altman & Taylor, 1973; Hazen & Shaver, 1990; Hardy & Barkham, 1994; Rotenberg, 2010; Dunn & Schweitzer, 2005); 4) develop and maintain their important long-term relationships with powerful others (e.g., Mikulincer & Shaver, 2004; Mikulincer & Nachson, 1991; Shaver & Hazen, 1993); 5) formulate, and act on, their globalized senses of interpersonal trust within their interactions with unfamiliar attachment figures of interest (e.g., Collins & Read, 1990; Mikulincer, 2004); 6) increase their personal senses of self-efficacy (e.g., Mikulincer, 2004; Holmes & Rempel, 1989); 7) maintain their securities in their attachment orientations (among those with preliminarily secure attachment style patterns) (e.g., Holmes & Rempel, 1989); 8) predict the most likely behaviors of other people (Dykas & Cassidy, 2011); 9) accommodate a deepening of their trust in particular interpersonal relationships; 10) reduce their needs for interpersonal monitoring and controls (Ouchi, 1979; Pennings & Woiceshyng, 1987; McAllister, 1997) and 11) attain, or work towards, greater attachment style security. The findings reviewed in this subpart adumbrate a

scenario in which attachment styles continuously entwine and uncoil with dispositions to trust, through elegant processes that enable individuals to deepen and extend their close relationships over long periods of time (e.g., Holmes & Rempel, 1989). Trust dispositions change, but at the same time, the low volatilities of attachment styles apply forceful resistance to change via several mechanisms that favor stability. This renders it likely that individual attachment styles correspond, in at least some measure, to distinctive and recognizable dispositions to trust.

Experts in social psychology robustly contend that social perceptions (e.g., trust expectations) tend to conform to pre-existing cognitive schemas (e.g., working models), based on integrated networks of accumulated memories (Collins & Read, 1994; Cohen, 1981; Erdelyi & Applebaum, 1973; Markus, 1977; Roskos-Ewoldsen & Fazio, 1992; Dykas & Cassidy, 2011; Lee & See, 2004; Fraley & Shaver, 2000; Fraley, 1999; Holmes, 2002). Empirical research demonstrates that top-down, theory-driven processes heavily influence social perceptions, so that existing goals, schemas, and expectations extensively shape the ways in which people view new information (Brewer, 1988; Devine, 1989; Higgins, King, & Mavin, 1982; Markus, 1977; Collins & Read, 1994). Working models presumably assimilate new relational information, even at the cost of distorting it, as opposed to accommodating information that appears at odds with existing expectations (Fraley & Shaver, 2000; Bowlby, 1979; Collins & Read, 1994). Likewise, some attachment theorists suppose that attachment styles endure to act as specific prototypes of attachment relationships, to guide individuals in their future interactions with secondary attachment figures (Bartholomew, 1990). Some research links insecure attachment styles to greater difficulties with integrating new information into existing cognitive structures, relative to secure attachment styles (Mikulincer, 1997; Green-Hennessy & Reis, 1998; Dykas & Cassidy, 2011). Multiple mechanisms pertaining to attachment styles and, to some extent, trust

dispositions engender these dynamics. They include consolidation, selective affiliation, and defensive exclusion.

(i) Consolidation

Both dispositions to trust and attachment style appear to increase in their stabilities as a function of time. Repeated reinforcements of internal working models and trust-related dispositions accrue in the form of connate experiences and retrievals of associated memories, which both inculcate individuals' global mental representations of attachment and trust across a variety of relationships, by way of a gradual calcification of the associated neurological pathways and/or cognitive structures (i.e., "associative memory networks") (e.g., Mikulincer & Shaver, 2007; Shaver, Collins & Clark, 1996; Collins & Read, 1994; Belsky, Spritz & Crnic, 1996; Rieder & Cicchetti, 1989; Maunder & Hunter, 2001; Dykas & Cassidy, 2011). In adulthood, such generic models of attachment figure relationships compose the most chronically accessible representations of individuals' interactions with their important attachment figures (Mikulincer & Shaver, 2007). Some researchers refer to this gradual sublimation of trust dispositions and attachment style orientations to the level of unconscious associations as *the consolidation of individuals' "implicit working knowledge"* (e.g., Mikulincer & Shaver, 2007; Bowlby, 1973; Waters, et al., 2000; Collins & Read, 1994; Main, et al., 1985; Groh, Roisman, Booth-LaForce, Fraley, Owen, Cox, & Burchinal, 2014). The process functions to allow individuals to access the knowledge that they stored in their internal working models automatically (i.e., without the effort required to generate conscious thoughts), and without hesitation, but it transpires at the cost cognitive flexibility (Mikulincer & Shaver, 2007; Collins & Read, 1994; Dykas & Cassidy, 2011). The transmutation to a more stable cognitive structure renders working models substantially resistant to further changes or revisions (e.g., Mikulincer &

Shaver, 2007; Bowlby, 1973; Waters, et al., 2000; Collins & Read, 1994; Main, et al., 1985). Attachment theorists regard this mechanism (i.e., consolidation) as the most important psychological process accounting for attachment styles' enduring stabilities (Mikulincer & Shaver, 2007; Bowlby, 1973; Waters, et al., 2000); it continues for a period of time that, ostensibly, extends into individuals' early childhood years or later (Bowlby, 1969; Bowlby, 1982; Groh, et al., 2014). Relevant trust experiences, therefore, cogently affect individuals' primary attachment styles throughout the durations of their childhood years (Groh, Roisman, Booth-LaForce, Fraley, Owen, Cox, & Burchinal, 2014; Bowlby, 1969; Bowlby, 1982). With respect to dispositions to trust, a similar process occurs (e.g., Pistole, 1993; Erikson, 1968; Rotenberg, 2010; Armsden & Greenberg, 1987; Bridges, 2003; Waters, Vaughn, Posada, and Kondo-Ikemura, 1995; Mechanic & Schlessinger, 1996), but it results in the retention of relatively greater flexibility that facilitates a higher degree of mutability over time. Where attachment theorists embrace and endorse stability, contemporary trust theorists forcefully reject the notion that trust dispositions abide as static demesne—"an edifice that, once erected, simply continues to provide a warm place to house . . . [future] relationship[s]" (Holmes & Rempel, 1989).

(ii) Selective affiliation

In addition to consolidation, social psychologists implicate a second mechanism involved in advancing attachment styles' stabilities: selective affiliation, which involves continually advantaging implicit procedural memories (Bartholomew & Horowitz, 1991; Bartholomew, 1990; Bowlby, 1969; Bowlby, 1973; Bowlby, 1980; Rotenberg, 2010; Collins & Read, 1994; Main, et al., 1985; Scharfe & Bartholomew, 1994; Fronstin, Greenberg, & Robins, 2005; Davis & Kirkpatrick, 1991; Sroufe & Fleeson, 1986). The perception of working models as prototypes

or “templates” of attachment figure relationships comprises one common representation of the mechanisms that facilitate attachment styles’ stabilities, but another view considers the notion that attachment styles, once established, actively perpetuate themselves (Fraley, Vicary, Brumbaugh, & Roisman, 2011; Main, et al., 1995; Mikulincer, 1998; Bartholomew, et al., 2001). This latter conceptualization construes individuals as active participants in the constructions of their own working models, as opposed to passive recipients of outcomes transmitted entirely by early interactions with parents and/or other primary caregivers (Fraley, et al., 2011; Main, Kaplan & Cassidy, 1985; Mikulincer, 1998; Fiske & Taylor, 1991; Collins & Read, 1994). Bowlby argued that working models consist of more than just directly internalized experiences; they, additionally, contain regulatory rules that bias individuals’ appraisals of themselves, and others, defensively (Bowlby, 1988; Shaver & Mikulincer, 2002). The dynamic champions a mechanism that not only favors stability, but also assents to change.

Selective affiliation refers to well-established tendencies, that most people manifest, to seek out confirmatory/avoid disconfirmatory social contexts, and to select certain social partners based on preferences for self-confirmatory feedback (Bartholomew, 1990; Bartholomew, 1991; Caspi & Elder, 1998; Bartholomew, et al., 2001; Bartholomew, 1997). As an example, attachment theory predicts that attachment styles affect the qualities of adults’ marriages, by way of their effects on individuals’ romantic partner selections (e.g., Hudson & Fraley, 2014; Bartholomew, 1990; Bartholomew & Horowitz, 1991; Hazen & Shaver, 1987). The similarity-attraction theory of social psychology concurs, positing that people with similar personality characteristics seek out relationships with one another (Montoya, Horton, & Kirchner, 2008; Lee & See, 2004; Hudson & Fraley, 2014; Tidwell, Eastwick & Finkel, 2013); studies show that people often describe their ideal partner as someone with personality characteristics, altogether,

similar to their own (Botwin, Buss, & Shackelford, 1997; Markey & Markey, 2007; Hudson & Fraley, 2014). Additionally, Rholes, et al. found that avoidant individuals applied more information-processing strategies that suppressed attachment relevant information about their partners, and preferred to seek out nonintimate relationship information, while anxiously attached study participants showed a higher likelihood of seeking out negative information about their own relationship behaviors and characteristics (Rholes, Simpson, Tran, Martin, & Friedman, 2007; Dykas & Cassidy, 2011). By contrast, secure individuals process attachment-relevant social information relatively fully and flexibly (Dykas & Cassidy, 2011).

Selective affiliation research shows that people respond to social feedback in a way that evokes specific reactions from their relationship partners, which serve to confirm the essential components of their already pre-existing mental models of interpersonal relationships (Holmes & Rempel, 1989; Kelly & Stahelski, 1970; Miller & Holmes, 1975; Bartholomew, et al., 2001). Such a dynamic materialized in one study, where researchers found that individuals who anticipated rejection within their intimate relationships comported themselves in a manner (during relationship conflicts) that elicited the very same rejecting behaviors from their partners, which they feared to invoke from the outset (Downey, Freitas, Michaelis & Khouri, 1998; Bartholomew, et al., 2001). Additional studies presented similar findings, wherein participants who distrusted the motives of others tended to provoke reactions that conformed to those they most feared to provoke (Holmes & Rempel, 1989; Kelly & Stahleski, 1970; Miller & Holmes, 1975). These two inclinations (e.g., seeking out self-confirmatory feedback and eliciting confirmatory responses from relationship partners) operate in tandem to form a positive, mutually reinforcing feedback loop that perpetuates existing attachment style orientations.

Studies indicate that people pursue or avoid social contacts differentially based on their attachment styles. Relationships challenge individuals, in terms of their capacities for coping with distress, and, therefore, they accord with individuals' particular propensities for taking risks in the context of close, interpersonal relationships (Holmes, 1981; Holmes & Rempel, 1989). Dismissing and fearful individuals regularly avoid contact with their attachment figures, even and especially during times of distress—theoretically as a result of their overwhelming fears of rejection (fearful) and/or their needs for a positive, if fragile, sense of trust that rests on their abilities to maintain some semblance of independence in exigent circumstances (dismissing). Preoccupied types, on the other hand, overtly pursue relationships with their attachment figures, and sustain personalities that many attachment theorists consider as overly-dependent (Bartholomew, 1997; Holmes & Rempel, 1989).

(iii) Defensive exclusion

Selective affiliation affects the ways that individuals receive and interpret external information from other people in their environments, but a separate process implicates internal sources of information bias: defensive exclusion. Defensive exclusion involves selective inattention to cues that elicit attachment cognitions and/or behaviors (e.g., Main, et al., 1985; Dykas & Cassidy, 2011), and it takes on various designations throughout the field of psychology, such as “defensive avoidance” (e.g., Kobak & Sceery, 1988), or “defensive suppression” (e.g., Shaver & Fraley, 2008; Shaver & Mikulincer, 2008). Attachment theorists envisage working models as, basically, knowledge structures that shape and contain interpersonal behaviors, per rules that govern information processing (e.g., Fraley, Garner & Shaver, 2000; Collins & Read, 1994; Main, et al., 1985; George & West, 2003; Bowlby, 1980; Mikulincer, Shaver, Cassidy, & Berandt, 2009; Dykas & Cassidy, 2011). Cognitive processes subject incoming information to

multiple stages of unconscious analysis and synthesis, before it arrives at the level of conscious awareness (Bretherton & Munholland, 2008). Each stage avails to retain information most relevant to individuals' contemporaneous goals, and to discard the less salient details (Bretherton & Munholland, 2008). Some cognitive psychologists connote the process as "selective exclusion" (e.g., Bretherton & Munholland, 2008), but Bowlby utilized the term "defensive exclusion" to encompass a singular type of selective exclusion that accords to the goal of preventing from awareness certain, otherwise unbearable, attachment-related events or verities (Shaver & Mikulincer, 2002; Bretherton & Munholland, 2008; George & West, 2003; Dykas & Cassidy, 2011). Thus, the concept individuates a defense mechanism that qualifies as a specific type selective exclusion (e.g., Bretherton & Munholland, 2008). Like all defense mechanisms, it perdures as an adaptive coping strategy relative to some situations and a maladaptive coping strategy relative to others (e.g., Metzger, 2014; Ein-Dor, Mikulincer, & Shaver, 2011a).

Attachment theory incorporates the concept of defense (Cramer & Kelly, 2010; Mikulincer, Shaver, Cassidy & Berant, 2009; Shaver & Mikulincer, 2002; Shaver & Mikulincer, 2008; Mikulincer, Shaver, Cassidy & Berant, 2008; Fraley, Davis & Shaver, 1998; Fraley, Garner & Shaver, 2000), whereby defense mechanisms contribute to the attachment system's hyperactivation or deactivation (Cramer & Kelly, 2010). Defensive processes represent a prominent feature of Bowlby's discussion about attachment theory, over the course of which the author proposed that these mechanisms follow a model of information processing (George & West, 2003). Different persuasions of attachment insecurity map to different psychological defenses (Mikulincer, Shaver, Cassidy & Berant, 2008; Cramer & Kelly, 2010; George & West, 2003). In the Bowlbian sense, defense refers to defensive exclusion (George & West, 2003), and attachment theory implicates at least three subtypes of the defensive exclusion: 1)

deactivation; 2) cognitive dissociation; and 3) segregated systems, that occur on two differentiable levels: 1) perceptual exclusion, (which results in attachment system deactivation); and 2) preconscious exclusion (the exclusion of encoded attachment information from an conscious awareness) (George & West, 2003; Bowlby, 1980). Defensive exclusion appears as a major concept in attachment theory (George & West, 2003), yet little contemporary research actively focuses on it (e.g., George & West, 2003).

In interview-based research (i.e., using the AAI procedure), attachment style security produces interviewee discourse of a style that investigators refer to as “coherent” (George & West, 2003), while incoherent styles of discourse emanate from attachment insecurity (Dykas & Cassidy, 2011). The latter style of discourse presents as riddled by blockages, interruptions, interferences, and/or distortions (George & West, 2003; Main, 1995), owing to defensive processes that disallow some attachment information to enter into interviewees’ conscious awarenesses (George & West, 2003; Dykas & Cassidy, 2011). Insecure people organize attachment-related information according to rules determined by their internal working models, but secure individuals process such information relatively fully and flexibly (e.g., Dykas & Cassidy, 2011; Kirsh & Cassidy, 1997; Main, 1999; Mikulincer & Shaver, 2002). Studies also show that adults often attend to threatening social information in a schematically biased manner (Dykas & Cassidy, 2011). According to some research, anxious individuals cultivate heightened levels of attention to attachment information (particularly to negative attachment information), while avoidant individuals display deficits in terms of their attentions to attachment information, but not towards non-attachment-related information (Dykas & Cassidy, 2011). This latter finding suggests avoidant individuals harbor memory deficits specific to attachment information, rather than global memory deficits. Consistent with these findings, Fraley and Brumbaugh

(2007) reported that avoidant study participants experienced the greatest degree of difficulty with remembering information, even when provided with a monetary incentive for remembering, and other data linked a more insecure attachment style to poorer attention for emotionally significant information (Fraley, Garner, & Shaver, 2000), as well as to greater difficulties with integrating new information into existing cognitive structures (Mikulincer, 1997; Dykas & Cassidy, 2011).

In AAI interviews, defensive exclusion appeared in the form of cognitive dissonance, when researchers encountered inconsistencies between the expressed quality of participants' relationships and the natures of their experiences. For example, adults labeled as dismissing reported positive global evaluations of their parents, but they relied primarily on negative experiences of their parental interactions (Collins & Read, 1994; Dykas & Cassidy, 2011). At the same time, preoccupied individuals showed tendencies to oscillate between positive and negative reports regarding their parents, and to report marked levels of confusion about the timbres of their parental relationships (Collins & Read, 1994). In short, for all conditions of insecure attachment, the attachment system excluded the normal operations of memory and attention (George & West, 2003; Main, et al., 1985), but instead effectuated outcomes that accorded to certain rules for restricting affected individuals' attentions, and behaviors, in the contexts of their close relationships.

(iv) Additional dynamics involved in trust/attachment style interactions

Numerous examples of mechanisms that play a role in driving attachment and trust-related processes dot the landscape of attachment theory research. The previous subparts of this subsection merely touched on a few of the most important/widely discussed mechanisms, while this current subpart of the thesis briefly acknowledges the theoretical (and empirical)

subsistences of some others. A complete accounting of the processes and dynamics of trust and attachment theory falls outside the scope of this current thesis.

Different attachment styles yield different types of defensive mental strategies for processing social information, with each strategy contributing to affected individuals' distinctively biased memory patterns (Dykas, et al., 2014). Defensive exclusion characterizes the dismissing attachment style in particular, although it manifests in specific ways within the other three attachment styles (e.g., Dykas, et al., 2014). Beyond defensive exclusion, however, other defensive maneuvers assist individuals in coping with potentially threatening information. *Defensive projection* involves the projections of individuals' self traits onto others, for the sake of excluding negative information about the self and maintaining interpersonal distances (Shaver & Mikulincer, 2002). Additionally, *defensive identification* involves joining with, or emulating a threatening individual, to achieve connectedness in the face of the attachment-related threat of separation (Shaver & Mikulincer, 2002). Defensive projection pertains predominantly to dismissing individuals, while defensive identification remains a strategy primarily employed by preoccupied types (Mikulincer & Shaver, 2002).

Self-efficacy plays a crucial role in determining whether individuals maintain adequate self-esteem, and emotional balance, for resolving life difficulties in the face of personal failures (Mikulincer & Shaver, 2008). Low self-efficacy (insecure persons) results in sparse problem-solving behaviors, such that affected individuals fail to eventually develop constructive coping strategies (Mikulincer & Shaver, 2008). This scenario relates to a mechanism called *defensive self-handicapping*, whereby some individuals emphasize factors that impair their performances, in efforts to protect themselves against damage to their fragile self-esteems (Mikulincer & Shaver, 2008). Another defense mechanism that dismissing individuals tend to engage, called

self-inflation, involves accentuating one's differences with other people (e.g., interpersonal distancing) as a means of maintaining a sense of superiority. This serves to prop up their beliefs that they enjoy the capacity to cope effectively without any assistance from other people (Mikulincer & Shaver, 2008; Shaver & Mikulincer, 2002). These mechanisms, like those in the antecedent subparts of this thesis, purportedly act on individuals to maintain attachment styles and dispositions to trust over time, while allowing for the possibility of change.

Attachment styles beget dispositions to trust, but research suggests that trust dispositions also influence attachment styles. In the course of a review on extant attachment theory research, Bartholomew (1990) cited evidence of conditions that predict selective affiliation from studies of children (e.g., Main & Weston, 1981; Waters, Wippman, & Sroufe, 1979; Sroufe, 1983; Sroufe, Fox, & Pancake, 1983; George & Main, 1979). Researchers reported that securely attached infants displayed greater willingness to engage with unknown, friendly strangers, as compared to insecure participants, and that secure infants exhibited higher levels of affective sharing across their social interactions, while also sustaining higher scores on a measure of their peer-related competencies (administered at age 3 ½) (Bartholomew, 1990; Main & Weston, 1981; Waters, et al., 1979). Moreover, securely attached infants enjoyed more mutually fulfilling peer relationships, greater degrees of popularity, and more positive affect/lower negative affect in the courses of their social interactions, relative to experiences of avoidant infants (identified as such at the time of birth), who manifested more unprovoked and aggressive outbursts towards their caregivers (i.e., daycare workers), and greater tendencies to shun their caregivers (Bartholomew, 1990; Sroufe, 1983; George & Main, 1979). Avoidant children's pre-school teachers tended to describe the subjects using terms akin to "emotionally distant" or "withdrawn", or alternatively, "hostile" or "aggressive" (Bartholomew, 1990; Sroufe, 1983). All of these tendencies,

behaviors, and capacities allude to trust dispositions that likely attracted or repelled others, amid children whose primary attachment styles remained in flux. They presumably impelled trust experiences that contributed to trust expectancies, which the childrens' primary attachment styles later subsumed through the process of selective affiliation. Consistent with this interpretation of the evidence, Bartholomew remarked in the same article that "the social behavior of children is often . . . suggest[ive of] a deep distrust in others and a failure to conform to social norms of reciprocity . . . [--A] pattern which is particularly self-defeating because it not only undermines the friendly approaches of others, it also leads to social rejection that confirms the child's distrust" (Bartholomew, 1990). Thus, attachment styles plausibly bend to trust dispositions at certain points in their developments (at least during childhood). While evidence supports the hypothesis that attachment styles possibly affect health-related outcomes through their determinations of individuals' dispositions to trust, it also calls for optimism. To the extent that a dialogue continues across the life course, between interpersonal trust and attachment styles, interventions that aim to improve patients' trust in their providers stand to proffer personal growth towards greater admeasurements of attachment style security.

c. The fallout of trust

A majority of the literature on trust presumes that trust subsists as inherently good, such that greater quantities of it always produce more beneficial outcomes (McAllister, 1997). However, some theorists point to the existence of a "dark side of interpersonal trust" (e.g., McAllister, 1997; Welch, et al., 2005). Trust relationships serve many constructive purposes (enumerated in the previous subsection), but they simultaneously expose people to risks of betrayal under conditions that augur against the detection of deception (McAllister, 1997; Welch, et al., 2005). Shapiro (1990) remarked that "because trust norms . . . disarm the protections that

wary principles would otherwise erect around social and economic exchange, they increase abuse of fiduciary duty relationships at the same time that they make these relationships possible. Several authors argued that high trust often unwittingly generates a kind of “blindness” that allows trustees to exploit or take advantage of trustors (Lewicki, et al., 2006; Elangovan & Shapiro, 1998; Kramer, 1996; Wicks, Berman, & Jones, 1999). They indicate that a certain amount of “prudent paranoia” appears appropriate within interpersonal relationships (Kramer, 1996; Lewicki, et al., 2006; Welch, et al., 2005).

Trust requires a prediction about the future and, thus, some balance between accruing risk and engaging in protective behaviors (Mechanic, 2000; Rolfe, Cash-Gibson, Car, Sheikh, & McKinstry, 2014). In the context of healthcare, “blind” trust potentially contributes to physicians shirking their responsibilities, and decreased preferences, among patients, for active participation in their treatments (Hillen, et al. 2011; Lee & Lin, 2011). For example, blind trust cogently deters patients from asking questions, but asking questions often assists practitioners in clarifying the details of patients’ treatment plans (Lee & Lin, 2011). Freburger, et al., reported a negative association between some patients’ trust in their physicians, and “medical skepticism”—a construct that measures participants’ doubts about conventional medical care to appreciably alter their health statuses (Freburg, Callahan, Currey, & Anderson, 2003), but asking for a second opinion in high-risk medical scenarios constitutes a prudent and protective health behavior (Rolfe, et al., 2014). In addition to their potential effects on health, negative experiences of trust impede individuals’ functioning, impair their self-concepts, and reduce their capacities for trusting other people in the future (McAllister, 1997). Research suggests that the negative consequences of trust betrayals prove extreme and long-lasting (McAllister, 1997; Barber, 1983). To the extent that trusting relationships leave individuals open to failures and

betrayals, a singular emphasis on the efficiencies of trust threatens to instigate more harms than benefits. Some evidence, indeed, shows that individuals with higher levels of trust demonstrate increased gullibility and susceptibility to betrayal (Rotter, 1980; McAllister, 1997).

Interpersonal trust turns on confidence in the predictability, reliability, and benevolence of others (McAllister, 1997; Hazen & Shaver, 1990; Rothbard & Shaver, 1994), which links a foundational element of attachment style to trust. Researchers found that individuals with low self-esteem and preoccupied attachment styles more often place themselves in situations that involve trust, prematurely place their confidences in others, and/or utilize tactics that serve to rationalize betrayals of trust, as compared to individuals with other attachment styles (McAllister, 1997). The intense desire for proximity to attachment figures that individuates preoccupied types likely acts as a strong incentive to perpetuate trust relationships and defend assumptions of others' trustworthiness under conditions where others would abandon such relationships and/or assumptions (McAllister, 1997). Studies also suggest that preoccupied persons develop more unhealthy relationships, vis-à-vis trust, that encompass greater dependency on others, and stronger incentives to defend their assumptions of other peoples' trustworthiness (Hazen & Shaver, 1990; Shaver & Hazen, 1994; Feeney & Noller, 1990; Hardy & Barkham, 1994; McAllister, 1997). In McAllister's estimation, effective trust relationships characterize individuals with secure attachment styles, where *effective trusting* involves *effective distrusting*, and provide the foundations for productive exploration and learning, as well as broader affiliation (McAllister, 1997).

Stepping back from a paradigm that demands "blind trust" on the part of the patient creates a space within which to encourage, and consider the benefits of, mutual trust (Brennan, et al., 2013; Calnan & Rowe, 2008). Some researchers argue that reciprocal trust (between patients

and providers) appears important for achieving effective patient-provider relationships and positive healthcare outcomes (Brennen, et al., 2013; Cook, Kramer, Thom, & Cooper, 2004). The extent to which providers demonstrably trust their patients cogently affects the manners in which these patients perceive the qualities of their relationships with their healthcare providers, in ways that potentially impact certain factors determinative of their health outcomes, such as patients' willingness to disclose important information and/or adhere to their treatments' protocols (Brennan, et al., 2013). Notwithstanding this, mutual trust arguably concords with the current (and increasing) emphasis of diabetes care on collaborative decision-making and increased patient involvement (e.g., ADA, 2016). Additionally, leading trust theorists (e.g., Holmes and Rempel) view mutual trust as important to the growth and maintenance of interpersonal relationships over time (Holmes and Rempel, 1989). Holmes and Rempel (1989) predicted that "[a] shared sense of confidence in dealing with problems may become more central to trust as time passes." Placing trust in the patient signals a volition to relinquish some control over the situation and this, in turn, likely serves to quiet patients' concerns over control (e.g., Holmes & Rempel, 1989). In dismissing patients, for whom matters of control take on the utmost importance, demonstrations of trust by providers, therefore, conceivably emerge as key components of any clinical intervention that aims to improve relationships between dismissing patients and their healthcare providers.

The unidimensional model of trust (refer to subpart 2.V.C.ii) lends itself to an understanding of trust wherein trust relations tend towards either stable, reciprocated trust or stable, reciprocated distrust. Recognizing the importance of stable intermediate levels of trust draws in the bi-directional model of trust (also discussed in subpart ii. of this subsection on the patient-provider relationship), which allows trust and distrust to coexist contemporaneously. The

current thesis conducts a secondary analysis of data collected in connection with another study, and is limited by the measure of trust that the researchers from the primary study included in their questionnaire—a measure that lacks provisions for construing trust in concordance with a bi-directional model. Moreover, little research exists on intermediary trust dispositions (McAllister, 1997). Therefore, this study evaluates the relationship between attachment style dismissingness and trust as a binary construct (present or absent). Future research regarding the patient-provider relationship as a potential mediator between attachment style and diabetes health should consider incorporating a bi-directional measure of trust.

To date, little research explicitly evaluates the relationship between trust in the healthcare provider and attachment style. In addition to the qualitative study undertaken by Ciechanowski and Katon (2006), one quantitative study reported an association between lower levels of trust in the medical profession and a fearful attachment style (Klest & Philippon, 2015). The current study aims to add to this research, and to also interrogate the relationship between trust in the provider and diabetes health. At the same time, this thesis recognizes a need for future research that conceptualizes (if not renders) the trust-attachment relationship as dynamic, and retaining some admeasurement of flexibility. Within such a context, opportunities for interventions aimed at improving patient-provider relationships and/or patients' health outcomes plausibly emerge (e.g., as when this perspective threw a sharp light on the potential for providers to enhance their relationships with dismissing patients by engaging in displays of trust). On the other hand, applying an absolutely static frame of reference, with regards to the trust disposition-attachment style relationship, threatens to promulgate discrimination by providers (refer to the Discussion section of this thesis (i.e., subpart 5.II.) for a further explication of this point).

d. Applications of trust in health and medical research, including studies on attachment theory and/ or type 2 diabetes

The salience of trust varies from context to context, but it appears particularly important in relation to the provision of health care, where uncertainty runs high (Calnan & Rowe, 2006). Additionally, psychiatrists, psychologists, nurses, and other health care providers have long recognized the utility of attachment theory as it relates to the provision of patient care, therapeutic contexts, and therapeutic encounters (Hooper, Tomek, & Newman, 2012; Bifulco, Mahon, Kwon, Moran, & Jacobs, 2003; Brennan & Shaver, 1995; Byng-Hall, 2002; Feeney, 2000; Feeney & Ryan, 1994; Griffin & Bartholomew, 1994; Hooper, 2007; Marotta, 2002). The need for interpersonal trust in health care relates to the vulnerability associated with illness, asymmetrical information availability, and unequal relationships that arise from the specialist nature of scientific/medical knowledge, and—in the U.S., where the links between clinical practice and economic incentives occur as explicit—fiduciary arrangements (Calnan & Rowe, 2004; Calnan & Rowe, 2006; McAllister, 1997; Jones, Carson, Bleich, & Cooper, 2012; Hall, Camacho, Dugan, & Balkrishnan, 2002; Crawley, 2001; Brennan, et al., 2013).

The majority of research on trust in the context of health care takes, as its end, improvements to the patient-provider relationship, as one means of improving patients' health outcomes (e.g., Pistole, 1993; Berrios-Rivera, et al., 2006; Polinski, Kesselheim, Frolkis, Wescott, Coleman, & Fischer, 2014; Müller, et al., 2014; Lee & Lin, 2008; Lee & Lin, 2011; Brennan, Barnes, Calnan, Corrigan, Dieppe, & Entwistle, 2013; Mancuso, 2010; Traylor, Schmittiel, Uratsu, Mangione, & Subramanian, 2010). Consequently, it impels an assumption that interpersonal trust subsists as not fully dictated by individual dispositional attributes or psychological states, but rather that it derives from a set of interpersonal behaviors or some shared sense of identity that, to some

extent, accommodates change (Calnan & Rowe, 2006). Mechanic, 2000 reported that patients viewed trust as an iterative process, and that they commonly tested their doctors' knowledge and expectations, while they believed that trust represented a learnable set of skills, as opposed to set personality characteristics (Rolfe, et al., 2014). Consistent with these findings, Colquitt, Scott, and LePine (2004) conducted a meta-analysis of the trust literature, and found that the levels of trust that participants experienced in their interpersonal relationships incorporated three components: individual dispositions to trust, but also perceived trustworthiness of the trustee, and felt affect towards the trustee (Colquitt, Scott & LePine, 2004). Levels of trust, therefore, depend on attributes of the trustee as well as on attributes of the trustor.

Trust in the provider appears to matter for the managements of both chronic and acute illnesses, including diabetes (Hall, et al., 2001; Rolfe, et al., 2014). It purportedly mediates key attitudes, outcomes, and behaviors related to health (Hall, et al., 2002). For example, some studies show that trust in doctors predicts the frequency with which patients seek care, and their preferences for control in medical decision-making (Rolfe, et al., 2014; Jones, et al., 2012). Lee and Lin (2011) showed evidence of a positive association between trust and glycemic control in type 2 diabetics. Polinski, et al. (2014) found that patients who neglected to fill a prescription for hypertension expressed mistrust of their providers, and that many participants described feeling angry and suspicious about their diagnoses, along with a lack of acceptance of the idea that they needed to take medications. This transpired despite the fact that all participants acknowledged hypertension as a clinically important outcome, due to its attendant increases in risks for strokes and heart attacks (Polinski, et al., 2014). Researchers in the same study found that participants considered the full disclosure of information about their hypertensive drugs' side effects and costs, by their care givers, important to their decisions regarding whether or not to adhere to their

treatment recommendations (Polinski, et al., 2014). Thus, participants' beliefs about their clinicians' trustworthiness likely affected their willingness to take the medications that their providers prescribed.

Several other studies support this link between patients' attitudes (including trust) and their adoptions of physicians' recommended lifestyle modifications or medication regimens (Jones, et al., 2012; Bosworth, Dudley, Olson, Voils, Powers, Goldstein, & Oddone, 2006; Kressin, Wang, Long, Bokhour, Orner, Rothendler, Clark, Reddy, Kozak, Kroupa, & Berlowitz, 2007; Kressin, Ornder, Manze, Glickman, & Berowitz, 2010; Piette, Heisler, Krein, & Kerr, 2005; Thom, Ribisl, Stewart, & Luke, 1999; Nguyen, LaVeist, Harris, Fatta, Bayless, & Brant, 2009; Lee & Lin, 2009). Other research shows greater likelihoods of committing to primary care relationships and/or greater adherence to medical advice among patients who trusted their primary care providers (Berry, et al., 2008; Ratanowongsa, et al., 2013; Freedman, 2003; Sharf, Stelljes, & Gordon, 2005; Hillen, et al., 2014; Figg, et al., 2010; Thom, et al., 1999; Safran, et al., 1998; Lee & Lin, 2011; Thom, et al., 1999; Trachtenberg, et al., 2005), while significant evidence suggests that poor patient adherence to medical regimens (e.g., failures to keep appointments) negatively affects glycemic control in diabetic individuals (Nicolucci, Carinci, & Ciampi, 1998; Karter, et al., 2004; Jones, et al., 2012; Safran, et al., 2004). Two separate studies uncovered significant associations between patients' trust in their physicians and fewer attempts to lose weight (Jones, et al., 2012) or exercise (Safran, et al., 2004). Lee and Lin (2009) reported that diabetic patients who trusted their physicians enjoyed stronger self-efficacy and health outcome expectations than non-trusting diabetic patients. Another study suggested that they perceived less difficulty in completing their diabetes-related care activities (Bonds, et al., 2004).

A considerable volume of evidence indicates that trust mediates therapeutic processes, and influences health outcomes indirectly through its impacts on patient satisfaction, adherence to treatment, continuity of care with providers, healthcare utilization (refer to subsection II.D.vi., on visit frequency), and information disclosure (Calnan & Rowe, 2004; Vrennan, et al., 2013; Lee & Lin, 2009; Lee & Lin, 2011). Two studies showed that trust in one's physician positively predicted self-reported health status (Kao, Green, Zaslavsky, Koplan, & Cleary, 1998), symptom improvement (Thom, et al., 1999; Thom, Kravitz, Bell, Krupat, & Azari, 2002), and health-related quality of life (Mainous, et al., 2004). Self-disclosure (an indicator of trust, and correlate of certain attachment styles) (Bartholomew, et al., 2001; Pistole, 1993; Ciechanowski & Katon, 2006; Freburger, et al., 2003; Wei, Russell, Malinckrodt, & Vogel, 2007) consociated with indicators of better health, including increased immune function in Pennebaker, et al. (Pennebaker, Kiecolt-Glaser, & Glaser, 1998), and additional evidence denotes that emotional suppression tends to place affected individuals at higher risks of developing physical and psychological disorders (Kotler, Buzwell, Romeo, & Bowland, 1994). These findings also highlight the importance of both attachment styles and trust dispositions for health, given that doctors' abilities to treat illnesses often depends on their patients' willingness to disclose important health information.

At present, a lack of interventions, and longitudinal or experimental studies examining the effects of trust on health outcomes, persists (Rolfe, et al, 2014; Calnan & Rowe, 2004; Hillen, et al., 2011; Lee & Lin, 2011). The authors of a recent review of randomized controlled trials on the effects of trust interventions for improving participants' health outcomes concluded that insufficient evidence existed on which to base a valid meta-analysis of such studies (Rolfe, et al., 2014). In another review of studies on trust in healthcare research, investigators found that

only 41% of such studies considered trust from the outset, while in 59% trust only emerged as a secondary outcome (Brennan, et al., 2013). Only one out of the ten studies that they reviewed provided a specific definition of trust (Rolfe, et al., 2014). Müller, et al. conducted a review of trust in physician scales and concluded that the overall quality of their psychometric properties appears unsatisfactory (Müller, Zill, Dirmaier, Harder, & Sholl, 2014). Similarly, Hall, et al. (2002) found widespread inconsistencies in the ways that health researchers conceptualized trust, and noted that the authors of these measures frequently developed them from relatively small pools of candidate items without any detailed conceptual models, which they tested on specialized or limited populations. Hillen, et al., (2011) reviewed 45 papers about trust in physicians among adult oncology patients or individuals at risk of developing cancer, and reported that researchers in 34 of the studies that they reviewed (16 qualitative studies and 18 quantitative studies) used the term “trust” without any clarification of the concept. Future research requires better measures of trust in the provider, in order to accurately evaluate its associations with health and diabetes outcomes.

e. Findings and formulations: A summation of the evidence from the antecedently reviewed research, as it relates to the hypotheses interrogated by the contemporaneous study on attachment theory and diabetes health

Attachment theory concerns personal development, to the extent that personal development emanates from nascent, determinative experiences that individuals encounter over the course of their “attachments” to significant others. The successful management of type 2 diabetes requires ongoing commitments to one or more of multifold, severally taxing, regimens that stipulate necessary behaviors in the arenas of diet, exercise, glucose monitoring, footcare, and/or medication adherence, along with continual procurements of medical care (ADA, 2012a;

Ciechanowski, et al., 2001; Thompson & Ciechanowski, 2002; ADA, 2015). Congruently, attachment theory research conducted in populations of individuals with diabetes reveal that certain attachment styles—especially the dismissing attachment style subtype—consistently concatenate with worse diabetes health outcomes (e.g. higher HbA1c, poor adjustment to diabetes, poor adherence to glucose monitoring, medication, diet, exercise, and footcare regimens, higher rates of death, tobacco smoking, and night-eating) (e.g., Ciechanowski, et al., 2001; Turan, et al., 2003; Ciechanowski, et al., 2010; Morse, et al., 2006; Ciechanowski, 2004; Ciechanowski, et al., 2003).

Attachment theorists and attachment theory researchers argue that individuals frequently manifest traits or behaviors consistent with multiple attachment styles, and that they may be characterized by the varying degrees of each attachment style contributing to their respective pattern of relating to others (Ciechanowski, et al., 2004; Ciechanowski, et al., 2003; Griffin & Bartholomew, 1994; Dutton, et al., 1992). Viewed differently, individual attachment styles may be construed in terms of the extents to which a particular attachment style contributes to their overall make-up, and/or they resemble the prototype associated with particular attachment style. This study, accordantly, explores the nature of a relationship between attachment style status, in the configuration of “attachment style dismissingness”, and diabetes health in terms of its most important intermediate indicator (HbA1c level), by way of interrogating the effects of three potential mediators in the pathway: maladaptive coping behaviors (as evinced by cigarette smoking behaviors), the frequency of visits to a primary care provider, and trust in the primary healthcare provider.

f. Study purpose, research questions, specific aims, and hypotheses

The primary purpose of this study is to build on existing research about applications of attachment theory to the goal of optimizing diabetes health in a primary healthcare setting, through the exploration of a relationship between attachment style (conveyed in terms of “dismissingness”) and diabetes health (i.e., HbA1c), along with three potential mediators in this pathway (formulated on the basis of evidence from prior studies about attachment style and diabetes, and evaluated in this study), using data from a cross-sectional sample of ambulatory patients with type 2 diabetes who sought care at The Harborview Medical Center in Seattle, Washington. A secondary purpose consists of informing public health research and public health practices, as they pertain to studies and interventions that integrate attachment theory principles, and apply to the context of preventing or mitigating chronic diseases (especially diabetes).

The seven hypotheses appraised in the study encompassed by this thesis (specified by the information reported in tables 1 and 2, that describe the variables used in this study’s analyses and summarize the hypotheses tested, respectively) which follow from two broad research questions that give rise to four specific aims: 1) Do maladaptive coping behaviors function as potential mediators in pathways between more dismissing attachment styles and relatively poorer diabetes health outcomes (consistent with prior research) in individuals diagnosed with type 2 diabetes?; and 2) Does the patient-provider relationship function as a potential mediator in pathways between more dismissing attachment styles and relatively poorer diabetes health outcomes in individuals diagnosed with type 2 diabetes? The specific aims of this study relate to the manners in which its associated measures operationalize the two over-arching subtypes of its hypothesized mediators—maladaptive coping behaviors and the patient-provider relationship. Specifically, this study aims to assess whether 1) higher levels of attachment style

dismissingness consociate with worse diabetes health statuses (i.e., higher levels of mean HbA1c); 2) cigarette smoking, as a particular type of maladaptive coping behavior, mediates any observed association emerging between attachment style dismissingness and diabetes health status (i.e., mean HbA1c); 3) the frequencies of patients' visits to primary care providers mediate any association emerging between attachment style dismissingness and diabetes health; and 4) trust in the primary healthcare provider (an indicator of both maladaptive coping behaviors and the patient-provider relationship) mediates any association that emerges between attachment style dismissingness and diabetes health status(i.e., mean HbA1c).. These specific aims further decompose into seven definitive hypotheses that, collectively, predict associations between 1) higher levels of attachment style dismissingness and higher mean HbA1c; 2) greater attachment style dismissingness and increased cigarette smoking; 3) increased cigarette smoking and higher mean HbA1c [hypotheses 1, 2, and 3 collectively relate to specific aim # 2]; 4) higher levels of attachment style dismissingness and more frequent visits to primary care providers; 5) more frequent visits to primary care providers and higher HbA1c [hypotheses 1, 4, and 5 collectively relate to specific aim #3]; 6) higher levels of attachment style dismissingness and lower levels of trust in the primary healthcare provider; and 7) lower levels of trust in the primary healthcare provider and worse diabetes health (i.e., higher mean HbA1c) [hypotheses 1, 6, and 7 collectively relate to specific aim #4].

CHAPTER 3 - METHODS

The Harborview Diabetes Care Study (HDACS) was designed to develop evidence-based clinical interventions to improve patient-provider relationships and diabetes treatment outcomes; the current study was conducted by performing secondary analyses of data collected for use in the HDACS.

I. Sample recruitment and data collection

Between the months of September 2007 and March 2008, members of a research team at the Harborview Medical Center (HMC)—a safety-net hospital located in Seattle, Washington—approached 660 adult patients who sought diabetes care at HMC. They attained consent from 469 of these patients, and successfully collected data from 295 study participants, which yielded an overall study response rate of 44.7%. Among those who initially gave consent, 72 (15.4%) refused to participate, 18 (3.8%) were lost to follow-up, and 84 (17.9%) were deemed ineligible, either because they were deceased (23.8%), did not speak English (48.8%), did not have a diagnosis of diabetes (13.1%), were unable to be contacted (6.0%), were incarcerated (1.2%), or were no longer patients at HMC (7.1%).

No data were collected on the characteristics of individuals who elected not to participate in the study, and analyses regarding the degree of bias that the considerable non-response rate contributed to this study's results are, at present, impossible to conduct. Therefore, the possibility that non-respondents in this study differed significantly from respondents on unmeasured characteristics that relate to outcomes and exposures cannot be ruled out. Reasons for the low response rate potentially included minimal compensation for participation in the

study, the administration of a fairly lengthy patient questionnaire in only one language, and a high proportion of low-income individuals among members of the target population. Low-income individuals are more often affected by housing instability or homelessness, and are more likely to provide temporary contact information (e.g., they are more likely to live in homeless shelters, hotels, or other temporary housing arrangements, to use pre-paid cell phones, etc.), which reduces the likelihood of contacting them about their participation in a study.

This study relied exclusively on the HDCS data about patients affected by type 2 diabetes. It excluded 14 (~5%) of the HDCS participants, who were identified as type 1 diabetics, from its analyses. This reduced the total sample size available for the current study to $295 - 14 = 281$ participants. Type 1 diabetics were excluded to minimize bias that potentially results from combining participants with separate diseases. Research indicates that type 1 and type 2 diabetes are associated with different etiologies, ages of onset, treatment regimens, psychosocial outcomes, and pathophysiologies, which may divergently influence the ways that affected individuals respond to certain pathogenic risk factors (e.g., Ciechanowski, et al., 2003; Maia, Braga, Brouwers, Nardi, & Oliveira e Silva, 2012; Refer to subparts 2.III.D. and 2.I.B. of this thesis for a more detailed discussion of this issue).

The HDCS researchers contacted, or attempted to contact, all eligible study participants on multiple occasions—first by mailing postcards, and later by sending envelopes that contained consent forms, questionnaires, information letters, self-addressed, postage paid envelopes, and \$2 for participation. They subsequently contacted patients by phone, and by mail with a reminder letter. Other patients presenting for visits at the clinics were approached and asked to complete an in-person structured interview, using an identical version of the HDCS questionnaire in English, with a member of the research team.

All 295 HDCS participants completed questionnaires and granted the study team permission to retrieve automated data on several measures from their HMC patient medical records. Inclusion criteria for the HDCS were that participants had a diagnosis of diabetes at the time of their enrollment into the study, and that they were at least 18 years of age and currently patients at the HMC Adult Medicine or Family Medicine Clinic. In addition to the exclusion criteria detailed in this paper's description of those patients who initially consented to participate, but who were subsequently deemed ineligible, refusal to permit the extraction of data from a patient's medical records resulted in exclusion from the study.

II. Measures

This section identifies the source of each question used in the current study, but in some cases the question sources could not be identified, due to a lack of access to the researchers who designed the HDCS questionnaire.

A. Exposure

i. Attachment style

Participants' attachment styles were determined by their responses to a modified version of the Relationship Questionnaire (RQ) (refer to Appendix C). The RQ constitutes a moderately valid and reliable instrument (Bartholomew & Horowitz, 1991; Ahrens, et al., 2012; Meredith, et al., 2005; Scharfe & Bartholomew, 1994; Herzberg, Hammen, Burge, Daley, Davila, & Lindberg, 1999) that has been shown to remain stable over periods of up to several years in adult study populations (Kirkpatrick & Hazen, 1994; Griffin & Bartholomew, 1994a; Ahrens, et al., 2012; Hamilton, 2000; Waters, Merrick, Treboux, Crowell & Albersheim, 2000). The RQ provides a brief description of each attachment style and asks participants to rate, on a 7-point

Likert scale, the extent to which they believe that each description encapsulates their general style of relating to other people (Bartholomew & Horowitz, 1991). It then inquires as to which single attachment style description each participant feels characterizes them best, as a means of determining their predominant attachment style sub-type in the event of a tie on their response to the first part of the measure (Bartholomew & Horowitz, 1991). The structure of the RQ allows investigators to measure attachment style using either ordinal or categorical indicators. While both versions of the measure appear commonly throughout attachment theory research, some studies suggest that the ordinal indicator demonstrates a greater degree of validity (refer to the discussion in subpart 2.III.C.ii. of this thesis).

Uses of the RQ on an ordinal scale typically measured participants' positions along the two attachment style dimensions (i.e., attachment anxiety and attachment avoidance). The current thesis employed a third approach, which used an ordinal scale, but focused on each participant's similarity to one particular attachment style prototype/category. Namely, this thesis focused on the extent of each participant's "dismissingness," as measured by their position on the 7-point Likert scale that corresponded to the description of the dismissing attachment style, appearing on the attachment style measure. It posits that, regardless of which attachment style category predominates in any given individual, the severity of their dismissingness affects their associated outcomes (i.e., the diabetes health outcome evaluated by this study) (Refer to the discussion in subpart 2.III.D of this thesis). The reason that this thesis convened on the dismissing attachment style, as opposed to all of the attachment styles, or any other attachment style in particular, followed from the fact that existing research on diabetes and attachment theory indicated that the dismissing attachment style consistently related to the worst diabetes health outcomes (Refer to subpart 2.IV.C. for a discussion about diabetes and attachment style).

The literature review that this thesis undertook in its previous subparts challenged the validity of such evidence, but its current study aims to both test and build on it.

The particular question that this thesis interrogated with its novel approach for measuring dismissingness via the RQ asked participants to rate (on a scale of 1 to 7, wherein 1 indicated “not at all like me”, 4-5 indicated “somewhat like me”, and 7 indicated “very much like me”) the extent to which the following description (of a dismissing attachment style) corresponded to their general style of relating to people:

***Style D:** I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or to have others depend on me.*

Utilizing an ordinal scale of measurement for attachment style contained the statistical advantage of allowing for the use of the full range of the data that this variable captured (i.e. for *all* study participants). By contrast, a categorical attachment style indicator only contributed the fraction of the data that related to the *predominantly* dismissing study participants available for statistical analyses. Moreover, statistical software tended to treat variables on ordinal scales as, essentially, continuous, which thereby imposes the additional constraint prescribed by an assumption of linearity. This resulted in a slight increase to the statistical power of the related analyses, when compared to that of the analyses carried out in conjunction with a categorical version of the variable.

The presentation of the HDCS study question that elicited attachment style (Appendix C to this thesis) deviated from that which appeared on the actual Relationship Questionnaire (Appendix B to this thesis) (Bartholomew & Horowitz, 1991; Bartholomew, 2015), to some degree. Notably, the altered version of the RQ that HDCS investigators implemented in their

data collection located the response scale associated with each attachment style directly below its corresponding prototype description, and inscribed it within a box. The midpoint for each scale centered on the value of four (half-way between the endpoints of 1 and 7), but the description of the midpoint (i.e., “somewhat like me”) hovered above four and five (mostly above five), and this possibly encouraged respondents to rate themselves more highly, in terms of their attachment style severities (Refer to table 3, which summarizes the mental health characteristics and attachment styles of all study participants, for participants’ averaged aggregated outcomes on a measure of attachment style dismissingness).

B. Potential mediators

i. Maladaptive coping behaviors: Cigarette smoking

This thesis measured cigarette smoking with two sequential questions (origin unknown):

- a. *Have you smoked at least 100 cigarettes in your entire life? (Yes/No); and*
- b. *Do you now smoke cigarettes every day, some days, or not at all?*

To reduce the number of analyses carried out in the current study, the researcher combined the two questions into a single item with four levels—1) never smoker; 2) former smoker; 3) current smoker, some days; and 4) current smoker, every day (Refer to table 4, which summarizes participants’ results in connection with indicators of their patient-provider relationships and their maladaptive coping behaviors, for averaged aggregated outcomes regarding to participants’ smoking statuses).

ii. Visit frequency

This thesis evaluated the frequency with which individuals visited their primary health care providers by analyzing HDCS data for the following two-part question:

1) *Do you have a regular or usual source of medical care?*

And, if yes:

2) *How many times in the **LAST 12 MONTHS** have you seen this person?*

If participants answered “No” to the first question, they encountered a prompt that instructed them to skip the second (and additional subsequent) question(s). They responded to the second question by entering any possible number, rather than selecting one of several response categories.

As stipulated by the literature review for this thesis, attachment theory research appeared to suggest that visiting one’s provider either too frequently or too infrequently increased their risk of incurring sub-optimal health outcomes (Refer to subsection 2.IV.D.). Established guidelines existed, with regards to the minimum number of visits that may be considered adequate for type 2 diabetics with well-controlled risk factors (ADA, 2015), but not for the maximum number of visits. This thesis adopted that minimum number (i.e., 2 visits per year) as a cut-point to dichotomize participants’ responses to the visit frequency question, into categories that accord with whether each participant accrued an adequate vs. inadequate number of visits to their primary care provider over the course of the preceding year (Refer to table 4 for a summary of this outcome in all study participants).

iii. The patient-provider relationship: Trust

The HDCS measured participants' trust in their health care providers by asking them to rate, on a five-point Likert scale (0 = strongly agree; 1 = agree; 2 = neutral; 3 = disagree; and 4 = strongly disagree) the extent to which they agreed with the following statement:

“I trust my primary doctor or nurse practitioner so much I always try to follow his/her advice.”

The source of this question remained unknown, and its wording appeared somewhat ambiguous. Nonetheless, it solicited some information about whether participants viewed their “primary” healthcare providers (i.e. considered as attachment figures in this study) as trustworthy (Refer to table 4 for a summary of participants' aggregated outcomes on this measure of trust). A side-by-side box plot of the relationship between attachment style dismissingness and trust in the primary provider revealed a significant degree of skewness. Consequently, the researcher converted the original, ordinal trust variable into a binary variable, where a 0 or 1 (strongly agree and agree) coded for a “yes” response to the statement interrogated by the trust question, and 2, 3, or 4 (neutral, disagree, or strongly disagree) coded for a “no” response. This enabled the investigator to analyze the hypothesis involving trust and dismissingness via logistic regression.

C. Outcome

i. Diabetes health outcome: HbA1c

To minimize the issues involved in multiple comparisons, this study restricted its analyses to only those that focused on a single diabetes health outcome: HbA1c. This excluded from the analyses other diabetes health outcomes of interest, such as systolic blood pressure and

LDL levels, or adherence to diet, exercise, or medication regimens. The HDCS investigators derived HbA1c outcomes from the automated data that they collected from participants' medical records at HMC. The HbA1c value associated with each participant in this study represents the mean value of all HbA1c test results ascertained, for them, over the period of 12 months preceding their enrollments into the HDCS (Refer to table 5, which presents the aggregated biophysiological and behavioral diabetes health outcomes for all participants in this study, for a summary of participants' averaged HbA1c outcomes). Study participants varied with respect to the numbers of test scores that each contributed to their individual averaged HbA1c outcomes (e.g., some participants had only one HbA1c test score in their medical records for the previous year, while others had up to 6 HbA1c test scores). This raised some concern about whether differences in the numbers of test scores that accrued between individual participants resulted in any significant differences in their associated HbA1c estimates' variabilities.

Glycosylated hemoglobin (HbA1c) consists of a lab test that measured the average level of a patient's blood glucose over the prior 3 months (ADA, 2012a). Progressive resistance to insulin, combined with a progressive decrease in the ability of a type 2 diabetic's pancreas to produce insulin, results in elevated levels of blood glucose that, over time, cause widespread vascular damage, which, in turn, often leads to microvascular and macrovascular diabetes complications (e.g. heart attack, stroke, kidney failure, blindness or amputation). Hypotension and abnormalities of lipoprotein metabolism exemplify other types of metabolic dysregulations commonly found in people with diabetes (ADA, 2013a).

The current study evaluated HbA1c on a continuous scale, in order to facilitate the interpretation of its results in a manner that informs individualized treatment goals. Diabetes guidelines often encourage clinicians to consider HbA1c recommendations within the context of

patients' individual needs, preferences, and tolerances (e.g., Inzucchi, et al., 2012; Stetson, et al., 2011; ADA, 2013a; ADA, 2015). The ADA endorses a generalized HbA1c cut-point of $\leq 7.0\%$, but other practitioners and/or organizations routinely adopt lower (e.g., $\leq 6.5\%$) or higher (e.g., $\leq 8.0\%$) cut-points. Substantial evidence suggests that a cut-point of 7.0% corresponds to lower incidences of microvascular complications among type 2 diabetics (ADA, 2015; ADA, 2013a), but experts also acknowledge the appropriateness of adhering to less stringent A1C goals (e.g., $\leq 8.0\%$) in patients with, for example, histories of severe hypoglycemia, limited life expectancies, advanced microvascular or macrovascular complications, extensive co-morbid conditions, and/or long-standing diabetes in whom the general goal has proven difficult to attain despite consistent adherence to optimal care (ADA, 2015). Across multiple trials, many researchers found no significant differences in cardiovascular disease (CVD) outcomes (by far the most common cause of death among diabetics) for patients with type 2 diabetes when they tested the effectiveness of relatively aggressive HbA1c cut-points (e.g., $\leq 6.0\%$ or $\leq 6.5\%$), along with relatively aggressive cut-points for blood pressure and lipid levels (Dluhy, & McMahon, 2008; Duckworth, et al., 2009; The ACCORD Study Group, 2010; The Action to Control Cardiovascular Risk in Diabetes (ACCORD) Study Group, 2008; Sevick, et al., 2012). The ACCORD trial showed that no significant decrease in CVD deaths occurred, even in patients at especially high risks of CVD (The ACCORD Study Group, 2010). In fact, investigators stopped this trial early due to a 22% increase in the observed cardiovascular mortality for participants on intensive therapy (ADA, 2012a).

These trials generated considerable uncertainty about the role of intensive glucose control in the prevention of complications, how to balance the potential benefits of glycemic control against its risks in an individual patient, and how to arrive at an appropriate glucose target for a

specific patient (Ismail-Beigi, Moghissi, Tiktin, Hirsch, Inzucchi, & Genuth, 2011). At the same time, many experts now advocate for using individualized HbA1c targets based on methods that take several factors into account (e.g., comorbid conditions, psychological status, capacity for self-care, economic considerations, family and social support systems, LDL, blood pressure), as opposed to relying on a single threshold set in isolation (e.g., Ismail-Beigi, et al., 2011; O'Connor, Bodkin, Fradkin, Glasgow, Greenfield, Gregg, Kerr, Pawlson, Selby, Sutherland, Taylor, & Wysham, 2011; ADA, 2015), which some experts argue eventuates more harm than good for some diabetes patients (O'Connor, et al., 2011). These experts widely call for a shift from the use of goal-based measures to the use of risk-based indicators, more tightly linked to long-term diabetes outcomes (O'Connor, et al., 2011). O'Connor, et al. noted that focusing on a single, dichotomous score for each patient discards a large amount of information, such that each score lacks sufficient sensitivity for distinguishing between different plans and physicians, and it tends to exhibit poor reliability (O'Connor, et al., 2011; Reeves, Campbell, Adams, Shekelle, Kontopantelis, & Roland, 2007). Dispensing with a clinical threshold is less likely to motivate non-evidence-based treatments—to maximize appropriate care and minimize the unintended consequences of performance measures—while it shifts the focus of clinicians from moving patients barely above the threshold to barely below it, into using a patient-specific performance measurement that stretches across the continuum of benefit and risk (O'Connor, et al, 2011). Based on this reasoning, it appears that evaluating HbA1c according to a continuous scale likely maximizes the clinical utility of its associated study results.

D. Covariates: Potential confounders

Covariates in this study included variables likely to affect both the nature and/or manifestation of attachment style in adulthood and HbA1c, and those that affected either adult

attachment style and one or more of the hypothetical mediators conjointly, or one or more of the hypothetical mediators and HbA1c conjointly, but which substantively lied outside the causal pathways.

i. Demographic information

Several demographic variables arguably affected the natures of individuals' primary or secondary attachment styles, such as race, ethnicity, gender, age, marital status, and education (Van Assche, et al., 2013; Consedine & Magai, 2003; Fiori, Consedine & Magai, 2009; Montague, Magai, Consedine & Gillespie, 2003; Segal, Needham, & Coolidge, 2009; Waters, et al., 2000). Others affected the relationships between potential mediators in this study and HbA1c, but likely not attachment style (e.g., income level, job status, and insurance status). Generally, lower socioeconomic status comported with worse diabetes health (Berkowitz, et al., 2014; Osborn, Mayberry, Wagner, & Welch, 2014; Osborn, de Groot, & Wagner, 2013; Saydah & Lochner, 2010; CDC, 2014a), and some factors that SES subsumed, such as race, ethnicity and age, affected HbA1c for biological reasons (ADA, 2015). The current study evaluated demographic characteristics for participants, based on their self-reported outcomes (Refer to table 6 for a summary of the demographic characteristics of all study participants).

ii. Diabetes duration

Several studies reported finding that glycemic control was negatively associated with diabetes duration (Leelawattana, et al., 2006; Shim, et al., 2006; Tascona, Morton, Toffelmire, Holland, & Illiescu, 2006; Heisler, et al., 2007; Tien, et al., 2008). Diabetes may have altered the ways in which individuals related to their primary care givers, if they were diagnosed at a young enough age, with implications for attachment style (refer to discussions about the material

differences between type 1 and type 2 diabetics in subparts 2.I.A. – 2.I.C. and 2.IV.D. of this thesis). However, this thesis excluded type 1 diabetics from its analyses, and focused on an (relatively) older adult population whose members contracted diabetes (most likely) after the period of time wherein their chronically accessible attachment styles remained significantly responsive to the effects of environmental stressors (Refer to table 5 for a summary of participants' averaged outcomes on a measure of diabetes duration).

This study used the duration of diabetes variable on a continuous scale in analyses, as indicated by table 8 in the results section of this thesis.

iii. Depression status

The presence of major depression was detected from each participant's self-reported answers to the questions on The Patient Health Questionnaire (PHQ-9) (Refer to table 3 for a summary of participants' aggregated outcomes on this measure). This dual-purpose instrument establishes provisional depressive disorder diagnoses and grade depressive symptom severity; a clinical diagnosis of a depressive disorder additionally requires that a clinician rule out physical causes of depression, normal bereavement, and history of a manic episode (Kroenke & Spitzer, 2002). The PHQ-9 diagnosis of major depression has adequate sensitivity (73%) and high specificity (98%), relative to the same diagnosis based on structured interviews, and construct validity (Spitzer, Kroenke, & Williams, 1999; Kroenke, Spitzer, & Williams, 2001; Martin, Rief, Klaiberg, & Braehler, 2006). The HDCS investigators also evaluated dysthymia and minor depression, but this study considered only major depression, given that research on the relationships between dysthymia or minor depression and diabetes health outcomes remains sparse and inconclusive.

iv. Anxiety status

The indicator for anxiety status, constructed by the investigator in this study, denoted whether participants screened positive or negative (a binary scale) for at least one anxiety disorder, where anxiety disorders included moderate or severe generalized anxiety disorder, social phobia, and post-traumatic stress disorder (PTSD) (Refer to table 3 for a summary of participants' aggregated outcomes on this measure, and each of the subsumed measures of anxiety status). HDCS investigators ascertained generalized anxiety disorder status using a measure known as the GAD-7, and they assayed social phobia and PTSD statuses by way of participants' responses to the Anxiety and Depression Detector (ADD). The investigator in this study elected to exclude minor generalized anxiety disorder and panic disorder from the overall anxiety status indicator, given the low likelihoods that these conditions affected either attachment styles or diabetes health outcomes.

The GAD-7 is a valid and efficient measure, with good reliability, that allows clinicians and researchers to screen for generalized anxiety disorder and to assess its severity (Spitzer, Kroenke, Williams & Löwe, 2006). The GAD-7's criterion, construct, factorial, and procedural validity were established in the general population, as well as in a primary care population, and normative data were generated to facilitate comparisons between individual subjects' GAD-7 scores and those determined from a general population reference group (Lowe, et al., 2008).

The ADD was developed to fulfill a perceived primary care need—namely, the need to briefly and effectively screen primary care patients for common mental disorders associated with decrements in functioning, increased suffering, and higher medical and societal costs (Means-Christensen, Sherbourne, Roy-Byrne, Craske, & Stein, 2006). Measures of this type are premised on evidence which suggests that a lengthy instrument is not necessary for detecting

depression or any of several anxiety disorders (Mulrow, et al., 1995; Means-Christensen, et al., 2006). The authors of the ADD generated and assessed the diagnostic accuracy of five questions to screen for five common mental disorders: panic disorder, post-traumatic stress disorder, social phobia, generalized anxiety disorder (GAD), and depression. The HDCS questionnaire incorporated three out of the five questions comprising the ADD, which evaluated social phobia, panic disorder, and PTSD. Social phobia status derived from participants' responses (Yes/No) to the following question:

*“In the **PAST 3 MONTHS**, would you say that being anxious or uncomfortable around other people is a problem for you in your life?”.*

The authors of the ADD determined that the sensitivity and specificity of its analogous question are 0.69 and 0.76, respectively (Means-Christensen, et al., 2006). Data on PTSD statuses were ascertained from participants' responses to a 2-part question:

a. *“Some people have terrible experiences happen to them, like: being attacked or threatened with a weapon; being in a fire or a bad traffic accident; being sexually assaulted or abused; or seeing someone being badly injured or killed. Has anything like this ever happened to you?” (Yes/No) and*

b. *If YES: Over the **PAST 4 WEEKS**, how often have you been bothered by any of the following problems? (Each subsequent item corresponds to a rating scale wherein 0 = Not at all; 1 = Several days; 2 = More than half the days; and 3 = Nearly every day)*

(a) Upsetting thoughts, memories, or dreams about the event that have come into your mind against your will

- (b) *Feeling upset or having bodily reactions (such as fast heartbeat, stomach churning, sweating, dizziness) when reminded of the event*
- (c) *Being jumpy or being startled at something unexpected*
- (d) *Avoiding activities or situations that remind you of the event*
- (e) *Feeling distant or cut off from people, or emotionally numb*

The authors of the ADD found that the analogous question had a sensitivity of 0.62 and specificity of 0.83, compared with interview-based and other methods of diagnosing PTSD (Means-Christensen, et al., 2006). However, the HDCS question (shown above) asks participants to consider only the previous 4 weeks, while the ADD version asks participants to consider the previous 3 months, and the HDCS PTSD question specifically asked participants whether they experienced many more symptoms of PTSD (subparts (a)-(e) of part b of the question reproduced above), as compared to the symptoms that the ADD interrogates (in lieu of subparts b.(a)-(e) in the HDCS question, the ADD asks “*In the past 3 months have you had recurrent dreams or nightmares about this experience, or recurrent thoughts or “flashbacks” (times as though you felt it was happening again, even though it wasn’t)?*” (Means-Christensen, et al., 2006).

III. Statistical Analysis

All analyses were performed using STATA IC version 12.0.

A. Missing data

Many of the variables included in this study contained missing values. As stated in subpart 2.IV.D. of the current thesis, the investigator utilized the complete-case analysis method

for dealing with missing data, which involved excluding any participant with any data missing from any variable involved in at least one analysis conducted within the study. Stata commands designed to identify patterns in missing values were used for determining the numbers of respondents with complete data for all variables incorporated into this study. After excluding all participants with missing data for at least one variable in this study, the sample size consisted of 178 participants.

B. Exploratory analyses

i. Conformity with assumptions made by regression methods

This study graphically evaluated the association of HbA1c with ordinal and binary independent variables by assessing side-by-side boxplots of HbA1c versus categories of these variables (depicted in Figure 3). Residual versus predictor plots overlaid with lowess smoothers were also considered. QQ-Plots were evaluated to ascertain any significant violations of the normality assumption for the linear regression residuals. For hypotheses tested using linear regression analyses, the presence of outliers, influential observations, and heteroscedasticity were all evaluated by looking at plots of jackknife residuals. Unstandardized delta betas were calculated to evaluate the degree to which regression coefficients changed when influential observations were removed. In the event that influential observations were deemed unjustified, the researcher planned to remove or downweight them with robust regression. The researcher mitigated violations of the equal variances assumption by applying regressions with robust standard errors. Due to the cross-sectional nature of the data included in this study's analyses, independence can most likely be assumed.

ii. Evaluations of trends in data corresponding to study hypotheses

Preliminary evaluations of trends in the raw data corresponding to the study hypotheses consisted of visually assessing one graphical summary, and one numerical summary of the data. The graphical summary encompassed separate side-by-side boxplots of attachment style dismissingness and each hypothetical mediator (smoking status, visits to PCP, and trust in the provider) versus the outcome of interest (mean HbA1c). The numerical summary included cross-tabulations of each hypothetical mediator with attachment style dismissingness.

C. Descriptive statistics

Descriptive statistics for demographic and clinical characteristics were computed for the entire study population (tables 3-6).

D. Linear regression and logistic regression

Simple logistic regression was used to assess the crude associations of binary potential mediators with attachment style dismissingness. Simple linear regression was used to assess associations in all of the relationships for which hypotheses involved the continuous outcome, average HbA1c, and ordered logistic regression for the hypothesis that related to the association between the ordinal outcome, smoking status, and attachment style dismissingness (refer to tables 5 and 6). The relationships were then evaluated by adjusted linear, logistic, and ordered logistic regression models that variously included, as *a priori* specified covariates, indicators for race/ethnicity, gender, age, marital status, job status, insurance status, major depression, and any anxiety disorder (refer to table 2 for a description of which covariates were included in which analyses). Demographic variables were included in the analysis individually, owing to their low inter-item correlations, and the investigator adjusted on them as finely as possible within their

HDCS-stipulated categories (not all categories are reported in tables 3-6). Nominal variables were either modeled as dummy variables (i.e., race/ethnicity, insurance status) or converted to binary variables to conserve parameters (i.e., job status, marital status). Statistical significance was determined at the $\alpha=0.05$ level. The magnitudes of the estimated effect sizes are reported in table 8, in terms of regression coefficients (linear regression) and odds ratios (logistic regression), with 95% confidence intervals and associated p-values.

E. Mediation analysis

Determining that each potential mediator interrogated by this thesis mediated a relationship between the dismissing attachment style and a diabetes health outcome required that four conditions hold (Baron & Kenny, 1986; Ciechanowski, et al., 2004):

- 1) The exposure variable (dismissing attachment style) must significantly affect the outcome variable (diabetes health indicator) when regressing the outcome on the exposure;
- 2) The exposure variable (dismissing attachment style) must significantly affect the mediator variable (e.g., cigarette smoking status, visit frequency, trust in the provider) when regressing the mediator on the exposure;
- 3) The mediator variable (e.g. cigarette smoking status, visit frequency, trust in the provider) must significantly affect the outcome variable (diabetes health indicator) when regressing the outcome on both the exposure (dismissing attachment style) and on the mediator;

- 4) The effect of the exposure (dismissing attachment style) on the outcome (diabetes health indicator) must be less when the mediator (e.g., cigarette smoking status, visit frequency, trust in the provider) is controlled as in 3 than when it is not, as in 1.

CHAPTER 4 - RESULTS

I. Exploratory analyses

The regression diagnostic analyses undertaken at the outset of this study identified moderate skewness in the relationship between HbA1c and an ordinal variable expressing trust in the provider (not shown in figure 3). As a way of addressing this skewness, the investigator dichotomized the variable (shown in figure 3) and evaluated an associated hypothesis using logistic regression. Model diagnostics also revealed modest departures from the equal variances assumption, in some instances, which warranted the use of regressions with robust standard errors. Otherwise, the diagnostic assessment indicated no cause for model adjustments.

A side-by-side boxplot of attachment style dismissingness versus mean HbA1c over the previous 12 months (refer to figure 3) showed no evidence of a linear trend or association between the two variables. Similar graphical summaries of relationships between the hypothetical mediators and attachment style dismissingness (figure 3) signaled that mean HbA1c took on approximately the same average value, among participants, across all levels of exposure to cigarette smoking, and that mean HbA1c decreased modestly with achievements of the minimum number of visits to a primary care provider necessary in the previous 12 months, as well as with the presence of trust in one's primary healthcare provider.

Numerical cross-tabulations of the categories for each hypothetical mediator with the levels of severity for attachment style dismissingness (refer to table 7 (a, b, and c)) revealed little in the way of identifiable trends. However, the frequency of presenting as a former smoker appeared to generally increase with increasing levels of attachment style dismissingness.

II. Descriptive analyses

Participants in this study included 178 adults with type 2 diabetes, who averaged 57.75 years in age (refer to table 6 for a summary of participants' aggregate demographic characteristics). The sample consisted of a low SES population; forty-seven point seven five percent (47.75%) of participants reported an annual income of less than \$10,000, and 83.15% of participants reported an annual income of less than \$25,000. Only 21.91% of the study sample graduated from college, and only 11.24% were employed for wages. Only forty-two (42) participants, or 23.60% of the participants included in the sample for this study, presented as retired—less than half of the proportion of those participants who reported that they received Medicare. The majority of participants (53.37%) used Medicare as their insurance, while 15.17% had no insurance, and another 16.85% used Medicaid. The participants comprised a diverse study sample: 48.88% non-white, with approximately 21% black or African American, 8% Asian, and 6% Hispanic individuals. Only 30.90% of participants were married, and 86.63% of them considered themselves as having a usual source of care.

The study sample also encompassed individuals who, on average, reported relatively poor diabetes outcomes (delineated in table 5). Participants presented with an average of 4.15 comorbidities, according to the Wells, et al. (2000) comorbidity index included in the HDCS survey, with most or all of the conditions representative of a potential diabetes complications (refer to the discussion in subpart 2.IV.D.i.a. of this thesis). The vast majority of participants (88.76%) presented with 2 or more comorbidities/diabetes complications. Moreover, nearly half of the participants in this study took insulin as part of their diabetes treatments, and the average HbA1c value for all participants stood at 7.99%. On the other hand, systolic blood pressure and LDL outcomes appeared well-controlled, with averaged values of 131.23 mmHg and 95.04

mg/dl, respectively. Fifty percent of the study sample admitted to non-adherence (≤ 2 days per week) with exercise regimens, and approximately 23-32% admitted non-adherence to diet, glucose monitoring, or footcare regimens, but only 1.18% indicated non-adherence to medications.

Sixty-seven point six one percent (67.61%) of participants in this study presented with attachment style insecurity (refer to table 3). Considering attachment style as a categorical variable, 32.39%, 9.66%, 19.32%, and 38.64% of participants fell into the secure, preoccupied, fearful, and dismissing classifications, respectively. Among all study participants (irrespective of predominant attachment style subtype), the average level of dismissingness stood at 4.32 on a scale of 1 to 7, where 1 corresponded to low dismissingness and 7 corresponded to high dismissingness (refer to table 3).

III. Regression analyses

Table 2 articulates the individual hypotheses evaluated in this study and table 8 presents the adjusted regression models used for testing these hypotheses, along with their results. Most of the tests of this study's hypotheses returned statistically non-significant results. For hypothesis #1 (refer to table 2), the regression analyses revealed a non-significant trend of increasing HbA1c with increasing attachment style dismissingness. According to this trend, adjusted for potential confounders, HbA1c increased by 0.06% for every 1 unit increase in attachment style dismissingness, where attachment style accorded to an ordinal scale of 1-7. Hypothesis 2 (refer to table 2) failed to reach statistical significance, and suggested a trend in the opposite direction from that expected: As attachment style dismissingness increased, the adjusted odds of increased levels of smoking decreased by 3%. The regression analyses for hypotheses 3, 4, 5, and 6 (set

forth in table 2) also returned evidence of non-significant trends in the expected directions. Adjusted for potential confounders, for every 1 unit increase in dismissingness, the odds of visiting a PCP at least 2 times in the course of the previous year decreased by 23.0%, and the odds of trusting one's primary healthcare provider decreased by 5.1%. As smoking increased by 1 unit (from never to former to current, some days to current, every day) average HbA1c, adjusted for potential confounders, increased by 0.005%, and average HbA1c was 0.79% lower among participants who opted to visit their PCPs at least 2 times in the previous year, as compared to those participants who failed to visit their PCPs at least twice in the previous year.

Hypothesis #7 (specified in table 2) returned a statistically significant result in the expected direction. Participants who trusted their primary healthcare providers sustained lower levels of average HbA1c (0.925% lower) than participants who did not trust their PCPs. This constitutes a clinically meaningful difference, considering that researchers in a meta-analysis of findings for cardiovascular outcomes from the ACCORD, ADVANCE, and VA diabetes trials estimated that a reduction in HbA1c of approximately 1% coincided with a 15% decrease in the relative risk of non-fatal myocardial infarctions (ADA, 2012a).

Table 1: Summary of All Variables and Scales Used in Regression Analyses

Construct Name	Variable Name	Scale
Dismissing attachment style	rq4	Ordinal
Smoking status	SmokingDoseResponse	Ordinal
Minimum number of visits with provider	PCPVISITSGE2	Binary
Perceived trust in provider	Trustdocbinary	Binary
HbA1c	HBA1C_mean	Continuous
Major depression	Majdep	Binary
Any anxiety disorder	Anyanxietydisorder	Binary
Race	Race	Nominal
Gender	Gender	Binary
Age	Age	Continuous
Education	Educ	Ordinal
Income	Income	Ordinal
Job status	employ1binary	Binary
Insurance status	Insurance	Nominal
Marital status	Maritalbinary	Binary
Years with diabetes	Yrsdiab	Continuous
Ever did not follow a provider's recommendation	Notadvicecat	Binary

Table 2: Summary of Study Hypotheses

I. Hypotheses (N = 178)

Hypothesis #	Exposure	Outcome	Potential Confounders	Type of Regression
Association between attachment style dismissingness and a diabetes health outcome				
1	attachment style dismissingness	HbA1c	race, gender, age, major depression, any anxiety disorder	Linear
Associations between attachment style dismissingness and potential mediators				
2	attachment style dismissingness	smoking status	race, gender, age, major depression, any anxiety disorder	Ordered logistic
3	attachment style dismissingness	at least 2 visits to PCP or NP in the past 12 months	race, gender, age, major depression, any anxiety disorder	Logistic
4	attachment style dismissingness	perceived trust in primary provider	race, gender, age, major depression, any anxiety disorder	Logistic
Associations between potential mediators and a diabetes health outcome				
5	smoking status	HbA1c	race, gender, age, education, income, job status, insurance status, marital status, years with diabetes, major depression, any anxiety disorder	Linear
6	at least 2 visits to PCP or NP in the past 12 months	HbA1c	race, gender, age, education, income, job status, insurance status, marital status, years with diabetes, major depression, any anxiety disorder	Linear
7	perceived trust in primary provider	HbA1c	race, gender, age, education, income, job status, insurance status, marital status, years with diabetes, major depression, any anxiety disorder	Linear

Table 3: Mental Health Characteristics and Attachment Styles of All Study Participants with Type 2 Diabetes

Characteristics	All HDS participants with diagnoses of type 2 diabetes (N = 281)			All type 2 diabetic HDS participants with no data missing for any study variable (N = 178)		
	N	#	Mean (SD)	N	#	Mean (SD)
Severity of attachment style dismissingness (on a scale of 1-7, where 1 = low and 7 = high)	266		4.38 (1.90)	178		4.32 (1.91)
			%			%
Depression	247			178		
Major depression		69	27.94		54	30.34
Anxiety	281			178		
Severe generalized anxiety (GAD-7)		77	27.40		53	29.78
Moderate generalized anxiety (GAD-7)		93	33.10		65	36.52
PTSD		77	27.40		85	48.02
Social phobia		79	28.32		50	28.09
Attachment style	268			176		
Secure		83	30.97		57	32.39
Fearful		44	16.42		34	19.32
Preoccupied		30	11.19		17	9.66
Dismissing		111	41.42		68	38.64

Table 4: Indicators of the Quality of the Patient-Provider Relationship and/or Maladaptive Coping Behaviors for All Study Participants with Type 2 Diabetes

Characteristics	All HDS participants with diagnoses of type 2 diabetes (N = 281)			All type 2 diabetic HDS participants with no data missing for any study variable (N = 178)		
	N	#	Mean (SD)	N	#	Mean (SD)
Number of visits to primary care provider in the past year, among those participants who reported having a usual source of care	198		5.84 (6.50)	125		6.18 (7.76)
			%			%
Trust primary care provider so much that always try to follow his/her advice	277			178		
Strongly agree		110	39.71		78	44.32
Agree		121	43.68		71	40.34
Neutral		28	10.11		15	8.52
Disagree		10	3.61		8	4.55
Strongly disagree		8	2.89		4	2.27
Perceived discrimination from healthcare provider	278			178		
Always		13	4.68		8	4.49
Often		8	2.88		4	2.25
Sometimes		19	6.83		14	7.87
Rarely		21	7.55		10	5.62
Never		217	78.06		142	79.78
Smoking status	278			178		
Never smoker		95	34.17		54	30.34
Former smoker, among ever smokers	183	106	57.92		74	41.57
Current smoker, among ever smokers	183	77	42.07		50	40.32
Some days		16	8.74		11	6.18
Every day		61	33.33		39	21.91
Visited PCP ≤ 2 times in the past 12 mo.	198	12	6.06	178	9	5.06

Table 5: Biophysiological and Behavioral Diabetes Health Outcomes for All Study Participants with Type 2 Diabetes

Characteristics	All HDS participants with diagnoses of type 2 diabetes (N = 281)			All type 2 diabetic HDS participants with no data missing for any study variable (N = 178)		
	N	#	Mean (SD)	N	#	Mean (SD)
Years with diabetes	275		9.76 (9.50)	178		9.26 (8.96)
Diabetes health outcomes						
HbA1c (%)	238		7.94 (1.67)	178		7.99 (1.64)
BMI (kg/m ²)	246		35.58 (9.33)	178		36.07 (9.46)
SBP (mmHg)	246		131.27 (12.79)	178		131.23 (13.04)
DBP (mmHg)	246		74.36 (9.86)	178		74.60 (9.51)
LDL (mg/dL)	211		94.68 (31.35)	155		95.04 (32.27)
Number of diabetes complications (based on data from the Wells, et al. comorbidity index)	281		3.89 (2.71)	178		4.15 (2.54)
Diabetes self-care						
Number of days in the past week followed a healthy eating plan	277		4.17 (2.21)	176		4.06 (2.40)
Number of days per week over the past month followed specific healthy eating plan	240		4.24 (2.26)	176		4.16 (2.28)
Number of days in the past week participated in at least 30 min. of physical activity	280		2.79 (2.32)	178		3.20 (2.58)
Number of days in the past week followed a specific exercise plan	243		2.46 (2.52)	178		2.37 (2.58)
Number of days in the past week tested blood sugar	244		4.86 (2.67)	177		4.82 (2.69)
Number of days in the past week tested blood sugar the recommended number of times	240		4.55 (2.76)	175		4.32 (2.83)
Number of days in the past week checked feet	243		4.88 (2.60)	177		4.69 (2.70)
Number of days in the past week inspected inside of shoes	241		2.74 (3.01)	175		2.53 (2.99)
Number of days in the past week took recommended insulin injections, out of participants prescribed insulin	122		5.93 (2.17)	108		6.48 (1.29)
Number of days in the past week took recommended number of diabetes pills	185		6.31 (1.79)	178		6.32 (1.71)
			%			%
Diabetes health outcomes						
HbA1c ≥ 7.0%	245	175	71.43	178	124	69.66
BMI ≥ 30	216	157	72.69	178	131	73.60
SBP ≥ 140.0 mmHg	245	82	33.47	178	44	24.72
DBP ≥ 90 mmHg	245	44	17.96	178	14	7.87
LDL ≥ 100 mg/dL	187	71	37.97	155	87	48.88
Diabetes treatments	281			178		

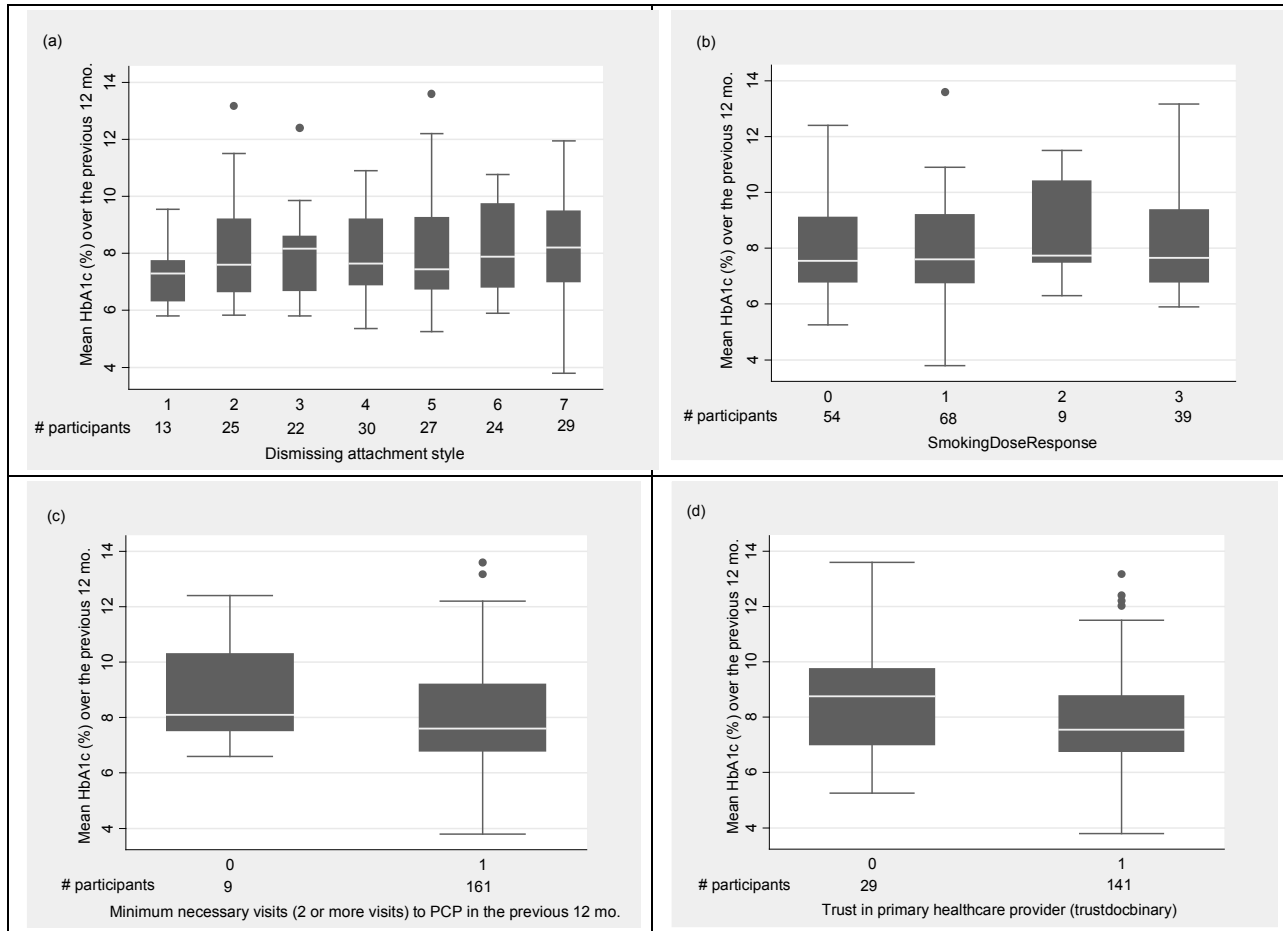
None		10	4.15		7	3.93
1-2 insulin shots per day		75	31.12		58	32.58
3 or more insulin shots per day		42	17.43		32	17.98
Pills (only) to control blood sugar level		106	43.98		78	43.82
Pills AND insulin		70	29.05		54	30.34
Diet only or other treatment		13	5.39		8	4.49
Medical comorbidities (Wells, et al. comorbidity index)	281			178		
Asthma		65	23.72	175	44	25.14
Hypertension		226	81.29	177	150	84.75
Arthritis		116	42.18	177	79	44.63
Physical disability		41	14.75	178	25	14.04
Dyspnea		57	20.65	176	40	22.73
Cancer (not skin cancer) diagnosed in the last 3 years		14	5.09	178	7	3.93
Neurological		20	7.17	178	13	7.30
Stroke		29	10.47	176	19	10.80
Heart failure		44	15.88	178	34	19.10
Angina		39	14.03	177	30	16.95
Other heart problem		52	18.71	178	38	21.35
Back problems		126	45.00	178	91	51.12
Stomach ulcer		28	10.04	178	16	8.99
Chronic inflamed bowel, enteritis, or Colitis		25	8.93	178	14	7.87
Thyroid disease		33	11.83	178	22	12.36
Kidney failure		22	7.91	177	14	7.91
Trouble seeing (even with glasses or contact lenses)		98	35.00	178	64	35.96
Migraine headaches		58	20.79	178	38	21.35
Participants with ≥ 2 diabetes complications (based on data from the Wells, et al., comorbidity index)		237	84.34	178	158	88.76
Diabetes self-care						
Diet non-adherence						
Followed healthy eating plan ≤ 2 days per week	241	59	21.00	178	41	23.03
Exercise non-adherence						
Followed exercise plan ≤ 2 days in the past week	244	134	47.69	178	89	50.00
Glucose monitoring non-adherence						
Monitored blood glucose ≤ 2 days in the past week	244	69	24.56	178	47	26.40
Footcare non-adherence						
Checked feet ≤ 2 days in the past Week	244	84	29.89	178	57	32.02
Medication non-adherence						
Took recommended number of medications on ≤ 2 days in the past week, among participants prescribed any diabetes medication	248	12	4.84	178	9	5.06
	73	38	52.05	53	25	47.17

Made no attempt to quit smoking in the past 12 months, among participants who self-identified as current smokers						
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Table 6: Demographic Characteristics of All Study Participants with Type 2 Diabetes

Characteristics	All HDS participants with diagnoses of type 2 diabetes (N = 281)			All type 2 diabetic HDS participants with no data missing for any study variable (N = 178)		
	N	#	Mean (SD)	N	#	Mean (SD)
Age, mean (SD), y	281		57.77 (10.23)	178		57.75 (9.62)
			%			%
Sex	281			178		
Female		128	45.55		77	43.26
Race	279			178		
White, non-Hispanic		137	49.10		91	51.12
Black or African American		72	25.81		38	21.35
Asian		24	8.60		15	8.43
Native Hawaiian or Other Pacific Islander		7	2.51		4	2.25
American Indian or Alaska Native		10	3.58		7	3.93
Hispanic		14	5.02		11	6.18
Other		15	5.38		12	6.74
Education	277			178		
Elementary or less		19	6.86		10	5.62
Some high school		30	10.83		22	12.36
High school graduate or some college/technical school		164	59.21		107	60.11
College graduate		64	23.10		39	21.91
Income	267			178		
Less than \$10,000		132	49.44		85	47.75
\$10,000 to less than \$25,000		87	32.59		63	35.40
\$25,000 to less than \$50,000		30	11.23		21	11.80
\$50,000 or more		18	6.74		9	5.06
Job Status	274			178		
Employed for wages		38	13.87		20	11.24
Self-employed		12	4.38		11	6.18
Unemployed		64	23.35		42	23.59
Retired		61	22.26		42	23.60
Unable to work		99	36.13		63	35.39
Marital Status	276			178		
Married		69	25.00		55	30.90
Previously married		112	40.58		64	35.96
Never married		78	28.26		51	28.65
A member of an unmarried couple		17	6.16		8	4.49
Insurance Status	277			178		
None		44	15.88		27	15.17
Medicaid		54	19.49		30	16.85
Medicare		137	49.46		95	53.37
Private		23	8.30		16	8.99
Retirement benefit		7	2.53		3	1.69
Don't know		12	4.33		7	3.93
Have a usual source of medical care	270	234	86.67	178	149	86.63

Figure 3: Side-by-side boxplots of the exposure (attachment style dismissingness) and each hypothetical mediator (smoking status, visits to PCP, and trust in the primary healthcare provider) vs. the outcome (mean HbA1c over the previous 12 months) (N = 178)



- (a) Attachment style dismissingness vs. mean HbA1c over the previous 12 months: Dismissing attachment style categories (1-7) represent the severity of attachment style dismissingness, where 1 = low dismissingness and 7 = high dismissingness.
- (b) Smoking status (SmokingDoseResponse) vs. mean HbA1c over the previous 12 months: SmokingDoseResponse categories include 0 = never smoker; 1 = former smoker; 2 = current smoker, some days; 3 = current smoker, every day.
- (c) Minimum necessary visits (2 or more visits) to PCP in the previous 12 months vs. mean HbA1c over the previous 12 months: Minimum necessary visits to PCP categories include 0 = no; 1 = yes.
- (d) Trust in the primary healthcare provider (trustdocbinary) vs. mean HbA1c: Trustdocbinary categories include 0 = no; 1 = yes.

Table 7 (a, b, and c): Cross-tabulations of each hypothetical mediator (smoking status, visits to PCP, and trust in the provider) with the exposure (attachment style dismissingness) (N = 178)

(a) Frequency (#,%) of smoking status by severity of attachment style dismissingness[†]

Smoking status (SmokingDoseResponse)*	Attachment style dismissingness (rq4)**							Total
	1	2	3	4	5	6	7	
0	4 7.41	8 14.81	10 18.52	6 11.11	11 20.37	8 14.81	7 12.96	54 100.00
1	5 6.76	9 12.16	9 12.16	12 16.22	13 17.57	10 13.51	16 21.62	74 100.00
2	1 9.09	1 9.09	2 18.18	3 27.27	0 0.00	2 18.18	2 18.18	11 100.00
3	4 10.26	7 17.95	3 7.69	9 23.08	5 12.82	4 10.26	7 17.95	39 100.00
Total	14 7.87	25 14.04	24 13.48	30 16.85	29 16.29	24 13.48	32 17.98	178 100.00

[†] The top number in each cell indicates the number of participants that fall into the corresponding category, and the bottom number in each cell denotes the percentage of participants that fall into the corresponding category

*SmokingDoseResponse categories: 0 = never smoker; 1 = former smoker; 2 = current smoker, some days; 3 = current smoker, every day

**rq4 categories: 1-7 on an ordinal scale, where 1 = low attachment style dismissingness and 7 = high attachment style dismissingness

(b) Frequency (#,%) of minimum necessary visits to PCP in the previous 12 months by severity of attachment style dismissingness[†]

Minimum visits to PCP (PCPVISITSGE2)*	Attachment style dismissingness (rq4)**							Total
	1	2	3	4	5	6	7	
0	0 0.00	1 11.11	3 33.33	0 0.00	0 0.00	1 11.11	4 44.44	9 100.00
1	14 7.87	25 14.04	21 12.43	30 17.75	29 17.16	23 13.61	28 16.57	169 100.00
Total	14 7.87	25 14.04	24 13.48	30 16.85	29 16.29	24 13.48	32 17.98	178 100.00

[†] The top number in each cell indicates the number of participants that fall into the corresponding category, and the bottom number in each cell denotes the percentage of participants that fall into the corresponding category

*PCPVISITSGE2 categories: 0 = No; 1 = Yes

**rq4 categories: 1-7 on an ordinal scale, where 1 = low attachment style dismissingness and 7 = high attachment style dismissingness

(c) Frequency (#,%) of trust in the primary healthcare provider by severity of attachment style dismissingness[†]

Trust in primary healthcare provider (trustdocbinary)*	Attachment style dismissingness (rq4)**							Total
	1	2	3	4	5	6	7	
0	0 0.00	4 13.79	4 13.79	8 27.59	3 10.34	4 13.79	6 20.69	29 100.00
1	14 19.40	21 14.09	20 13.42	22 14.77	26 17.45	20 13.42	26 17.45	149 100.00
Total	14 7.87	25 14.04	24 13.48	30 16.85	29 16.29	24 13.48	32 17.98	178 100.00

[†] The top number in each cell indicates the number of participants that fall into the corresponding category, and the bottom number in each cell denotes the percentage of participants that fall into the corresponding category

*trustdocbinary categories: 0 = No; 1 = Yes

**rq4 categories: 1-7 on an ordinal scale, where 1 = low attachment style dismissingness and 7 = high attachment style dismissingness

Table 8: Summary of results from regression analyses for all study hypotheses

Hypothesis #	HDS study participants with T2D, for whom data are complete with respect to all variables assessed by the current study's hypotheses (N = 168)								
	Outcome	Primary exposure	Type of regression	Crude regression coefficient	Crude odds ratio	P-value	Adjusted regression coefficient	Adjusted odds ratio	P-value
1	HbA1c	attachment style dismissingness	Linear	0.087		0.175	0.060		0.398
2	smoking status	attachment style dismissingness	Ordered logistic		0.996	0.960		0.970	0.701
3	at least 2 visits to PCP	attachment style dismissingness	Logistic		0.813	0.278		0.770	0.245
4	perceived trust in primary provider	attachment style dismissingness	Logistic		0.915	0.412		0.949	0.638
5	HbA1c	smoking status	Linear	0.073		0.513	0.005		0.967
6	HbA1c	at least 2 visits to PCP	Linear	-0.832		0.138	-0.790		0.199
7	HbA1c	perceived trust in primary provider	Linear	-0.732*		0.027*	-0.750*		0.046*

*statistically significant (p < 0.05)

CHAPTER 5 - DISCUSSION

The study carried forth in this thesis found evidence of a clinically meaningful, statistically significant association between increased trust in the primary healthcare provider and decreased HbA1c, among a sample of adults with type 2 diabetes who sought care at HMC during the year that preceded their enrollments into the HDCS. This finding is consistent with other studies, in which researchers reported associations between improved patient-provider relationships among their studies' participants, and better health/diabetes health outcomes (e.g., Ciechanowski, et al., 2001; Ciechanowski & Katon, 2006; Ciechanowski, 2007; Ciechanowski, et al., 2002a; Ciechanowski, et al., 2006(b); Morse, et al., 2006). Although the trend that this study detected, of decreasing trust in primary healthcare providers with increasing attachment style dismissingness, was of small magnitude and failed to reach statistical significance, researchers in other studies extensively documented evidence of inverse relationships between attachment style dismissingness, fearfulness and/ or insecurity, and interpersonal trust (e.g., Bartholomew, 1990; Bartholomew & Horowitz, 1991; Mikulincer, 1998; Mikulincer & Shaver, 2007; Klest & Philippon, 2015). In the context of healthcare, Klest & Philippon found that individuals with fearful attachment styles possessed significantly lower levels of trust in the medical profession than individuals with secure attachment styles (Klest & Philippon, 2015). Given the considerable evidence linking attachment styles to divergent and distinctive dispositions to trust from other studies on the subject (refer to the discussion in subpart 2.V.C.iii.a. of this thesis), the finding of a significant association between a lack of trust in the provider and higher HbA1c levels in this study suggests a pathway through which attachment styles may impact diabetes health.

The percentage of participants in this study who presented with secure attachment styles (32.39%; refer to table 3 and the discussion of this study's results) appears relatively small. By comparison, 59% of individuals qualified as securely attached in a nationally representative survey of adults (Mickelson, Kessler, & Shaver, 1997), as did 43.9% and 34% of participants in two studies of attachment style in patients from higher SES primary care populations (Ciechanowski, et al., 2006b; Ciechanowski, et al., 2002a). Primary care patients with diabetes generally contain higher proportions of individuals with attachment style insecurity relative to the general population (Ciechanowski, 2007; Ciechanowski, et al., 2006a). Additionally, Ciechanowski, et al. (2007) reported that roughly 48% of primary care patients with diabetes, across multiple studies, demonstrated predominantly fearful or dismissing attachment styles. An even higher proportion of participants in this current study (57.96%) presented with dismissing (38.64%) or fearful (19.32%) attachment styles (refer to table 3). This stands in sharp contrast to the general population, wherein approximately 25% of adults attest to manifesting a predominantly fearful or dismissing attachment style (Mickelson, et al., 1997).

Regarding the lack of a statistically significant association between attachment style dismissingness and HbA1c in the current study, the low SES composition of the target population possibly rendered attachment style status as less important in its determination of diabetes health outcomes, relative to the influences of other contributing risk factors, when compared to the significance of attachment styles for diabetes health outcomes in other studies (e.g., Ciechanowski, et al., 2001; Ciechanowski, et al., 2003; Turan, et al., 2003; Ciechanowski, et al., 2004; Ciechanowski, et al., 2010). The subjective threat posed by diabetes also potentially perdured as insufficient to activate the attachment systems of affected individuals in this study's population, whereby their healthcare providers never assumed the status of "attachment figure"

(attachment figure status depends on context, while healthcare providers specifically protect against health-related threats) in their cogitations (Maunder, et al., 2006; Maunder & Hunter, 2001). Indeed, researchers in two studies that evaluated their participants' perceptions of the risks associated with, and severities of, several common chronic conditions found that the participants rated the severity of diabetes as significantly lower than the severities of all other conditions (Wang, et al., 2009; Walter & Emery, 2006). Nonetheless, participants in the current study presented with an average of 3.89 comorbid health conditions, which intimates that they ostensibly operated under conditions of significant threats to their health. Another possible explanation for the lack of findings in support of the narrative that emerges from pre-existing research on diabetes and attachment theory is the modest sample size of the current study. Moreover, at several points in this study, the methodology divaricated from the methodologies that researchers in other studies on diabetes and attachment theory applied (as justified throughout the concurrent literature review and methods section). The results of the regression analyses in this study aver that none of the potential mediators examined therein mediated the relationship between attachment style dismissingness and HbA1c, and that the dismissingness-HbA1c relationship failed to reach statistical significance.

I. Strengths and limitations

A number of important strengths and limitations particularized the study in this thesis. Strengths include the use of automated data for HbA1c outcomes, in addition to HbA1c values that averaged the individual test scores of each participant over the course of a year, the availability of clinical diagnoses of diabetes, and the considerable diversity of the study sample. Importantly, the investigator in this study specified all hypotheses *a priori*, and selected all covariates on the basis of her scientific reasoning. The investigator in this study also refrained

from adjusting on downstream diabetes health outcomes (e.g., diabetes complications as part of a comorbidity index) in the analyses that interrogated an intermediate diabetes health indicator (i.e., HbA1c). All analyses excluded type 1 diabetics, which rendered the study sample homogenous with respect to diabetes type. Furthermore, a reliance on the complete case analysis method for addressing missing data ensured that all study hypotheses were tested on a uniform sample of study participants, and the focus on a single indicator of diabetes health status minimized the number of comparisons made over the course of a study that considered multiple potential mediators between attachment style and diabetes health. To the investigator's knowledge, this study represents the first to evaluate relationships between attachment style and diabetes health outcomes in an especially vulnerable, low SES population. Moreover, it adopted a novel approach to utilizing its RQ-based attachment style measure, which leveraged the evidence from existing research on attachment style and diabetes. In addition to the caveats acknowledged elsewhere in this thesis, the limitations of this study include its cross-sectional and often self-reported data, its modest response rate, and its reliance on brief, single-item measures of attachment style and trust.

II. Implications for diabetes care

Existing research countenances the theoretical (and potentially practicable) utility of incorporating attachment theory into diabetes interventions. Knowledge of patients' attachment styles promises to inform healthcare delivery approaches in ways that facilitate trust, empathy, collaboration, negotiation, and shared decision-making. Complementary research shows that patients adhere to their treatments more often if they perceive their physician as respectful, interested, supportive, and understanding (Thompson & Ciechanowski, 2002). An attachment theory perspective enables clinicians to focus on patients' unique fears, perspectives on their

illnesses, and general underlying needs, while it alerts them to the possibilities of worsening medical illnesses or imminent complications in patients who tend to routinely underreport their symptoms (Thompson & Ciechanowski, 2002).

To the extent that patients' attachment styles predict their levels of trust in their healthcare providers, screening on attachment style in a clinical setting stands to motivate providers and healthcare organizations to discriminate against certain patients. Research shows that trust predicts patients' continuities with/loyalties to their PCPs, and that it corresponds to other desirable outcomes, such as willingness to seek care or share sensitive information, improved health status outcomes, and greater compliance with treatment recommendations (Platonova, Kennedy, & Schewchuk, 2008; Lee & Lin, 2011; Hillen, et al., 2011; Müller, et al., 2014; Hall, et al., 2002; Dugan, et al., 2005; Calnan & Rowe, 2006). More importantly, trust strongly correlates with patient satisfaction, such that patients who trust their providers profess to higher levels of satisfaction with their medical care (Platonova, et al., 2015; Anderson & Dedrick, 1990; Thom, et al., 1999; Thom, et al., 2002; Brennan, et al., 2013; Hillen, et al., 2011; Hall, Zheng, & Dugan, 2002; Dugan, Trachtenberg, & Hall, 2005; Goold, 2002; Lee & Lin, 2011; Müller, et al., 2014; Safran, et al., 1998; Murray & McCrone, 2014). Complementary evidence indicates that insecurely attached patients report less trust in, and satisfaction with, their physician, and that trust mediates an association between attachment style insecurity and lower levels of patient satisfaction (Holwerda, et al., 2013). On the basis of such information, some authors (e.g., Carlin, et al., 2012) propose that providers seeking to improve their patient satisfaction scores assay related patient characteristics for consideration in their decisions about when to accept new patients or refer them to another provider.

Healthcare reform includes provisions that tether patient satisfaction (and other metrics of health service quality) directly to financial compensation for providers and healthcare organizations. For example, accountable care organizations stand to share in cost savings, contingent on their attainments of adequate ratings on measures of their services' qualities, of which several relate to patient satisfaction (Emanuel, 2015). Additionally, patient satisfaction begets patients' intentions to recommend service providers to other people (Platonova, et al., 2015). From an organizational perspective, improved patient satisfaction and loyalty lower the costs associated with recruiting and retaining new patients (Platonova, et al., 2015). Thus, providers and healthcare organizations sustain incentives to attract and retain those patients who most trust their healthcare providers, as a means of maximizing patient satisfaction.

Corresponding research suggests that the interpersonal relationship between the patient and their primary care doctor constitutes a major determinant of patient satisfaction (Platonova, et al., 2015; Carlin, et al., 2012). Meanwhile, screening on attachment style allows providers to identify those patients who struggle interpersonally. As a result, individuals with certain attachment styles plausibly face high risks of discrimination by their providers and/or healthcare organizations, in the absence of adequate protections.

Subpart 2.V.C.iii.c. of this thesis concludes with a proposal for (merely) one strategy to potentially mitigate discrimination by providers, on the basis of attachment style status (given contemporary evidence about relationships between attachment style and trust); which warrants re-visiting here (although an overview of strategies for preventing discrimination falls outside the scope of this thesis). Namely, this strategy prevails upon health/medical researchers and clinicians to consider evidence as to associations between attachment style and trust within a context that allows for the possibility of continuing dynamic interactions between the two

constructs; it asks researchers to conceptualize the trust disposition-attachment style relationship as, in some sense, retaining a capacity for flexibility—an approach not wholly incompatible with the position that attachment styles predict considerably stable dispositions to trust. At present, studies in health or medical research that consider adult participants' attachment styles in relation to their dispositions to trust their healthcare providers predominantly refrain from deliberately or explicitly defining the trust concept, or the trust-attachment style relationship (Refer to the discussion in subsection 2.V.C. of this thesis). To the extent that contemporary studies address the attachment style-trust disposition relationship, they tend to construe it as operating in only one direction (wherein attachment styles determine trust dispositions), but the literature reviewed in this thesis supports a broader perspective, which affords a bidirectional conceptualization of the trust-attachment style relationship. Importantly, maintaining that untrusting patients possess a capacity for trust under favorable conditions promotes an understanding whereby clinicians bear some responsibility for effectuating such conditions, rather than simply avoiding patients who present with certain attachment styles. The effects plausibly borne out by context on a study's implications map to the gulf that resides between the viable intervention (i.e., displays of trust in patients by providers, as described in subpart 2.V.C.iii.c. of this thesis) with its possibly improved patient care/patient health outcomes, and potentially suboptimal healthcare (e.g., due to discrimination by providers) and worse health outcomes, accompanied by discrimination and stigma.

Attachment theory putatively provides some direction for tailoring diabetes health interventions. For instance, a brief reflection on some aspects of trust theory and attachment theory earlier in this thesis (subpart 2.V.C.iii.c.) immediately yielded the identification of one potentially effective (by virtue of its consistency with the underlying theory) avenue for

interventions aimed to improve relationships between dismissing individuals and their healthcare providers: conspicuous acts of trust, by providers, in their patients with dismissing attachment styles. Given the association between trust in the provider and HbA1c reported by this study, diabetes healthcare providers should take a special interest in learning how to increase their patients' trust in them. In the case of dismissing diabetics, this potentially involves implementing interventions that maximize patients' autonomy (e.g., checking in with a patient via skype, rather than requiring them to attend an appointment in-person; involving the patient in all decisions regarding their medical care) (Maunder & Hunter, 2001). Improving patients' trust in their providers stands to enhance providers' experiences with their patients, elevate patients' relationships with their providers, augment patients' satisfaction with their healthcare, and promote better health-related outcomes.

III. Implications for diabetes prevention: Attachment theory and public health

Any evidence of associations between certain attachment styles and diabetes health carries with it implications that rapidly extend beyond the purview of clinical medicine and into the arena of public health. The high proportions of insecure individuals in this thesis' sample of diabetic patients, and in the diabetic study participants of other studies' samples, points to the salience of attending to matters of prevention, in addition to cultivating clinical approaches for mitigating the aversive sequelae of attachment style orientations for diabetes health. Policy experts assert that the very same reciprocal and dynamic interactions (or lack thereof) that drive amalgamations of primary attachment style working models precipitate healthy brain development in young children (National Scientific Council on the Developing Child, 2012; National Scientific Council on the Developing Child & National Forum on Early Childhood Program Evaluation, 2007). They argue that building a strong foundation for lifelong physical

and mental health requires the existence of responsive environments and supportive relationships in early life, beginning at birth. They point to research, consistent with attachment theory, which suggests that early social interactions influence the growth of connections among different areas of the brain important for thinking, learning, focusing attention, controlling emotion, and managing stress, whereby social neglect or deprivation tends to affect brain metabolism and result in increased risks of attentional, emotional, cognitive, and behavioral disorders later in life (National Scientific Council on the Developing Child, 2012; Shonkoff, 2012; Shonkoff, Garner, The Committee on Psychosocial Aspects of Child and Family Health, The Committee on Early Childhood, Adoption, and Dependent Care, & the Section on Developmental and Behavioral Pediatrics, 2012; Mercy & Saul, 2009). Prolonged or excessive stress in early childhood causes physiological disruptions that persist into adulthood and lead to disease, even in the absence of later pathogenic behaviors (Shonkoff, 2012; Shonkoff, et al., 2012). The associations between adverse childhood experiences and unhealthy adult behaviors (e.g., tobacco use, alcohol and illicit drug abuse, unprotected sexual activity) (Mercy & Saul, 2009)—theoretically mediated by attachment styles (Ahrens, et al., 2012; Sullivan, et al., 2009; Ciechanowski, 2007; Feeney & Ryan, 1994)—compound the ongoing burdens of socioeconomic disadvantage to serve as potent risk factors for poor health (Shonkoff, 2012; Shonkoff, et al., 2012). In part, health depends on the development of psychological, behavioral, and social competencies that influence future income and socioeconomic status (Mercy & Saul, 2009; Shonkoff, Ritcher, van der Gaag, & Bhutta, 2011), and attachment styles play important roles in effectuating such processes.

Children who experienced extreme neglect showed abnormal patterns of adrenaline activity, in some studies, which indicates a kind of biological “wear and tear” that leads to higher risks for anxiety, depression, and cardiovascular problems in the future (Gunnar, Frenn, Wewerka, & Van

Ryzin, 2009; National Scientific Council on the Developing Child, 2012). Successful recovery often requires more than the timely cessation of neglect, such as the application of a systematic, long-term, empirically supported intervention that promotes healing and fosters the development of secure attachments (National Scientific Council on the Developing Child, 2012). The timing of an intervention appears as critically important for predicting its outcomes, ideally occurring at a very early age (e.g., before 24 months) (National Scientific Council on the Developing Child, 2012; National Scientific Council on the Developing Child, et al., 2007). Evidence suggests a compelling need for reallocating resources both to and within the child welfare system, to expedite the design and implementation of programs that address the distinctive requirements of neglected children (National Scientific Council on the Developing Child, 2012), but the scope of the problem appears to invite solutions from other milieu, including advances in tax reform to ease the financial stressors affecting low SES families, parental leave policies that apply to the birth of a baby, the provision of mental health care for depressed mothers, and numerous other vectors that implicate early childhood education and public health (Shonkoff, 2012; Shonkoff, et al., 2012; National Scientific Council on the Developing Child, et al., 2007; Shonkoff & Fisher, 2013).

Where child welfare merely reacts to instances of childhood neglect, public health stands poised to prevent such eventualities. Attachment theory interventions could be designed to target expectant mothers, and disseminated alongside prenatal healthcare. For example, interventionists could provide expectant mothers with training in newborn/infant parenting skills that promote the formations of secure attachment styles in the affected children (Mercy & Saul, 2009; National Scientific Council on the Developing Child, et al., 2007). Well-child visits, laterally, allow for seamless follow-ups that favor fidelity with the intervention. More tailored

approaches might target new parents beset by additional burdens, such as chronic medical illnesses or psychological conditions. These scenarios underscore the potential for public health to ascertain and affect outcomes amid high risk cases that likely escape the attentions of professionals in child welfare institutions.

Shonkoff suggests that research on childhood adversity interjects a lifespan perspective on health promotion and disease prevention that involves mobilizing the entire medical community to focus more attention on the roots of adult diseases, many of which originate in the prenatal and early childhood years (Shonkoff, 2012; Shonkoff, et al., 2012). The prevention of maladaptive physiological and behavioral responses to adversity during childhood promises to reduce long-term population incidences of hypertension, cardiovascular disease, diabetes, depression, and other diseases disproportionately associated with childhood adversity (Shonkoff, 2012; Shonkoff, et al., 2012; Mercy & Saul, 2009). Early childhood interventions aimed at reducing adult disease call for a transformative re-organization and re-financing of the current healthcare system to promote greater horizontal and longitudinal integration (e.g., across medical, educational, and social services, throughout the lifespan) (Shonkoff, 2012). Healthcare reform offers a window of opportunity for instituting the necessary changes. Currently, barriers to implementing public health interventions grounded in attachment theory principles include a lack of measures to assess developmental skills and/or meaningful change over time (Shonkoff, 2012; Horsley & Ciske, 2005). The selection of appropriate biomarkers putatively confers evidence of the near-term effectiveness of interventions designed for reducing the risks of diseases that onset several years or decades later (Shonkoff, 2012). However, the incorporation of biological measurement into early childhood policy and practice requires considerable caution

and sensitivity to avoid the inappropriate labeling of young children, especially those who hail from particularly vulnerable populations (Shonkoff, 2012).

Critical actions for moving forward with public health and other early childhood interventions include the dissemination of new scientific findings to policymakers and practicing professionals, collaboration between researchers and coordination across policy and service sectors to identify vulnerable children and intervene as early as possible, improved access to non-stigmatizing community-based services, and deep investments in the development, testing, continuous improvement, and broad replication of cross-disciplinary innovative models that aspire to guide child welfare, early education, public health, and healthcare reform (National Scientific Council on the Developing Child; Shonkoff, et al., 2012; Mercy & Saul, 2009; National Scientific Council on the Developing Child, et al., 2007). In line with these initiatives, the CDC currently recognizes the prevention of child maltreatment (including neglect) as an imminent public health concern (Shonkoff, et al., 2012; Middlebrooks & Audage, 2009; CDC, 2014c; Mercy & Saul, 2009). Public Health—Seattle & King County (PHSKC), likewise, designed a policy-oriented intervention that aims to strengthen the early environments of children residing in King County, by 1) developing a partnership with early childhood development stakeholders, 2) building a common knowledge base, 3) developing and widely disseminating a local policy agenda informed by science, 4) organizing support at the community level, and 5) monitoring the policy environment (Horsley & Ciske, 2005). As part of this program, PHSKC initiated a public health-public school partnership with United Way of King County to abet the assessment of community-level school readiness (Horsley & Ciske, 2005).

Attachment theory stipulates a framework that exudes the capacity to integrate shared knowledge across multiple policy and service sectors, which aids in the accomplishment of

productive collaborations. It also emphasizes the idea that early developmental conditions affect all children, not just those exposed to especially deficient environments. While myriad factors other than attachment style contribute to diabetes/health-related outcomes, some researchers contend that “[c]ertain large goals of any worthy society—the mental and physical health of its members . . . —are likely to be achieved only to the extent that infants and children receive the benefits of . . . responsive attachment figures” (Cassidy, et al., 2013). To this end, the study of associations between attachment style and diabetes health constitutes a notably lofty and worthwhile pursuit.

CHAPTER 6 - REFERENCES

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CHAPTER 7 - APPENDICIES

I. Appendix A: Descriptions of attachment style prototypes (as reproduced from Maunder & Hunter, 2009)

Secure

Key behavioral observations

Positive self-esteem and self-acceptance combined with sociability (likes to be with others)
Comfortable and flexible in interpersonal relationships
Realistic appraisal of personal resources and challenges

Patterns in intimate relationships

Contact with attachment figures increases subjective comfort
Expects others to be sufficiently available, reliable, responsive and effective
Wants to be connected; close relationships are valued and characterized by warmth and reciprocity
Comfortable with self-disclosure

Social support

Uses support when available and benefits from it
Feels worthy of another's concern; high social self-efficacy
Positive appraisal of support from others

Affect regulation

Well-developed capacity to soothe self using both external support and internal resources
Flexible use of strategies that activate (expressing distress, seeking support) or deactivate (self-reliance, suppression of distress) attachment systems
Favors coping strategies of seeking emotional support, problem solving, and accepting the situation for what it is
Not prone to anger but assertive and manages conflict effectively; does not avoid discussion of conflict; expressions of anger facilitate repair and resolution; expectations of how other will react to anger are realistic; can use humor to maintain emotional "distance" from anger

Trait descriptors

Adaptable, confident, considerate, cooperative, dependable, easy-going, forgiving, likes to be with others, loving, optimistic, playful, sociable, stable, sympathetic, trusting, understanding, versatile, warm

Mentalization

Explanations of others' behaviors are based on context rather than inflexible expectations
Speculates about the thoughts, feelings and intentions of others; recognizes limitations on Speculations
Recognizes listener's need to be oriented and engaged
Realistic expectations of how others will act or feel

Narrative Coherence

Personal story is easily understood even when troubling: smooth chronological sequences,

balance of general themes and specific examples, consistent and noncontradictory
Descriptions of others are detailed and plausible

Preoccupied

Key behavioral observations

Frequent or urgent proximity seeking
Amplified expressions of distress

Patterns in intimate relationships

Anxious about finding and maintaining close relationships
Highly values physical and emotional closeness; feels too dependent
Expects or fears abandonment or rejection; parting (e.g., the end of a medical appointment) and separation are stressful
May act coercively (e.g., “I have to get angry to keep his attention”)

Social support

Relationships are ineffective in reducing distress or only temporarily effective; evaluates support negatively
Relationships are not reciprocal because need for support outweighs ability to provide support

Affect regulation

Experiences complex mixture of negative affect, including hostility, self-blame, fear and sadness
Does not feel resilient or capable; limited ability to soothe self
Overemphasis on attachment-activating strategies (expressing distress, seeking emotional and instrumental support) and emotion-focused coping strategies
Angry protest of another’s absence, insufficient support or interruption of support; anger serves to maintain interpersonal contact (e.g., expressed anger draws listener into sympathetic collusion (“how terrible he treated you that way”)); anger does not facilitate constructive resolution of problems
May be able to identify appropriate interpersonal actions (e.g., assertive discussion to resolve dispute) but inhibited in taking these actions

Trait descriptors

Acts without thinking, approval seeking, charming, clingy, complaining, dependent, distressed, emotional, expressive, flirtatious, frustrated, high-strung, moody, needy, passionate, romantic, reassurance seeking, self-revealing, sensitive, sentimental, spontaneous, temperamental, unstable

Mentalization

Descriptions of others are inconsistent or contradictory; frequent and often lengthy descriptions of personal (self) experiences interrupt stories about others
Expectations of others are unrealistic, based on personal need (e.g., expecting rescue) or schemas (e.g., expecting rejection)
Invites listener to substitute his or her perception of preoccupied person’s internal states for direct reports (e.g., Q: “How do you feel?” A: “Well, you know”)

Narrative coherence

Tells a personal story that is hard to follow
Urgency and drama convey insecurity or distress, but facts are vague or confused
Fragmented narrative: overinclusive of detail; multiple story lines; contradictory themes;

lengthy digressions; sudden changes in topics and chronological leaps; self-interrupted or run-on sentences; thoughts linked by affect or idiosyncratic internal associations
Chooses words that are vague, passive or nonspecific (e.g., refers to others with nonspecific pronouns (he, she, they) without introduction or clarification)

Dismissing

Key behavioral observations

Self-reliant, confident and independent; help seeking and expression of distress are minimal
Considers interpersonal relationships unimportant

Patterns in intimate relationships

Presumptive attachment relationships (e.g., marriage) appear cool and distant; closeness may be experienced as aversive or may express indifference to closeness

Mistrusts others; expects others to be exploitive, unresponsive, controlling or hostile; resists depending on others and interpersonal intimacy or self-disclosure

Values nonattachment relationships (e.g., friends who are not confidantes)

Relationships are not reciprocal because of mistrust; reluctance to expose self or devaluing others; may be intimidating, inattentive or aloof

Social behavior may appear scripted or not genuine

Social support

Does not experience physical contact or emotional closeness as soothing or desirable

Does not seek social support when stressed

Affect regulation

Copes with stress with cognitive distancing from emotions, denial, emotional disengagement, and distraction

Anger increases interpersonal distance

Trait descriptors

Ambitious, autonomous, competitive, cool, headstrong, independent, indifferent, individualistic, rational, sarcastic, self-reliant, tough, unemotional

Mentalization

Reflection may be disavowed (Q: Did you ever feel rejected as a child? A: "I really couldn't say"); apparent lack of curiosity about the inner worlds of others

Narrative coherence

Tells a personal story that lacks detail or reveals little of the self; generalizations dominate over particulars

Expressions of emotion are muted or vague

Verbal expressions are often used to close or control dialogue rather than to express the speaker's experience; thus, narrative may contradict itself

Alternative pattern

Compulsive caregiving; not aloof or intimidating but engaged with others' concerns while avoiding receiving care; maintains interpersonal distance and avoids acknowledgement of personal need by maintaining the role of the care provider; rigidly committed to care-providing role (versus blurred roles that occur in preoccupied overinvolvement); relationships are not reciprocal because of self-sacrifice

Fearful

Key behavioral observations

Undesired isolation from others

Tension between approach and avoidance (e.g., makes urgent same-day appointment and fails to appear)

Suffering without help seeking (e.g., frequent symptoms and infrequent medical visits)

Patterns in intimate relationships

Expects others to be harsh or rejecting

Experiences difficulty with assertiveness and social inhibition

Relationships are not reciprocal because of mistrust (fear of rejection), lack of intimacy and lack of self-confidence

Experiences strong ambivalence in relationships (e.g., tolerates unsatisfactory treatment to maintain alliance)

Manages relationships with tactical planning designed to avoid abandonment (e.g., “If I follow the rules, then I won’t have to start all over with someone else”)

Social support

Network of supportive others is small

Physical or emotional closeness does not usually result in subjective sense of security

Affect regulation

Intense negative affect is common

Feelings are typically overregulated and suppressed but may also use emotion-focused coping under conditions of high stress

Markedly impaired sense of self-agency with respect to both self-soothing (apparent lack of inner resources) and soothing contact with others (mistrust, fear of rejection)

Trait descriptors

Avoidant, cautious, distrustful, doubting, inhibited, introverted, pessimistic, reserved, self-conscious, self-protective, shy, timid, withdrawn

Mentalization

Impaired by qualities of both preoccupied attachment and dismissing attachment

A false impression of effective mentalization may result from high sensitivity to others’ cues predicting rejection or abandonment, but these inferences of others’ mental states are not flexible, amended by contrary evidence or effectively contextualized

Narrative coherence

May be similar to preoccupied attachment (excess affect, excess words, multiple fragmented story lines, deficits in local organization and efforts to orient the listener) or dismissing attachment (suppressed affect, minimal detail, a close, rigid and sparse story) or may mix or alternative emphasis between these elements

Alternative pattern

Angry withdrawal; anger rather than fear is the dominant response to the unavailability of others. In this pattern, anger often has the quality of a spiteful rejection of support that is considered insufficient or insincere. Overt anger is sometimes suppressed or passively communicated.

II. Appendix B: Relationship Questionnaire
(http://members.psyc.sfu.ca/labs/kim_bartholomew/attachment/self)

RELATIONSHIP QUESTIONNAIRE

PLEASE READ DIRECTIONS!!!

1. Following are descriptions of four general relationship styles that people often report. Please read each description and CIRCLE the letter corresponding to the style that best describes you or is closest to the way you generally are in your close relationships.

- A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.
- B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.
- C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.
- D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

2. Now please rate each of the following relationship styles according to the extent to which you think each description corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

	Not at all like me		Somewhat like me			Very much like me	
Style A.	1	2	3	4	5	6	7
Style B.	1	2	3	4	5	6	7
Style C.	1	2	3	4	5	6	7
Style D.	1	2	3	4	5	6	7

3. People sometimes report that their relationship styles differ depending on the people they are with. Thus you may feel that your style varies with different friends, family members, or romantic partners.

Think of your present romantic relationship. Your partner will be referred to as "P". Please read each description and CIRCLE the letter corresponding to the style that best describes you or is closest to the way you generally are in your relationship with P.

A. It is easy for me to be emotionally close with P. I am comfortable depending on P and having P depend on me. I am confident that P accepts me and that P will always be available for me.

B. I am uncomfortable being close to P. I want an emotionally close relationship with P, but I find it difficult to trust P completely, or to depend on P. I worry that I will be hurt if I allow myself to become too close to P.

C. I want to be very emotionally intimate with P, but I often find that P is reluctant to get as close as I would like. I am uncomfortable not being close to P, but I sometimes worry that P doesn't value me as much as I value P.

D. I am comfortable without a close emotional relationship with P. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on P or to have P depend on me.

4. Now please rate to what extent each of the four styles is descriptive of the way you are in your relationship with your partner P.

	Not at all like P		Somewhat like P			Very much like P	
	1	2	3	4	5	6	7
Style A.	1	2	3	4	5	6	7
Style B.	1	2	3	4	5	6	7
Style C.	1	2	3	4	5	6	7
Style D.	1	2	3	4	5	6	7

5. Your relationship style may also be similar to or different from the style of those people with whom you have relationships. Think of your current relationship partner P. Please read each description and CIRCLE the letter corresponding to the style that best describes P or is closest to the way P generally is in his or her close relationships.

A. It is easy for P to become emotionally close to others. P is comfortable depending on others and having others depend on him/her. P doesn't worry about being alone or having others not accept him/her.

B. P is uncomfortable getting close to others. P wants emotionally close relationships, but he/she finds it difficult to trust others completely, or to depend on them. P worries that he/she will be hurt if he/she allows him/herself to become too close to others.

C. P wants to be completely emotionally intimate with others, but he/she often finds that others are reluctant to get as close as he/she would like. P is uncomfortable being without close relationships, but he/she sometimes worries that others don't value him/her as much as he/she values them.

D. P is comfortable without close emotional relationships. It is very important to P to feel independent and self-sufficient, and P prefers not to depend on others or have others depend on him/her.

6. Now please rate to what extent each of the four styles is descriptive of your partner P.

	Not at all like P		Somewhat like P			Very much like P	
	1	2	3	4	5	6	7
Style A.	1	2	3	4	5	6	7
Style B.	1	2	3	4	5	6	7
Style C.	1	2	3	4	5	6	7
Style D.	1	2	3	4	5	6	7

III. Appendix C: Attachment style measure in the Harborview Diabetes Care Study (HDCS) questionnaire

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D. RELATIONSHIPS

D1. People vary in the way they relate to each other. Please rate each of the following four relationship styles according to the extent to which you think each description corresponds to your general style of relating to people. CIRCLE ONE NUMBER for each style (A, B, C and D) below.

Style A It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

Not at all like me			Somewhat like me		Very much like me	
1	2	3	4	5	6	7

Style B I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

Not at all like me			Somewhat like me		Very much like me	
1.	2	3	4	5	6	7

Style C I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

Not at all like me			Somewhat like me		Very much like me	
1	2	3	4	5	6	7

Style D I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or to have others depend on me.

Not at all like me			Somewhat like me		Very much like me	
1	2	3	4	5	6	7

D2. After reading the descriptions of each of the four relationship styles (Styles A through D above), please CIRCLE THE ONE LETTER corresponding to the style that best describes you:

Style A B C D

Harborview Diabetes Care Study Questionnaire; Version 2: 9/12/07

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