

HEALTH DISCLOSURE DECISION-MAKING: THE ROLE OF PROGNOSIS AND  
SYMPTOM UNCERTAINTY IN ONGOING DISCLOSURE TO A SPOUSE ABOUT  
A HEART-RELATED CONDITION

by

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## ABSTRACT OF THE DISSERTATION

Health Disclosure Decision-Making:

The Role of Prognosis and Symptom Uncertainty in Ongoing Disclosure to a Spouse  
about a Heart-Related Condition

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This study utilizes Greene's (2009) health disclosure decision-making model (DD-MM) to explore the role of prognosis and symptom uncertainty in patterns of disclosure to a spouse/partner about a chronic health condition. Toward this end, an *uncertainty and disclosure* model is hypothesized in which prognosis and symptom uncertainty and relational quality are expected to predict perceived partner support, communication efficacy, and the depth, breadth, and frequency of disclosure to a partner about a health condition. Patients with diagnosed heart-related conditions visiting a private medical office were recruited to fill out surveys. Measured variables included prognosis uncertainty (self-, partner-, and relationship-focused), symptom uncertainty (self-, partner-, and relationship-focused), relational quality, perceived partner support, communication efficacy to partner, and depth, breadth, and frequency of disclosure about one's health condition. The results indicated that (1) the key mechanisms identified in the DD-MM influence the depth, breadth, and frequency of disclosure about a chronic health condition; and (2) that

uncertainty plays a prominent role in people's patterns of disclosure to their partner about their heart-related condition. The findings and implications of the study are discussed.

**Keywords:** Uncertainty, illness uncertainty, relational uncertainty, disclosure, decision-making, efficacy, heart disease.

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## DEDICATION

To Mom and Dad

For being loving, faith-filled role models

And for teaching me that a job worth doing is worth doing well

To my husband John

For inspiring me with his work ethic and dedication to his profession

And for being a wonderful husband and father

To my children Meghan, Stephanie, Tara, and Johnny

For making me proud of them

And for reminding me about the important things in life

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Who always had something nice to say

And who made me laugh

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For being organized, professional, patient, thoughtful, and kind

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## CHAPTER ONE

### Introduction

Much research to date has explored the disclosure decision-making process in terms of sharing one particular piece of information. Such research informs scholars, for example, about the functions, reasons, and motivations for sharing personal information (see Derlega, Metts, Petronio, & Margulis, 1993; Greene, Derlega, & Mathews, 2006), private information (Petronio, 2000, 2002), and secrets (see Vangelisti & Caughlin, 1997; Vangelisti, Caughlin, & Timmerman, 2001). Recent models of disclosure decision-making (e.g., Afifi & Steuber, 2009; Greene, 2009; Omarzu, 2000) suggest that people weigh or balance numerous factors such as the risks and benefits of revealing (or not) prior to enacting a disclosure message.

Although research on managing one piece of information continues, we know less about the dynamic nature of the disclosure process. Disclosures do not necessarily cease after an initial revelation, or they may not be complete; that is, people continue to disclose information related to topics that are already known to the other person. In terms of sharing health-related information, Greene (2009) suggests that “people are constantly in a process where decisions have to be made about sharing updates, not simply the initial diagnosis” (p. 232). Updates related to a heart condition, for example, may include sharing with a partner or spouse<sup>1</sup> one’s anxiety about a chronically elevated blood cholesterol level, distressing side effects of a new medication, or advice from a recent doctor’s visit. Additionally, disclosures may involve superficial talk about a range of topics such as adjusting to new medications or making dietary changes, while avoiding in-depth talk regarding disease prognosis or fears about the future. Exploring patterns of

disclosure *beyond* the initial diagnosis may provide important information for better understanding of the disclosure decision-making process in general, and more specifically, health disclosure decision-making.

In addition to limits of initial disclosure, prior disclosure research has emphasized acute, life-threatening, and often contagious health conditions (e.g., HIV/AIDS or cancer),<sup>2</sup> yet many people are living with *chronic* health conditions and make decisions about providing information to others regarding their conditions on an ongoing basis. A chronic disease is defined as a noncommunicable illness that is prolonged in duration, does not resolve spontaneously, and is rarely cured completely (CDC, 2009). H. Leventhal, Halm, Horowitz, E. Leventhal, and Ozakinci (2004) argued that chronic illnesses share certain biological characteristics: 1) they are systemic, involving multiple body systems; 2) they are lifespan problems that often develop over years, but may not become evident until middle age; 3) they can be controlled, but few can be cured; 4) many have an insidious nature in that they develop gradually; and 5) they are characterized by relatively quiet phases, punctuated by severe episodes or dramatic onset of complications. Chronic diseases such as cardiovascular disease (primarily heart disease and stroke), cancer, and diabetes are among the most prevalent of all health problems. Seven of every 10 Americans who die each year, or more than 1.7 million people, die of a chronic disease (CDC, 2009).

Because chronic diseases are so prevalent and interminable, it is important to look beyond initial disclosure of a particular health condition and investigate the factors influencing subsequent disclosures. Disclosure decision-making is a dynamic process in which individuals assess (and reassess) information, a disclosure target, and risks/benefits

of sharing information (e.g., Afifi & Steuber, 2009; Greene, 2009; Omarzu, 2000). The management of chronic illness is dependent on the input and expertise of others (e.g., a partner) whose input often precedes medical care for the chronically ill individual (Leventhal, Brissette, & Leventhal, 2002). Thus, chronic health conditions provide a salient context in which to explore people's patterns of disclosure beyond initial revelation of information such as a health diagnosis (e.g., "I have diabetes").

Beyond coping with these chronic illnesses, many people living with such diseases are also managing chronically high uncertainty (Mishel, 1999). Uncertainty is a key feature in individuals' illness experiences (Babrow, Kasch, & Ford, 1998; Mishel & Clayton, 2003) and in people's management of health information (Afifi & Weiner, 2004; Brashers, 2001). Mishel (1999) argued that "uncertainty is a constant experience of chronic illness due to the unpredictable and inconsistent symptom onset, continual questions about recurrence or exacerbation, and an unknown future due to living with debilitating conditions" (p. 269). Additionally, unlike uncertainty in acute illness which tends to be localized in issues of diagnosis, treatment, and recovery, uncertainty in chronic illness involves broader aspects of a person's life (e.g., home, work) and influences daily routines and activities (Mishel, 1999).

For example, a woman recently diagnosed with heart disease may not only be experiencing uncertainty surrounding the diagnosis, disease progression, and adopting heart healthy lifestyle changes (e.g., low fat diet, aerobic exercise), but she may also be experiencing uncertainty about her ability to continue working or caring for her parent/s, partner, children, and/or grandchildren. Patterns of disclosure for a person managing uncertainty related to a chronic illness may mean sharing information with a partner

regarding medication side effects, daily blood pressure readings, or concerns about the future. On the other hand, s/he may share certain information with a friend, instead of a partner, to avoid worrying one's partner (Manne & Kless, 1997) or because s/he is not providing needed support (e.g., Marcuccio, Loving, Bennett, & Hayes, 2003).

Supportive communication from significant others in one's social network helps people manage uncertainty (Albrecht & Goldsmith, 2003). A growing body of literature indicates that being in a supportive relationship is one explanation for why marital partners live longer and enjoy better health than do unmarried individuals (for reviews see Burman & Margolin, 1992; Kiecolt-Glaser & Newton, 2001). Social support, for example, is particularly important for people with coronary artery disease in terms of managing depression (Bosworth et al., 2000; Shen, McCreary, & Myers, 2003), promoting a healthy lifestyle (Franks, Wendorf, Gonzalez, & Ketterer, 2004; see also Goldsmith, Lindholm, & Bute, 2006), for preventing accelerated disease progression (Wang, Mittleman, & Orth-Gomer, 2005), and other health outcomes (for a review see Littik et al., 2005).

The prolonged course of illness and disability from chronic conditions such as diabetes, arthritis, and cardiovascular diseases often results in extended pain and suffering and decreased quality of life for millions of Americans (CDC, 2009). While improved capabilities in diagnosis and treatment of such diseases may be good news for patients and families, it also "sets the stage for numerous sources of uncertainty" (Goldsmith, 2009, p. 209). Thus, the goal of this study is to provide a clearer understanding of how illness uncertainty, such as uncertainty about disease prognosis and symptoms, influences patterns of disclosure to a partner in the context of a chronic health



condition. The next chapter will review the theoretical frameworks relevant to the topics of interest including disclosure, models/theories of disclosure decision-making, and dimensions of uncertainty in areas of information management, relationships, and illness.

## CHAPTER TWO

### Review of Literature

#### *Disclosure*

Self-disclosure or sharing personal or private information with others is a key component in the development, maintenance, and deterioration of interpersonal relationships (see Altman & Taylor, 1973; Derlega et al., 1993; Greene et al., 2006). Jourard (1971a) was the first to use the term “self-disclosure,” and much scholarly research has since explored this phenomenon. Subsequent research shifted the focus from “self-disclosure” to a broader conceptualization that views “disclosure” as the process of revealing (or concealing) private information (e.g., Greene et al., 2006; Kelly, 2002; Petronio, 2002).

#### *Defining Disclosure*

The present study focuses specifically on the disclosure *process* and adopts Greene et al.’s (2006) definition of disclosure as “an interaction between at least two individuals where one intends to deliberately divulge something personal to another” (p. 411; see also Derlega et al., 1993; Greene, 2009). Whether they are verbal or nonverbal, disclosures are voluntary acts in which the discloser intentionally shares personal or private information that may be highly sensitive (e.g., “I have cancer”) or less immediate (e.g., “I have a family history of cancer”). Additionally, “self” disclosures are not necessarily restricted to information about the self. Greene et al. (2006) distinguish between *personal* self-disclosure (i.e., disclosure about oneself) and *relational* self-disclosure that focuses on one’s relationships with another or interactions with others. Further, disclosure (and nondisclosure) can reflect a *self*-, *other*-, or *relationship-focus*

(Derlega, Winstead, Greene, Serovich, & Elwood, 2004; Derlega & Winstead, 2001; Derlega, Winstead, & Folk-Barron, 2000; Greene et al., 2006).

Communication privacy management (CPM; Petronio, 2002) theory uses a metaphor of boundaries to illustrate the demarcation of private, relational, and public information (see also Altman, 1975, 1977). Personal boundaries manage private information about the self, while collectively held boundaries involve information not restricted to the self. Exactly *what* is disclosed, however, varies from person to person; that is, what is considered personal to one person may be considered private or secret information to another (e.g., Kelly, 2002; Venetis, Greene, Bagdasarov, & Banerjee, 2008a). For example, *why* people disclose is an area that has generated much research.

#### *Reasons for Disclosure*

Early disclosure literature focused on the role of self-disclosure in relationship development (e.g., Altman & Taylor, 1973; Derlega & Chaiken, 1977). People use self-disclosure to gather information about others and make predictions about the possibility of a future relationship (e.g., new friend or potential partner). Exactly what, when, and how much people self disclose and the reactions to the information by a disclosure recipient (e.g., reciprocity) help determine whether two people like and trust one another (Derlega, Winstead, & Greene, 2008a) and whether the relationship will continue. In general, there is a linear relationship between self-disclosure and the development of close relationships (Greene et al., 2006; see also Cozby, 1979). That is, the level of intimacy between relational partners increases as the variety of topics (breadth) and more in-depth information is disclosed. Although some researchers argue that self-disclosure may become less important as relationships progress (e.g., Derlega et al., 1993), others

argue that a balance between openness and closedness is beneficial for most relationships (e.g., Baxter & Montgomery, 1996; Finkenauer & Hazam, 2000; see also Goldsmith, Miller, & Caughlin, 2007).

In addition to relationship development, the reasons for disclosure/nondisclosure can be divided into several categories reflecting self-, other-, relationship-focused (Derlega, Winstead, Wong, & Greenspan, 1987; Derlega, Winstead, Greene, Serovich, & Elwood, 2004; see also Fitzpatrick, 1987) and situational environmental-focused benefits and risks (see Greene et al., 2006; see also Vangelisti & Caughlin, 1997, Vangelisti et al., 2001 on revealing secrets). *Self-focused* reasons for disclosing information involve rewards for the discloser such as catharsis, self-clarification, and seeking support (Derlega & Grzelak, 1979; Derlega et al., 1993). For example, couples disclose cancer-related topics to coordinate coping and support (Goldsmith et al., 2007). Reasons for disclosing HIV/AIDS status reflect an *other-focus* such as a duty to inform or a desire to educate (Derlega et al., 2000; Derlega et al., 2004; see also Greene et al., 2006). *Relationship-focused* reasons indicate a perception of connectedness or similarity to the other, having a close, supportive relationship (Derlega, et al., 2000; Derlega et al., 2004; Derlega, Winstead, Wong, & Greenspan, 1987; see also Greene et al., 2006), and function to renew commitment and affirm closeness (Goldsmith et al., 2007). Environmental-situational reasons for disclosure may involve availability of the disclosure target and the other's extent of involvement in the topic of disclosure (Greene et al., 2006).

Thus, there are numerous reasons why people self-disclose (e.g., relationship development, maintenance, catharsis, self-validation, duty to inform) and people make attributions for disclosures that reflect a self-, other-, relationship, - and/or situational

environmental focus. The reasons for disclosing, however, are intertwined with benefits derived from sharing personal information in relationships.

For example, greater self-disclosure is associated with greater satisfaction for marital (Fincham & Bradbury, 1989; Finkenauer & Hazam, 2000; Hansen & Schuldt, 1984; Jorgensen & Gaudy, 1980) and cohabiting couples (Lippert & Prager, 2001). In health contexts, women with breast cancer who shared concerns, feelings, and problems with their husbands enjoyed better psychological adjustment (Lichtman, Taylor, & Wood, 1987) and enhanced social and emotional adjustment, and self-esteem (Zemore & Shepel, 1989; see also Goldsmith et al., 2007). For patients who recently experienced a myocardial infarction (i.e., heart attack), talking with a partner about lifestyle changes can be empowering in terms of taking control of one's life but may also serve as a reminder of loss (Goldsmith et al., 2006). Further, low levels of self disclosure for patients with gastrointestinal (GI) cancers predicted lower relationship functioning and psychological distress (Porter, Keefe, Hurwitz & Faber, 2005). Thus, sharing personal information in relationships has its benefits. Yet, there are also risks involved in disclosing.

### *Disclosure Risks*

Individuals weigh the risks and benefits of disclosing private information and regulate their privacy boundaries accordingly (see Altman, 1975; Derlega & Chaiken, 1977; Petronio, 2002). For example, personal or self boundaries (Altman, 1975; Derlega & Chaiken, 1977; see also Derlega, Winstead, & Greene, 2008a) surround people's information and allow them to determine how open or closed they want to be with the information. Collective boundaries (Petronio, 2002) surround information that

relationship partners reveal to one another (Altman, 1975; Petronio, 2002). The idea of “shared ownership” of mutually disclosed information suggests that relationship partners weigh multiple goals in managing the dialectic to be open versus closed (Altman, Vinsel, & Brown, 1981; Baxter, 1988; Petronio, 2002; see also Derlega et al., 2008a; Derlega et al., 2008b; Greene et al., 2006). For example, after sharing information with a recipient, that person “co-owns” the information and the discloser expects that the recipient will observe the negotiated (or stated) privacy boundaries (Petronio, 2002). Although individuals report greater use of explicit rules (e.g., “Don’t tell anyone”) rather than implicit or no rules when sharing private information (Venetis et al., 2008b; see also Rodriquez & Ryave, 2002), disclosure recipients do not necessarily abide by the rules. Thus, there are times when individuals opt for nondisclosure of private information.

Risks to the self, other, and relationship are reasons for not sharing personal information in relationships (Derlega et al., 2004). For example, Derlega et al. (2004) found that reasons for nondisclosure of HIV-positive status included privacy, self-blame, and fear of rejection (self-focused), protecting the other (other-focused), having a superficial relationship (relationship-focused), and communication difficulty (self-, other-, or relationship-focused). Additional reasons for nondisclosure are that the other person can or will not be helpful (self-focused), concern about losing other’s respect (other-focused), and the information is not important to a relationship (relationship-focused) (Derlega et al., 2008a; see also Greene et al., 2006; Greene, Derlega, Yep, & Petronio, 2003).

Concerning the risks associated with sharing personal information for people in established (e.g., marital) relationships, Petronio (1991) argued that the disclosing spouse

must take into account five variables including the need to tell, predicted outcomes, riskiness of telling the information to the partner, privacy level of the information, and one's degree of emotional control. Further, Fitzpatrick (1987) argued that there are times when it is necessary for a spouse to conceal thoughts and feelings one has about the other that may hurt or anger him/her. The degree to which marital partners coordinate the boundaries between the demand (expectations) of the disclosing spouse and the reactions of the receiving partner may positively or negatively influence future disclosures and/or the relationship, in general. For example, Goldsmith et al. (2006) found that for patients recuperating from coronary artery bypass (CABG) surgery, communication with a romantic partner about adhering to a heart-healthy lifestyle conveyed positive messages such as caring, closeness, responsibility, recovery, and taking charge of one's health as well as less desirable messages such as control, criticism, sickness, loss, and futility.

In summary, there are numerous reasons why people disclose (or not) personal, private, and secret information to others. Such reasons involve both benefits and risks to the self, others, and relationships with others. People weigh benefits and risks in determining whether or not to disclose. Scholars have developed theories and models to explain the factors influencing people's disclosure decisions.

#### *Disclosure Theories/Models*

The sections that follow consider historically important theories explicating the role of self-disclosure in relationships, in managing private information, and the factors influencing disclosure/nondisclosure. For example, social penetration theory (SPT; Altman & Taylor, 1973; Taylor & Altman, 1987) conceptualizes how a relationship develops through stages and how communication (e.g., disclosure) enables its

development. Communication privacy management (CPM; Petronio, 2002) theory provides a framework for understanding people's privacy decisions, and other models help us visualize the disclosure process in general (e.g., Greene et al., 2006; Omarzu, 2000), and more specifically, disclosing health information (Greene, 2009), and secrets (Afifi & Steuber, 2009; Kelly, 2002). The following sections will briefly address these theories/models and utilize salient components in advancing a model for examining people's patterns of disclosure with a partner about a chronic health condition. The oldest of these theories, SPT, will be considered first.

### *Social Penetration Theory*

Altman and Taylor's (1973) social penetration theory (SPT) is the first "systematic theory and program of research" about the progression of close personal relationships (Greene, et al., 2006, p. 410). The notion of social penetration refers to (1) overt interpersonal behaviors that take place in social interaction and (2) internal, subjective processes which precede, accompany, and follow overt exchange (Altman & Taylor, 1973). Although self-disclosure is not specifically defined in SPT, the theory argues that self-disclosure is the verbal vehicle through which individuals become acquainted. Moreover, individuals increase the breadth (the range of topics) and depth (level of intimacy) of the information shared as relationships develop (Taylor & Altman, 1987).

Relationship development in SPT involves four sequential stages. *Orientation* is the earliest stage that occurs during initial encounters when individuals cautiously and tentatively make themselves accessible to others (e.g., sharing relatively impersonal biographical information). *Exploratory affective exchange* is the next stage characterized



by a more friendly and relaxed atmosphere in which individuals share a greater number of topics (i.e., breadth) and move toward increasingly intimate disclosures about those topics (i.e., depth). The development of close friendships and romantic relationships characterize SPTs' third stage, *affective exchange*, in which barriers are broken and partners learn a great deal about one another as they transition to the highest level of intimacy exchange possible. *Stable exchange* is the final stage of relational development characterized by continuous openness and richness across all levels of personality (e.g., one's fears, needs, values). Individuals are most comfortable with each other and know each other well.

The major SPT hypotheses are (1) that social penetration processes are orderly and proceed through stages, from superficial or nonintimate areas to more intimate, deeper levels over time, and (2) that relationship advancement depends on the amount and nature of rewards and costs. Additionally, SPT argues that development (i.e., penetration) and dissolution (i.e., depenetration) follow the same path in terms of the orderliness of progression and movement from superficial to intimate topic areas. Subsequent research, however, has disputed several of these hypotheses. For instance, Derlega et al. (1993) argued that in some relationships self-disclosure recedes into the background as newer, more pressing concerns develop; and in other situations (e.g., long-term marriages) self-disclosure may eventually level off and sometimes even decline. Greene et al. (2006) suggested that "relationship partners may cycle between being open and closed about what they disclose to each other" and that relationships may take alternative paths that are not necessarily linear (p. 413) (see also Cozby, 1979).

*Tests of the theory.* Taylor and Altman (1987) argued that although SPT had generated much interest, only portions of the theory had been tested to that point. For example, Taylor and Altman (1975) manipulated relationships between a confederate and participant by creating four disclosure categories: continuous positive, later positive, continuous negative, and later negative. Additionally, two conditions included short-term and long-term commitment. The authors examined differences in self-disclosure and costs and rewards among the conditions. The two positive groups enjoyed increased liking of the other, more openness and more intimate levels of disclosure over time, particularly in the long-term commitment condition, supporting SPT. Those in the negative groups demonstrated little increase in disclosure and a decrease in liking over time. The authors concluded that relationship development is a systematic process that is dependent on associated costs and rewards, supporting SPT. Furthermore, all conditions were more willing to disclose superficial information than more intimate information.

Other research explored the appropriateness of self-disclosure in relationships (e.g., Berg, 1984; Chaiken & Derlega, 1974a). Results suggested that too much information too soon (Berg, 1984) or too little information (Chaiken & Derlega, 1974a) may inhibit rather than promote growth in a relationship. More recently, researchers have utilized SPT to explore how the visual anonymity of computer mediated communication (CMC) influences online relationship development (e.g., Parks and Floyd, 1996; Walther, 1994, 1996). For example, Gibbs, Ellison, and Heino (2006) sought to extend theories of interpersonal relationship development (e.g., social penetration theory, uncertainty reduction theory) to the context of online dating. The authors expected that greater self-disclosure would lead to greater perceptions of success in online dating. Results indicated

that individuals with long-term goals of establishing face-to-face relationships (i.e., future interaction) engaged in higher levels of self-disclosure (e.g., more honest, disclosed more personal information, and made more conscious and intentional disclosures). Others have investigated SPT in relation to the quality of online and off-line relationships. For instance, Chan and Chen's (2004) study compared friendship quality ratings (e.g., breadth, depth, code change, understanding, interdependence, commitment, and network convergence) of Hong Kong residents' online and offline relationships. Higher degrees of friendship quality ratings (e.g., breadth, depth) occurred in offline friendships than online friendships. Yum and Hara (2005) specifically looked at the roles of culture and self-disclosure (i.e., SPT's breadth and depth) on relationship development via the Internet by comparing American, Korean, and Japanese users. Self-disclosure was directly associated with online relationship development for all three cultures.

Portions of SPT have also framed research on relational talk. For example, Knobloch, Solomon, and Theiss (2006) utilized SPT's notion of *depth* in their investigation of relational talk and evaluation of how intimacy predicts the production and perception of relationship talk for couples in dating relationships. Knobloch et al. argued that depth differentiates the public (i.e., superficial references to the relationship) versus private (i.e., intimate references to the relationship) nature of relationship talk. Of interest to the present study is that length of romantic interest, but not intimacy, was positively associated with the depth of relationship talk implying that length of romantic interest may be the more proximal predictor. Thus, as time passes, it may be less risky for people to talk about their relationship with their partner.

*Theory extensions.* Although the usefulness of SPT for exploring relationship development in online contexts continues, little research has extended the theory or further tested its components. One exception is Altman, Vinsel, and Brown's (1981) theory of privacy regulation which widened the scope of SPT by introducing the notion of dialectics where partners in a relationship have to balance oppositional tendencies (e.g., to be open versus closed) (see Derlega et al., 2008a; Greene et al., 2006). Additionally, Altman (1975) and colleagues added a boundary privacy metaphor as another component of the theory to illustrate how people regulate privacy and openness-closedness at the beginning of a relationship (see also Baxter & Montgomery, 1996; Derlega & Chaiken, 1977). As mentioned previously, with personal or self boundaries, partners adjust information about themselves, while collective boundaries surround the information that relationship partners reveal to one another. Petronio's (2002) communication privacy management theory (CPM; see also communication boundary management, Petronio, 1991) also extended Altman and colleagues' notion of collective boundaries.

*Summary.* SPT continues to be useful for exploring self-disclosure and relationship development especially in computer mediated communication (CMC) contexts (e.g., Gibbs et al., 2006; Parks & Floyd, 1996; Utz, 2000; Yum & Hara, 2005). However, the main premise of SPT is that relationships develop in a linear fashion as individuals gradually increase the breadth and depth of their disclosures. Research has since shown that there are alternative patterns of disclosure in relationship development and maintenance (Derlega et al., 1993; Greene et al., 2006). People in longer-term relationships, for example, may vary the depth, breadth, and frequencies of their

disclosures during times of stress such as a when couples are managing one partner's chronic health condition. Less research, however, has focused on the nature of disclosure in such relationships. While self-disclosure, per se, may seem to play a lesser role in established relationships, maintaining relationships involves managing inherent dialectics (e.g., being open versus closed) (Altman et al., 1981; Baxter & Montgomery, 1996; Petronio, 2002). The next sections provide theoretical explanations for how people manage disclosure of their private information, specifically CPM theory.

### *Communication Privacy Management Theory*

Communication privacy management theory (CPM; Petronio, 2002) has grown in popularity and is currently one of the dominant theories in the disclosure literature. CPM provides a theoretical framework for describing management of the competing dialectics of disclosure and privacy in interpersonal relationships. Petronio (2002) proposes five basic suppositions supporting a rule-based management system for regulating privacy. *Supposition 1* says that when we reveal, we disclose private information. *Supposition 2* utilizes a boundary metaphor to illustrate the lines between public and private information similar to SPT and extensions of SPT. Such boundaries may be permeable or impermeable and are linked with other privacy boundaries (e.g., I share private information with you, but I also share the information with my partner). Further, individuals' privacy boundaries involve *life span* changes. Boundaries are smaller when we are young, become larger through adolescence and adulthood, and may shrink as we age. For example, an elderly person managing a chronic heart condition may have fewer people in his/her social network to provide needed support. *Supposition 3* argues that individuals have the right to *own* and *control* their private information and thus have the

right to control whether they reveal or conceal that information. Further, we are co-owners of multiple types of information (e.g., our own and others). *Supposition 4* elaborates on CPM's rule-based management system which provides a way of understanding how private information is handled. Inherent to this system are two interrelated levels: personal management (e.g., managing our own information) and collective management (e.g., managing co-ownership of private information). Finally, *Supposition 5* addresses CPM's notion of dialectics which focuses on the tension "between and with the needs of being both private through concealing and public through revealing" (Petronio, 2002, p. 12). Similarly, Goldsmith et al. (2006) explored how couples coping with cancer balance communicating openly and avoiding talk about cancer-related topics.

According to CPM, the degree of revealing or concealing private information is regulated through privacy rule *management processes*. Petronio (2002) identifies three such management processes. First, *privacy rule foundations* address the way rules develop (i.e., cultural, gendered, motivational, contextual, and risk-benefit criteria) and reflect particular attributes of the rules (i.e., acquisition and properties). For example, privacy rules can be either implicitly or explicitly stated. Implicitly stated privacy rules tend to be ambiguous, while explicitly stated privacy rules are direct statements that specifically address the question of boundaries or further disclosure. For example, in a study of patients with heart disease, Goldsmith et al. (2006) found that the patients' partners had implicit rules for avoiding "nagging" their partners about making lifestyle changes (e.g., "We talk about it, but I don't want to nag him"). Other patients had more

explicit rules about changing their smoking behavior such as “There wasn’t any point in talking about it. I wasn’t going to quit until it was time to quit” (p. 2083).

The second management process, *boundary coordination operations*, focuses on accepting that boundaries around private information include both personal and collective borders. These personal and collective boundaries are managed in different ways (i.e., through boundary linkage, ownership rights, and permeability). For example, Petronio, Sargent, Andea, Reganis, and Cichocki (2004) conducted semi-structured interviews with college students to explore the role of family and friends as informal healthcare advocates. Specifically, the study focused on how people handle privacy issues when accompanying a friend or family member to a physician visit. Results indicated several emerging themes regarding privacy management when patient advocates participate in office visits including a dilemma between medical well-being and privacy, being an “altruistic supporter” who provides positive support to the patient, being seen as a provider of information by the physician, and sharing responsibility and decision-making. Overall, respondents reported that being included in a medical visit can be both a positive and somewhat demanding experience. However, being privy to another person’s medical information is risky business which requires boundary coordination (e.g., management of personal and collective borders).

The third management process suggests that boundary coordination is complex and involves multiple levels which may result in people experiencing *boundary turbulence*. When individuals encounter turbulence, however, they often attempt to correct the problem by adding new information to the rule system and/or making adjustments to stabilize the imbalance (e.g., “We don’t talk about it” versus “We don’t

talk about it, *except* when there is a problem”). CPM’s notion of implicit and explicit rules may provide a way to explain the range of topics shared and the depth to which individuals disclose to their partners about their chronic health condition.

*Applications of CPM.* CPM has been utilized as a theoretical framework for examining disclosure and privacy in various interpersonal contexts, especially health-related ones. For example, a privacy management perspective has been applied to disclosing child sexual abuse (Petronio, Reeder, Hecht, Ros-Mendoza, 1996), revealing HIV/AIDS status (Greene & Faulkner, 2002; Greene et al., 2003), disclosing medical mistakes (Allman, 1998), physician self-disclosure (Nadelson & Notman, 2002), and managing family and friends’ health issues (Petronio et al., 2004). Additionally, CPM has framed literature on revealing secrets (Caughlin et al., 2000), topic avoidance (Afifi, Olson, & Armstrong, 2005; Afifi & Schrodt, 2003; Caughlin, et al., 2000; Golish & Caughlin, 2002), and third party disclosure and gossip (Greene et al., 2003; Venetis et al., 2008b).

CPM’s usefulness as a framework for exploring the management of private information is evident; however, the abstractness and absence of testing makes it difficult to operationalize and quantitatively measure the theory’s components. Recent attempts have been made to develop scales measuring several specific model components.

For example, Serewicz and Canary (2008) found support for some CPM features, but not others, in their study of newlyweds’ perceptions of private disclosures received from their in-laws and the effects of such disclosures on their familial relationships. The researchers created scales to measure amount of information disclosed by in-laws, family privacy orientation, and family in-group status. The amount of private information that



in-laws had disclosed to participants was measured by 30 Likert-type items assessing information about the family's historical identity, acceptance of the newlywed, issues related to health and death of family members, problems and troubles of family members, problems in previous or ongoing marital and romantic relationships, and gossip. Privacy orientation (interior and exterior) was measured with 12 Likert-type items based on Petronio's (2002) conceptualization of the family privacy construct and on prior research by Morr (2002). Similarly, five Likert-type items measured family in-group status defined as the extent to which participants' perceived that their in-laws included them as a family members. In general, the findings provide support for CPM in terms of family privacy orientations related to various outcomes. Serewicz and Canary (2008) found that hearing in-laws disclose their love, recognition, and acceptance of one as a family member was linked with positive relational consequences; hearing in-laws disclose criticism and gossip about family members was linked with negative relational consequences, regardless of one's privacy boundary orientations. Moreover, people who believe that they are granted membership status in the family tend to be quite satisfied with their new family.

Unanticipated findings, however, suggested nuances in features of CPM regarding people's satisfaction with privacy management patterns that match their own family privacy rule orientation. That is, disclosures regarding acceptance and slander predicted a straightforward effect on satisfaction, but when disclosures dealt with relational trouble or historical identity, the receiver's (i.e., newlywed's) privacy orientation filtered the information received. These findings support previous research that disclosure on

particular topics does not always lead to intimacy and positive relational outcomes (Serewicz & Canary, 2008, p. 354; see also Parks, 1982; Petronio, 2002).

*Summary.* CPM has been shown to be useful as a theoretical framework in which to explore disclosure and privacy in various interpersonal contexts, especially health-related ones. Serewicz and Canary's study, however, illustrates that although minute portions of the vast CPM framework have been empirically tested, the theory has not been tested. Similar to SPT, CPM provides a *framework*, but not the *steps* involved in people's disclosure decisions. CPM views private information as the content of what is disclosed, whereas, SPT views self-disclosure in terms of changes in breadth and depth as relationships develop. Petronio (1991) argued that "the goal of the micro level is to suggest a possible set of patterns and to identify the variables salient for consideration in managing private information between marital partners" (p. 313). Much of the recent empirical literature applying CPM continues to be qualitative (e.g., Thorson, 2009; Durham & Braithwaite, 2009; Bute & Vik, 2010) and contributes to our understanding of privacy management. However, future research should develop measures for testing CPM components (e.g., Serewicz & Canary, 2008) in order to make predictions about access to private information, rather than continued applications of CPM as a theoretical framework in which to examine privacy issues. For instance, Greene and Serovich (1996) measured perceived appropriateness of disclosing HIV testing information and actual disclosure of HIV infection in their study of how individuals managed access to HIV testing information. More such studies are necessary for better understanding of the disclosure process.

Models of disclosure decision-making provide a mechanism for researchers to examine the factors predicting, and the process individuals go through when deciding whether (or not) to disclose a specific piece of information. The sections that follow will examine models for disclosing personal/private information (i.e., Greene et al., 2006; Omarzu, 2000) and health information (Greene, 2009).

### *Disclosure Decision Model*

Omarzu's (2000) disclosure decision model (DDM) is a general model which assumes that individuals strategically manage their disclosure to achieve social and personal goals. The DDM argues, for example, "that individuals decide what, how, and to whom they are going to disclose and that this decision is based on an evaluation of the possible rewards and risks of disclosing in any specific social situation" (p. 177). The disclosure process begins with *situational cues* that trigger a reward (e.g., approval, intimacy, relief) that can be achieved through possible disclosure. Next, individuals search for a *target* in whom to disclose and evaluate the *subjective utility* (defined as "the perceived value of a desired outcome") and *subjective risk* of a particular disclosure (p. 179). In addition to situational cues influencing the disclosure process, the model also allows for individual differences (e.g., introvert, extrovert) that may predict when and how different individuals might use disclosure to achieve particular social goals. Finally, individuals evaluate the subjective utility and subjective risks of disclosing to determine breadth, depth, and duration of disclosures. Omarzu (2000) defines *breadth* as "the number of topics covered by the disclosure," *depth* as "the intimacy level of the disclosure," and *duration* as "the sheer amount, or persistence, of disclosure" (p. 175). As subjective utility increases, individuals are expected to disclose greater depth and for a

longer duration, but with decreasing breadth (i.e., focusing on topics targeting one's goal). As disclosure risk increases, individuals are expected to disclose with less depth (i.e., intimacy). Thus, the DDM argues that assessment of the benefits and risks involved in achieving goals in social interaction predicts the breadth, depth, and duration of people's disclosures.

*Summary.* While the DDM is a useful mechanism for explaining the steps involved in social penetration processes (e.g., depth, breadth, duration of disclosure), it is less useful for predicting subsequent and less strategic disclosures, especially communication about a health condition for people in existing and/or long-term (e.g., marital) relationships. As stated by Omarzu (2000), the DDM is “best suited to predicting initial disclosures, disclosure in new relationships, or disclosure in highly strategic situations” (p. 183). Like CPM, the DDM suggests that individuals strategically manage their private information in terms of the risks and benefits of disclosing. Moreover, the DDM provides the steps involved in disclosure process in (albeit) limited contexts (e.g., initial interactions), while the CPM offers a more heuristic framework for examining privacy decisions in numerous contexts (e.g., developing, maintaining, health).

Although the DDM is a step forward in attempts to better understand the disclosure process, a drawback is that the model components have not been operationalized and the model has not been tested. The DDM's breadth and depth components, however, provide a way to conceptualize ongoing disclosure related to a chronic health condition. Exploring breadth and depth of disclosures may contribute to a better understanding of how people manage not only their chronic illnesses but their relationships as well. For example, for a person managing a heart-related condition,

disclosure may involve communicating with one's partner about a range of topics (i.e., breadth) such as medication side effects, daily blood pressure readings, or a recent weight change. On the other hand, individuals may be inclined to share intimate information (depth) about some topics but avoid in-depth disclosure about others (e.g., fears, sexual problems). More recent disclosure models (e.g., Greene et al., 2006) are applicable to varied relational contexts, and they are examined next.

#### *Model of Disclosure Decision Making*

Greene et al.'s (2006) model of disclosure decision making integrates concepts from prior research (e.g., Derlega & Grzelak, 1979; Greene et al., 2003; Omarzu, 2000; Petronio, 2002) to explain the *process* of disclosure as it unfolds over time. The model of disclosure decision-making involves several components as part of the decision-making process for the discloser. For example, a potential discloser assesses both *distal* factors such as culture, social network, personality and individual differences, and *proximal* factors such as the influence of self, other, and relationship reasons for disclosure or nondisclosure when deciding whether to disclose. Additionally, *assessment* involves weighing several factors such as the availability of a receiver, a private location in which to disclose, efficacy or one's perceptions of ability to share the information and achieve the desired results (Bandura, 1977), the quality of the relationship with a disclosure recipient, and expectations regarding how the recipient will respond to the disclosure. If, after weighing the various factors, the individual decides to disclose the information to a particular person, s/he makes additional choices regarding message features such as what, where, how, and when to disclose the information. Once the disclosure is enacted, there may be immediate reactions (e.g., behavioral, emotional, and cognitive) by the disclosure

recipient, as well as longer term outcomes for the discloser, disclosure target, and their relationship.

The model of disclosure decision making focuses on a *single* disclosure episode and does not address the disclosure process *beyond* initial disclosure. Greene et al. (2006) explain, however, that disclosure “is a process that unfolds over time-within a single conversation as well as across days, weeks, months, and even years of a personal relationship” (see also Dindia, 1998, 2000; Greene et al., 2003). Thus, the ongoing nature of disclosure is implied but not explicated in the model. One of the strategies for revealing secrets, for example, involves *incremental disclosures* in which individuals reveal small pieces of sensitive information to gauge another’s reactions (Afifi & Steuber, 2009; see also Petronio et al., 1996). Similarly, after disclosing a piece of information, such as a diagnosis, an individual may avoid discussing new symptoms or providing health condition updates to the disclosure recipient (Greene, 2009). Thus, for individuals managing chronic illnesses, disclosure to a partner about a health condition may vary in depth, breadth, and frequency depending on a partner’s responses to prior disclosures (e.g., support).

*Tests of the theory.* The model of disclosure decision making is a large framework, making it difficult to test in its entirety. Consequently, only aspects of it have been tested to date. Such studies have investigated, for instance, the *assessment of current situation* component such as the role of stigma on disclosing HIV/AIDS status (e.g., Derlega et al., 2000; Derlega et al., 2004; Greene, 2000; Greene et al., 2003), the role of anticipated response (e.g., Greene & Faulkner, 2002; Greene & Serovich, 1996;

Vangelisti et al., 2001), and the role of relational closeness on decisions to disclose (e.g., Venetis, Greene, Banerjee, & Bagdasarov, 2008b).

*Summary.* Greene et al.'s model of disclosure decision-making focuses primarily on the *process* of disclosure “in a single episode” (p. 414). Whether relationships develop in a generally linear process via increasing depth and breadth of disclosure (Altman & Taylor, 1973), or whether people control the “ebb and flow” of their private information (e.g., Altman et al., 1981), and adjust their privacy boundaries through disclosure (e.g., openness versus closedness), Greene et al. argue that there are numerous distal and proximal factors influencing people's disclosure decisions. Moreover, Greene et al. acknowledge that disclosure evolves over time as people evaluate their own and others' needs, expectations and future disclosures.

Although there may be specific steps involved in disclosure decision-making, one must consider whether disclosure is strictly a linear process as depicted in both the DDM (Omarzu, 2000) and the model of disclosure decision-making. That is, do the steps depicted in the models truly represent the disclosure process? Only continued empirical testing will provide answers. More relevant to the present study, however, is Greene's (2009) model of *health* disclosure decision-making (DD-MM) which explicates more clearly the factors people weigh in decisions to share health information.

#### *Model of Health Disclosure Decision-Making (DD-MM)*

The DD-MM expands several components of Greene et al.'s (2006) model of disclosure decision-making and seeks to integrate existing frameworks and research on disclosure processes (p. 227). Disclosure uncertainty is the foundation of the DD-MM, as individuals manage uncertainty regarding the information, the relationship, and efficacy

when deciding whether or not to enact disclosure. The DD-MM argues that health disclosure decision-making is a process in which disclosures are encouraged or discouraged based on assessment of three factors. First, individuals *assess information*, such as a new health diagnosis, in terms of five aspects including stigma (e.g., HIV/AIDS diagnosis), preparation (e.g., expected or unexpected), prognosis (e.g., acute or chronic), symptoms (e.g., visible or nonvisible), and relevance to others (e.g., communicable or noncommunicable). The five parts are likely interrelated but are not intended to be an ordered process (p. 229). Rather, one or two may be relevant at any one time. A person newly diagnosed with heart disease, for example, may evaluate *symptoms* related to the diagnosis (e.g., shortness of breath, fatigue) and *prognosis* (e.g., likelihood of a heart attack) before sharing the information with friends and extended family members.

After assessing the information, the next factor is to *assess a receiver* in terms of relational quality (closeness/intimacy) and anticipated response (e.g., support, relational consequences). However, a proposed revision of the DD-MM (Greene et al., 2010) argues that relational quality acts independently in the model and predicts anticipated response. Thus, after evaluating the information and their relationship with a potential receiver, and if the assessed risk is not too great, individuals will assess the receiver in terms of anticipated reactions or “how a receiver might respond or react to the shared information” (Greene, 2009, p. 229). A receiver may provide needed support (e.g., instrumental, emotional) but there could also be relational consequences (e.g., decreased intimacy).

Finally, if disclosure is still favorable after evaluating anticipated response, individuals will assess *disclosure efficacy* or their ability to share a specific piece of



information with a particular person as a final step in the process. If assessment is not favorable, a person may decide not to disclose at that particular moment but may do so at some point in the future. A person planning to share a cancer diagnosis with a friend, for instance, may feel inarticulate “in the moment,” but may regroup and choose to disclose at a later point in time (Greene, 2009, p. 242).

While Omarzu’s (2000) DDM is most relevant for disclosures in new relationships, for initial disclosure, or for strategically-planned situations, the DD-MM can be used to predict decisions to disclose that may be more automatic and occurring in a variety of personal relationships (e.g., developing, maintaining, long-standing) and contexts (e.g., planned, unplanned). Of particular interest to the current study is that the DD-MM recognizes uncertainty as an underlying feature of health disclosure decision-making and calls for exploration of how the process unfolds in such situations. A role for uncertainty is not fully explicated, however, and an important next step would be to empirically test how uncertainty surrounding people’s health conditions influences the disclosure process, especially for those managing chronic health conditions.

*Tests of the theory.* Although the DD-MM was developed to examine health disclosure decision-making and conceptualizes assessment of information in terms of five components (i.e., stigma, preparation, prognosis, symptoms, and relevance to others), an initial examination of the DD-MM focused on private information (i.e., not health-related). In that study, Greene et al. (2009) assessed information *valence* similar to prior research (e.g., Afifi & Caughlin, 2006; Afifi & Steuber, 2009; Afifi & Steuber, in press; Caughlin, Afifi, Carpenter-Theune, & Miller, 2005; Vangelisti & Caughlin, 1997; Vangelisti et al., 2001). Findings indicated that many of the paths predicted by the DD-

MM were supported, but the relationships between information valence and the other DD-MM variables were not as hypothesized. For example, information valence did not directly predict disclosure efficacy, and not all of the hypothesized relationships were as predicted. In general, however, the results supported the DD-MM's conceptualization of the disclosure decision-making process in terms of the three key predictors (assessment of information, assessment of a receiver, and disclosure efficacy) for disclosing information. Greene et al. (2009) suggested that continued research is necessary to distinguish which variables contribute to anticipated reactions (e.g., response, outcome) to better understand how anticipated reactions affect disclosure decisions. Additionally, Greene et al. argued that continued research is necessary to better understand the role of disclosure efficacy on disclosure as few studies have explored a role for efficacy in disclosure decision-making (see Afifi & Steuber, 2009). Finally, although Greene et al. (2009) measured assessment of information as information valence, a recent test of the DD-MM (Greene et al., 2010) assessed the five components (stigma, preparation, prognosis, symptoms, and relevance to others) and findings are reviewed in the discussion.

*Summary.* Compared to the model of disclosure decision-making (Greene et al., 2006) the DD-MM provides a more parsimonious framework for empirically testing the factors thought to predict initial disclosure of information, especially in health contexts. Heuristically, the DD-MM is applicable to a wider range of informational (e.g., health, personal, private, secret) and relational (e.g., acquaintances, close friends, long-term relationships) contexts for examining disclosure compared to SPT (Altman & Taylor, 1973) and the DDM (Omarzu, 2000). Moreover, unlike CPM (Petronio, 2002) the DD-

MM provides testable propositions to stimulate theory development and refinement (see Greene et al., 2009; Greene et al., 2010). More such studies are necessary. For example, Greene (2009) argues that uncertainty is at the foundation of decisions to disclose, but does not specify how uncertainty influences the process. Further, although the DD-MM acknowledges that disclosure decision-making is an ongoing process that does not end with initial disclosure, the model explicates only the factors influencing disclosure/nondisclosure. It may be, for example, that there is little difference in initial decisions to disclose information regarding an acute illness (e.g., H1N1 or appendicitis) versus a chronic illness (e.g., diabetes or heart disease) such that individuals in both contexts likely assess the information, a potential receiver, their efficacy, and expected reactions. Disclosure in chronic illnesses, however, continues throughout the trajectory of the illness, while disclosures for an acute illness generally cease once the condition has run its course (e.g., a person recovers from the flu) or a person is treated (e.g., undergoes an appendectomy). Thus, people managing chronic health conditions must make ongoing or habitual decisions regarding what, when, where, why, and to whom to disclose about their health condition, and these decisions are not relevant in the same ways for other types of non-chronic health conditions.

Disclosure in chronic versus acute health contexts may differ in that people managing chronic illnesses are likely to establish patterns of disclosure where they disclose about certain health-related issues but not others (e.g., Goldsmith, 2009) and to certain targets but not others (e.g., Greene, 2000). Reasons for developing specific patterns of disclosure are likely similar to reasons for disclosure/nondisclosure such as a duty to inform a partner about recent test results, while perhaps not disclosing about a

new symptom (e.g., indigestion) to avoid worrying a partner or being belittled or rejected. Further, because disclosure is a dynamic process, especially in the context of chronic illnesses, people continuously assess/reassess a partner's responses to disclosures and a partner's willingness (and ability) to provide support. Thus, although initial disclosure of information regarding acute and chronic health conditions may be similar, health disclosure decision-making regarding a specific event ceases with recovery from the acute illness, while disclosure decision-making in chronic illnesses continues, perhaps until death.

The present study utilizes the DD-MM to test the role of prognosis and symptom uncertainty on disclosure decisions in the context of chronic health conditions. It also explores the dynamic nature of disclosure decision-making by examining the patterns of people's disclosure (i.e., breadth, depth, and frequency) to a partner about a health condition.

#### *Disclosure Models Summary*

Ample research contributed to the theoretical frameworks on self-disclosure and disclosure decision-making explicated thus far. That is, SPT explains how self-disclosure facilitates the development and maintenance of interpersonal relationships. CPM provides an overarching framework for examining how individuals manage private information in their interpersonal relationships. To explain the *process* of disclosing private information, scholars (e.g., Greene et al., 2006; Greene, 2009; Omarzu, 2000) have developed models for empirically testing variables thought to influence decisions to disclose *one* piece of information. Although the emphasis has been on “disclosing” private information, the

theories reviewed are also relevant when considering nondisclosure. The following section will briefly address this concept.

### *Defining Nondisclosure*

Petronio and Durham (2008) argue that although CPM views disclosure as the process of revealing information, revealing is always considered in relationship to concealing private information. That is, “since they are in dialectic tension with each other, the way revealing and concealing take place is through a management system” (p. 310). Further, although nondisclosure may imply the absence of disclosure, or the opposite of disclosure, it can also be conceptualized as a decision “to preserve a more tightly controlled privacy boundary” (Greene et al., 2003, p. 55; see also Petronio, 2002). People’s assessment of information as private/secret, negative/positive, and/or in terms of the DD-MM’s five components (e.g., preparation, prognosis) influences their disclosure decisions. In terms of nondisclosure, people may avoid communicating about certain topics or actively conceal information from specific targets. The next subsections will address conceptualizations of nondisclosure, namely avoidance and secret-keeping.

### *Avoidance*

T. Afifi, Caughlin, and W. Afifi (2007) argued that there are theoretical differences between the notion of nondisclosure and other concepts such as topic avoidance and secrets. Afifi and Guerro (1998) suggested that taboo topics, secrets, and deception are all related to topic avoidance, but topic avoidance is conceptualized as a broader construct. In addition, avoidance involves *strategically* trying not to talk about something or disclose information on a particular topic to another person, or when individuals try to not let another person talk about or disclose information on a particular

topic (Afifi et al., 2007; see also Afifi & Guerrero, 1998; Dailey & Palomares, 2004). Reasons for avoiding communication about certain topics may involve self-protection, relationship protection, partner unresponsiveness, and social inappropriateness (Guerrero & Afifi, 1995a; see also Afifi & Steuber, 2009); (cf. Greene et al., 2006 on reasons for nondisclosure). For example, in a study of self-disclosure in marital relationships, Burke, Weir, and Harrison (1976) found that wives' reasons for avoiding disclosing to their husbands reflected relationship protection (avoid worrying or burdening them with their problems) and partner unresponsiveness (perceptions of husbands as disinterested, unresponsive, or unreceptive to their disclosures). Husbands' reasons for avoiding disclosure to wives reflected both relationship protection and social inappropriateness in that husbands believed that they should not bring home their work problems. In terms of health information, a person managing a chronic disease such as diabetes or heart disease may avoid talking to others about the condition because there is no new (or positive) information to report, because s/he wants to avoid worrying the other (e.g., partner, parent, son/daughter), or because a person is concerned about a health condition affecting his/her relationship with a partner. Thus, people are not constant disclosers, and topic avoidance is a common relational event (Afifi & Guerrero, 1998; see also Baxter & Wilmot, 1985, on taboo topics).

Indeed, topic avoidance has been found in a variety of relationship types such as cross-sex friendships (Afifi & Burgoon, 1998), parent-child relationships (Dailey & Palomares, 2004; Guerrero & Afifi, 1995a, 1995b), stepfamilies (Golish & Caughlin, 2002), and dating relationships (Afifi & Burgoon, 1998; Sargent, 2002). Topic avoidance has been linked to both relational satisfaction (Golish, 2000; Guerrero & Afifi, 1995a;

Sargent, 2002) and marital satisfaction (Finkenauer & Hazam, 2000). Thus, topic avoidance is functional and people have legitimate reasons for avoiding communication about sensitive topics. Goldsmith et al. (2007), for example, found that couples reported numerous reasons for avoiding communicating about cancer-related concerns such as protection, uncertainty about expressing emotions, a desire for privacy, maintaining hope or normalcy, avoiding the unnecessary, and preserving identities and relational qualities. Additionally, spouses of patients with heart disease sometimes avoided talk about lifestyle changes to avoid the appearance of nagging their partners (Goldsmith, Lindholm, & Bute, 2006).

*Summary.* Avoidance is a strategic attempt to prevent discussion about a piece of information. Although there may be theoretical differences between avoidance and nondisclosure (T. Afifi et al., 2007), avoidance is one way that people adjust the openness and closedness of their privacy boundaries (e.g., Derlega et al., 1993; Petronio, 2002). Disclosure decision-making models (e.g., DD-MM) suggest that people assess several factors as part of the decision-making process. Depending on those assessments, a person may avoid disclosure to a potential target at a particular moment and reassess at a later point in time. For example, a person may avoid sharing poor cardiac stress test results with a partner because the partner is managing his/her own stresses from a recent job loss. The notion of topic avoidance suggests that, in order to maintain healthy relationships, individuals must balance the dialectics of disclosure and nondisclosure (e.g., Baxter, 1990; Baxter & Montgomery, 1996; Derlega et al., 1993; Petronio, 2002). Finkenauer and Hazam (2000), for example, found that a balance between disclosure and secrecy predicted marital satisfaction (see also Petronio, 2002; Roloff & Ifert, 2000).

Concealing secrets falls under the umbrella of nondisclosure, but it is conceptually different from avoidance. Literature on secret-keeping will be considered next.

### *Secrets*

Derlega et al. (1993) made a distinction between private and secret information. Private information refers to information (e.g., opinions, beliefs, feelings) that others do not normally know about a person but that a person would be willing to share based on others' need to know. Secrets refer to information that people actively withhold and conceal from others (p. 74). Kelly (2002) argued that secret keepers *deliberately* conceal information because they perceive that other people may have some claim to the hidden information. Further, "people are incredibly mindful when it comes to choosing to reveal or conceal secrets" (Afifi & Steuber, 2009, p. 146; see also Bok, 1984). Thus, secret keeping involves "a degree of intentionality that makes it qualitatively different from nondisclosure" (T. Afifi et al., 2007, p. 64).

Specific reasons why people keep secrets are often linked to particular circumstances. For example, reasons why patients did not reveal secrets to their therapists involved fear of expressing feelings, being ashamed or embarrassed, maintaining loyalty, lack of motivation, and time constraints (Kelly, 2002; see also Kelly, 1998). The stigma of having a health condition such as HIV is one reason why individuals living with the virus sometimes keep it a secret (see Derlega et al., 2000; Derlega et al., 2004; Greene et al., 2003). Vangelisti (1994) found that people keep family secrets to create and maintain intimacy, to build and maintain group cohesiveness, to protect the family structure, and to protect family members from social disapproval or rejection (e.g., illegitimate birth).



Individuals' decisions about keeping or revealing secrets are based on numerous factors, such as cultural preferences, individual differences, personal motivations (see Caughlin, Scott, Miller, & Hefner, 2009; see also Kelly, 2002; Petronio, 2002), perceptions of the hidden information as secret versus private (Kelly, 2002; Petronio, 2002; Vangelisti et al., 2001), and the degree of risk involved in revealing (e.g., Afifi & Steuber, 2009; Derlega et al., 1993). Similar to the previously reviewed disclosure decision-making models (e.g., Greene, 2009, Omarzu, 2000), revealing secrets is a decision-making process involving numerous factors. The next sections will look at two recent models for revealing secrets. Kelly's (2002) model accounts for secret versus private information, while Afifi and Steuber's (2009) model emphasizes assessment of the risks involved in revealing secrets.

*When to reveal secrets.* Kelly (2002) proposed a model for when to reveal secrets in a particular relationship (e.g., boss, spouse, or friend).<sup>3</sup> The first step in the model is assessing whether the hidden information is private or secret (similar to the DD-MM's assess information component). Kelly argues, for example, that a person must consider if the relational partner expects access to the information. Similarly, the DD-MM posits that when assessing whether or not to disclose health information, individuals consider if the information is relevant to a potential receiver. In terms of secrets, if the partner does not expect access, then the information is private (i.e., the partner has no right to know) and the potential discloser may keep it hidden. Conversely, if the partner expects access to the information, then it is a secret, and the second step in the model is to assess whether or not the partner is an appropriate confidant. The evaluation of a potential target is similar to the DD-MM's assess receiver component and CPM's (Petronio, 2002) notion of regulating

one's privacy boundaries. Kelly suggested that if a partner is discreet, nonjudgmental, and not rejecting of the secret keeper, then s/he should reveal the secret to that person (see also Kelly & McKillop, 1996). The third step in the model posits that if the potential confidant is not deemed appropriate but is highly likely to find out the secret information, then the secret keeper should either reveal the information or end the relationship. In the final step, if the likelihood of the partner finding out the information is low, Kelly argued that people should only reveal if they are experiencing internal stress and negative effects (e.g., anxiety, depression, ulcers) of concealing the information, similar to catharsis, a reason for disclosure (e.g., Derlega et al., 1993; Stiles, 1987; see also Stiles, Shuster & Harrigan, 1992).

Kelly's (2002) model has not been tested. Rather, Kelly and colleagues' subsequent research has focused on empirically testing whether health benefits are associated with revealing secrets (e.g., Kelly & Yip, 2006; Macready & Kelly, 2008; Rodriguez & Kelly, 2006).<sup>4</sup> Kelly and Macready (2009) argued, for example, that although there may be health benefits to disclosing (e.g., Lepore, Ragan, & Jones, 2000; Pennebaker & Beall, 1986; Smyth, 1998; see Frattaroli, 2006 for a review) there is no empirical evidence to suggest that concealing information (e.g., a secret) is harmful (e.g., Kelly & Yip, 2006). That is, revealing information to an appropriate target may have health benefits, but concealing information from an inappropriate target does not necessarily lead to health problems. Kelly and colleagues conducted several studies to more clearly explain the health benefits of disclosing.

For example, Macready and Kelly (2008) found that the people who believed that others would be reading their disclosed secrets (essay-read condition) reported greater

health benefits than those who believed that their story would not be read (essay-not-read condition). Kelly and Macready (2009; see also Macready & Kelly, 2008) concluded that disclosing a personal story, secret, or trauma to another person (as opposed to writing it down and having no one read it; cf Pennabaker, 1990) allows individuals to bring closure to the event. Moreover, the revelation reduces physical and psychological symptoms associated with concealing the information from others (see Kelly & Macready, 2009). Results of Kelly and colleagues' research may have implications for the current study. That is, a better understanding of the factors influencing people's patterns of disclosure (e.g., breadth, depth, frequency) about their health condition may provide useful insight into not only how people manage the information surrounding their condition but also how they manage the health condition.

*Summary.* Conditions for revealing secrets are similar to the factors influencing disclosure/nondisclosure of private information such as a newly diagnosed health condition (e.g., Greene et al., 2006; Greene, 2009). That is, people assess the information (e.g., secret, private, stigmatizing), a receiver (e.g., relationship quality, anticipated reactions), and whether or not the person will keep the information private (Petronio & Bantz, 1991; Venetis et al., 2008b; see also Greene, 2009). Similar to CPM (Petronio, 2002), Kelly's work on secrets suggests that people manage their privacy boundaries in terms of revealing or concealing information. However, secret information is deliberately concealed from others who may expect access to the information (Kelly, 2002; Kelly & Macready, 2009), whereas, CPM conceptualizes private information as information that others do not necessarily expect access. While Kelly's model offers steps in determining whether or not to reveal a secret in a specific relationship,<sup>5</sup> Afifi and

Steuber's (2009) risk revelation model (RRM) explicates people's assessment of the risks involved in revealing a secret.

*Revelation risk model.* Afifi and Steuber's (2009) revelation risk model (RRM) argues that people assess the severity of risks involved in revealing secrets to others including perceptions of risk to the *self* (e.g., protection from ridicule, harm), the *relationship* (e.g., protect existing bond), and *other people* (e.g., protect from hurt).<sup>6</sup> Depending on the valence of the secret and evaluation of potential risks, people may be more or less willing to reveal. Additionally, the RRM presumes that *communication* efficacy (Bandura, 1977), or people's belief in their ability to actually communicate information to someone (see Afifi, Olson, & Armstrong, 2005; Afifi & Weiner, 2005; Makoul & Roloff, 1998), is an important component of decisions to reveal secrets (cf. the DD-MM's *disclosure* efficacy). In testing the RRM, Afifi and Steuber (2009) found that the more negative a secret, the greater the risk assessment. Similarly, the DD-MM posits that as a first step in the disclosure process, individuals assess information such as the risk involved in disclosing a stigmatizing health condition (e.g., HIV). Afifi and Steuber found that risk assessment was negatively associated with willingness to reveal, and the strongest path in the model was from risk assessment to communication efficacy. Similarly, Greene et al. (2010) found that assessed severity of symptoms negatively predicted disclosure efficacy for people who reported disclosing health information, as well as for those who had not yet disclosed the information.

The RRM and Greene's (2009) DD-MM share several key components such as information assessment, notions of efficacy (cf. communication versus disclosure efficacy), and disclosure/revelation. The difference in the two models lies in part in

people's perceptions of the piece of information. That is, the RRM explains the decision-making process for revealing *secret* information, while the DD-MM explains decisions to disclose health information that may be secret, personal, private and so on (e.g., Kelly, 2002; Petronio, 2002). Although there are risks inherent to decisions to disclose information, the RRM's specific focus on the risks involved in revealing secrets is less useful for an exploration of uncertainty and subsequent disclosures about one's health condition. However, the RRM's conceptualization of risk assessment focusing on the self, other, and relationship parallels research on reasons for disclosure/nondisclosure of HIV (e.g., Derlega et al., 2004) and sources of uncertainty (Brashers, 2000). Thus, the current study conceptualizes potential sources of uncertainty surrounding people's communication about their chronic health condition as related to the self, partner, and relationship with a partner.

### *Summary*

To this point, the focus of this review has been on disclosure (and nondisclosure) and the disclosure decision-making process. Such research emphasizes sharing one particular piece of information such as a medical diagnosis. Less research has explored factors influencing people's subsequent disclosure decisions, such as those concerning new information or updates regarding one's health condition. Greene's (2009) DD-MM is most useful for this purpose because it specifically focuses on disclosing health information. The DD-MM also proposes that uncertainty underlies the disclosure decision-making process, although its role is not fully explicated in the propositions. A clearer understanding of the role of uncertainty in the disclosure process, such as uncertainty about symptom visibility or disease prognosis, and how those uncertainties

influence people's disclosures to a partner about their health condition is necessary. The next section will examine notions of uncertainty in information management, relationships, and illness, and how they may relate to disclosing about one's chronic health condition.

### *Uncertainty Dimensions*

Uncertainty, the inability to explain or predict a particular phenomenon (Berger & Calabrese, 1975), is a core element in theories of information management. Uncertainty influences people's initial interactions with others in uncertainty reduction theory (URT; Berger & Calabrese, 1975) and intimate interpersonal relationships in theories of relational uncertainty (Knobloch & Solomon, 1999, 2002). The experience of uncertainty in illness influences how people evaluate and incorporate an illness into their lives in problematic integration theory (PI; Babrow, 1992, 1995, 2001, 2007; see also Babrow & Matthias, 2009) and how they cope with uncertainty in uncertainty management theory (UMT; Brashers, 2001, 2007; see also Hogan & Brashers, 2009), the theory of motivated information management (TMIM; Afifi & Weiner, 2004; see also Afifi & Morse, 2009), and in acute and chronic illnesses (Mishel, 1988, 1990). Curiously, theories/models of disclosure have not typically addressed the role of uncertainty in the disclosure process except more broadly through dialectical theories (e.g., Baxter, 1988; Baxter & Montgomery, 1996; see also Petronio, 2002) and assessment of risk/rewards (e.g., Omarzu, 2000). However, disclosure uncertainty is at the foundation of Greene's (2009) DD-MM.

The DD-MM argues that individuals manage uncertainty related to the information (e.g., stigma, preparation, prognosis, symptoms, and relevance to others),

their relationship with a potential disclosure recipient, and disclosure efficacy in determining whether or not to share. The present study's focus is on prognosis and symptom uncertainty in the context of chronic health conditions (e.g., heart disease). In order to better understand how uncertainty influences people's ongoing disclosure with partners about their health condition, the following sections will examine the dimensions of uncertainty in uncertainty reduction theory (Berger & Calabrese, 1975; see also Berger & Bradac, 1982; Berger & Gudykunst, 1991), problematic integration theory (Babrow, 1992, 1995, 2001, 2007), uncertainty management theory (Brashers, 2001, 2007; Hogan & Brashers, 2009), the theory of motivated information management (Afifi & Weiner, 2004), and uncertainty in illness theory (Mishel, 1988, 1990; Mishel & Clayton, 2003). The section begins with defining uncertainty.

### *Defining Uncertainty*

Brashers (2001) posited that “uncertainty exists when details of situations are ambiguous, complex, unpredictable, or probabilistic; when information is unavailable or inconsistent; and when people feel insecure in their own state of knowledge or the state of knowledge in general” (p. 478; see also Babrow, Hines, & Kasch, 2000; Babrow et al., 1998). In illness, uncertainty is the “inability to determine the meaning of illness-related events” (Mishel, 1988, p. 225). Although there are many forms and meanings of uncertainty (Brashers & Hogan, 2009), theorists concur that uncertainty is neither good nor bad but rather, like any other object or event, it must be appraised (e.g., as a threat or an opportunity) (Babrow et al., 1998; see also Lazarus & Folkman, 1984; Mishel, 1988, 1990). Because the focus of the present study is on the role of uncertainty in the health disclosure decision-making process, it is necessary to examine the relationship between

uncertainty and communication. Goldsmith (2009) noted that “communication can be both a source of uncertainty and a resource for managing uncertainty” (p. 27). For example, the ability to communicate to a partner about a chronic health condition such as diabetes or hypertension may facilitate coping with the complexities and unpredictability of managing the condition. There are times, however, when reducing uncertainty about a situation is preferred such as in initial interactions with others, meeting a new health specialist, receiving a diagnosis, or making treatment decisions. Reviewed next is URT (Berger & Calabrese, 1975; see also Berger & Bradac, 1982; Berger & Gudykunst, 1991).

#### *Uncertainty in Uncertainty Reduction Theory*

Berger and Calabrese pioneered the study of communication under conditions of uncertainty in its explanation of how people communicate when they are unsure of their surroundings. The major premise of URT is that when strangers meet, their primary concern is to reduce uncertainty or increase predictability about their own and another's behavior. In its original form, the theory's seven axioms and 21 theorems focused on how uncertainty influenced people's communication in initial interactions. For example, Axiom 1 posits that uncertainty is negatively associated with verbal communication and that individuals seek information through communication behaviors (Axiom 3) such as asking questions and self-disclosing in order to predict the others behavior for possible future interaction.

Berger (1979) and Berger and Bradac (1982) elaborated on uncertainty reduction theory and proposed a further conceptualization between cognitive and behavioral uncertainty. Cognitive uncertainty involves uncertainty people have about their own and



others' beliefs and attitudes; behavioral uncertainty refers to the ability to predict behavior in specific circumstances. Although numerous tests were conducted on at least some of the axioms (e.g., Clatterback, 1979; Gudykunst & Nishida, 1984; Parks & Adelman, 1983), Sunnafrank (1986) argued that there was weak support for the variables examined and he suggested several modifications to URT.

*Theory extensions.* Sunnafrank (1986, 1990) proposed a predicted outcome value (POV) perspective as a reformulation of URT which suggested that goals for communicating are to maximize relational outcomes and rewards in anticipation of future interactions, not necessarily to reduce uncertainty. That is, when positive outcomes are predicted, individuals increase their communicative attempts in initial interactions in an attempt to establish future contact. On the other hand, Sunnafrank (1986, 1990) argues that communication is likely to decrease when negative predicted outcomes materialize. Although POV is about communication, in general, and not disclosure, the notion of predicted outcomes can be compared to the DD-MM's (Greene, 2009) anticipated response variables (e.g., support, relational consequences), the DDM's (Omarzu, 2000) subjective utility, and the RRM's (Afifi and Steuber, 2009) risk assessment variables such that individuals assess the risks involved in disclosing information in relationships. For example, the DD-MM posits that negative assessment of information and/or a receiver may result in decreased disclose efficacy and nondisclosure, while negative assessment of subjective utility and subjective risk of disclosing as proposed in the DDM may also result in nondisclosure. Additionally, negative assessment of the risks involved in disclosing secrets results in decreased communication efficacy and willingness to reveal a secret. POV is related to uncertainty because reducing uncertainty in initial

interactions increases people's perceptions of perceived outcomes for the relationship. Berger (1986) argued against reformulating URT to include POV, however, suggesting that predicted outcome values are among the many behaviors people enact in order to reduce uncertainty in initial encounters.

Both URT and POV are communication theories about how uncertainty influences people's communication in new situations. As such, they are less useful for a study of people in existing relationships. The theories can be compared, however, to the risks and rewards (and uncertainty) associated with self-disclosure in many theories (e.g., Afifi & Steuber, 2009; Greene et al., 2006; see Derlega et al., 2008b). Moreover, uncertainty is an underlying feature of disclosure decision-making (Greene, 2009). Research on disclosing HIV status, for example, indicates that people's reasons for disclosure such as a duty to inform, or a desire to educate, have uncertainty implications (Derlega et al., 2000; Derlega et al., 2004; see also Greene et al., 2003). A disclosure recipient, for instance, could end the relationship after receiving disclosure of a person's HIV diagnosis.

For people managing chronic illnesses, sharing health condition updates with a partner may be a way to reduce one's uncertainty about symptoms or disease progression (a reward) but may simultaneously increase a discloser's uncertainty about the extent to which the condition is interfering with a discloser's daily activities (a risk). Relevance for the present study is that we do not know how people weigh these uncertainties. Berger's (1997) work on strategic communication (e.g., plans and goals) may be particularly relevant for understanding how illness uncertainty influences communication about chronic health conditions.

Berger (1997; see also Berger, 2008) proposed a theory of strategic communication to explain how mental plans influence one's communication. Berger (1997) defined plans as "hierarchical cognitive representations of goal-directed action sequences" (p. 25). When people have goals to attain, they derive plans from either long-term memory or current information sources. "Canned plans" are those that have either been enacted numerous times or mentally rehearsed in the past (p. 26). For example, a couple who talk about their daily activities over breakfast each morning may be accomplishing a goal of maintaining intimacy. Their established routine may be interrupted or changed, however, if one partner is diagnosed with diabetes and must check his/her blood sugar levels each morning. Moreover, a newly diagnosed person may have to tell people that s/he has a particular health condition and cannot eat specific foods or perform certain activities. Individuals may experience an emotion such as anxiety when an interruption of some ongoing activity has occurred (Berscheid, 1983; Izard, 1991; see also Mandler, 1975). Berger argues that people may be forced to alter their plans or build contingencies into their plans as a way of coping with uncertainty (Berger, 1997, 2008). When communicating with a partner about a health condition, for example, a person may have a simple plan for reporting general information related to one's health condition (e.g., "I tell her everything") but may devise a more complex plan for talking about intimate topics (e.g., "I don't talk about the things that upset her"). Thus, Berger's (1997) theory of strategic communication is useful for understanding that when people's goals for communication are interrupted they may be forced to alter their plans or create new ones. Although the theory focuses on communication in general and not disclosure, per se, the notion of goals and plans can be compared to decisions to disclose information

(e.g., Greene, 2009; Omarzu, 2000) or reveal secrets (e.g., Afifi & Steuber, 2009; Kelly, 2000) such that people assess information, a receiver, and the risks and benefits associated with disclosing information. Based on those assessments individuals may change their plans to disclose/reveal and possibly reassess at a later point in time.

What is similar about URT, POV, plan-based theory, as well as disclosure theories (e.g., Afifi & Steuber, 2009; Greene et al., 2006; Greene, 2009; Omarzu, 2000) is that uncertainty shapes initial interactions and initial disclosures, as well. What is less clear from the theories is how uncertainty influences patterns of disclosure such as the depth, breadth, and frequency for people in *existing* relationships, especially those managing chronic health conditions. When a person is uncertain about disease prognosis, for example, s/he may have many reasons to avoid disclosing about it with a partner. Yet, uncertainty about a new or unusual symptom that may or may not be related to one's health condition could compel a person to disclose more in-depth or more frequently with a partner in order to determine what a person should do (e.g., call a physician, go to the emergency department). Moreover, a person may opt to avoid disclosure about a health condition altogether.

*Summary.* Continued URT research determined that uncertainty does not necessarily cease once we get to know a person, but rather it may reappear, for example, via uncertainty-increasing events within friendships (e.g., Afifi & Burgoon, 1998), dating relationships (e.g., Knobloch & Solomon, 2005; Planalp & Honeycutt, 1985; Planalp, Rutherford, & Honeycutt, 1988), physician-patient relationships (Gordon, Joos, & Byrne, 2000), working relationships (Kramer, 1999), and marital relationships (Knobloch, 2008; Turner, 1990). That people encounter uncertainty in numerous contexts suggests that it is

not always associated with negative emotions and outcomes (e.g., Goldsmith 2009). Rather, as Berger and Bradac (1982) noted “our uncertain knowledge of self and other waxes and wanes during the life of a relationship” (p. 115). Moreover, people experience relational uncertainty. Next, research examining the role of relational uncertainty as depicted in the relational turbulence model (RTM; Knobloch & Solomon, 2004; Solomon & Knobloch, 2004) will be reviewed.

### *Relational Uncertainty*

Relational uncertainty is the degree of confidence people have in their perceptions of involvement within interpersonal relationships (Knobloch & Solomon, 1999, 2002; Knobloch et al., 2001; Solomon & Knobloch, 2001; see also Berger and Bradac, 1982). Some doubts people have related to their relationships stem from three interrelated sources: 1) *self uncertainty* refers to doubts that people have about their own involvement in a relationship (e.g., how committed a person is to the relationship); 2) *partner uncertainty* refers to doubts that people have about their partner’s involvement in a relationship (e.g., how committed a person thinks his/her partner is to the relationship); and 3) *relationship uncertainty* refers to doubts about the viability of a relationship as a whole (e.g., whether a person believes the relationship will last). Although self and partner uncertainty refer to questions about individuals, relationship uncertainty exists on a higher of abstraction because it concerns the dyad (Knobloch & Satterlee, 2009). Thus, the sources of relational uncertainty are similar to the previously discussed reasons for disclosing information that tend to be self, other, and relationship-focused (e.g., Derlega et al., 1993). Relational uncertainty is a key component of Solomon & Knobloch’s (2004) model of relational turbulence (RTM) which was developed to explain the turmoil that

people encounter in the transition from casual dating to serious commitment. Perceptions of a partner's interference that result from negotiating interdependence within a dating relationship is another key RTM parameter.

Relevance for relational uncertainty and the present study is how the experience of relational uncertainty influences people's communication which may provide support for predictions about the influence of uncertainty on disclosure decision-making, especially patterns of disclosure. For example, research has linked the experience of relational uncertainty to communicative outcomes such as avoiding discussion of sensitive subjects within cross-sex friendships (Afifi & Burgoon, 1998), dating relationships (Knobloch & Carpenter-Theune, 2004), and family relationships (Afifi & Schrodt, 2003). Doubts about romantic involvement are associated with more indirect communication (e.g., Knobloch, 2006; Theiss & Solomon, 2006b) and date request messages are less affiliative, relational-focused, and less explicit when experiencing relational uncertainty (Knobloch, 2006). Additionally, relational uncertainty has been shown to affect partners' reactions to various relationship phenomena, such as more intense reactions to appraisals of irritations (Solomon & Knobloch, 2004; Theiss & Solomon, 2006b), jealousy (Knobloch et al., 2001; Theiss & Solomon, 2006a), and the experience of hurt in romantic relationships (Theiss, Knobloch, Checton, & Magsamen-Conrad, 2009).

*Relational uncertainty extensions.* Recent literature has widened the focus of relational uncertainty on dating relationships to encompass the experience of relational uncertainty in longer-term relationships such as marriage (Knobloch, Miller, Bond, & Mannone, 2007; Knobloch, 2008) and has examined the experience of relational

uncertainty and partner interference in health contexts (e.g., Steuber & Solomon, 2008). Knobloch (2008), for example, identified uncertainty-provoking themes in marriage and found that uncertainty about *health and illness* emerged as one of the 12 content areas of most concern to spouses. Two recent studies utilized the RTM (Knobloch & Solomon, 2004; Solomon & Knobloch, 2004) to examine how uncertainty influences people's identities and roles as they manage infertility (Steuber & Solomon, 2008) and breast cancer (Weber & Solomon, 2008).

For example, Steuber and Solomon (2008) explored the issues relevant to people facing reproductive difficulties by examining discussion boards and blogs for personal accounts of infertility experiences. The analysis identified both topical themes and themes consistent with the parameters of the relational turbulence model (i.e., relational uncertainty and partner interference). Two themes emphasized the experience of relational uncertainty: *relational invalidation* (e.g., confusion about partners' priorities) and *implications of blame* (e.g., directing emotions toward each other). Interference from a partner, a second relational turbulence parameter, surfaced when infertility dominated people's daily life and/or sexual intimacy or when expectations for treatment involvement were violated (e.g. refusal to try in-vitro fertilization). Two peripheral themes also emerged. *Identity development* suggested that there were benefits for some couples who were able to persevere through the difficulties of the infertility experience. This finding is consistent with the notion that at times people come to see and accept uncertainty as a basic feature of existence (see Babrow & Mattias, 2009; Mishel, 1990). For example, acceptance of infertility may be an important point in some couples' relationship. Additionally, some couples experienced *strengthened relational identity*

which instilled the feeling of having to “work harder” for their baby and constituted a “we” orientation. Similarly, in a study of heart failure patients and their spouses the use of “we” talk by a spouse, but not the patient, was a better predictor of positive change in the patient’s heart failure symptoms and general health over the next six months than were self-report measures of marital quality and coping (Rohrbaugh, Mehl, Shoham, Reilly, & Ewy, 2008).

Steuber and Solomon (2008) suggest two gaps in the RTM. First, although the relational turbulence model positions relational uncertainty and interference as distinct mechanisms, their analysis suggests that they may be closely linked during turbulent periods. For example, feelings of relational uncertainty and blame were experienced by one partner after the other partner interfered in a pregnancy-related goal (e.g., inability to adhere to prescribed sexual activity), suggesting that the parameters may, at times, occur sequentially. Similarly, a person managing a chronic illness might experience uncertainty about prognosis which then leads to perceptions that the illness interferes in the person’s and his/her partner’s life. A second gap in the RTM points to identity development as another mechanism that may be relevant during transitions within romantic relationships. The notion of identity development can be compared to probabilistic and evaluative orientations as described in problematic integration theory (see Babrow, 2007; Babrow & Matthias, 2009) and Mishel’s (1988, 1990) notion of “probabilistic thinking” in which people managing chronic illnesses accept uncertainty as part of the “natural rhythm of life” (Mishel & Clayton, 2003, p. 31).

Using a similar method, Weber and Solomon (2008) utilized both RTM and communication privacy management theory (Petronio, 2002) in a qualitative study of



breast cancer patients/survivors and their families. Specifically, Weber and Solomon analyzed discourse from message boards, weblogs, and chat rooms to explore personal relationships and boundary issues in the sources of distress associated with the experience of breast cancer. Five themes emerged which encompassed parameters from RTM (i.e., relational uncertainty and interference from partners) and communication issues. The first theme, integrating old and new identities, is similar to Steuber and Solomon's (2008) identity development theme and suggests that women struggle to reconcile their "before" and "after" breast cancer identities. Similarly, following one partner's experience with an acute cardiac event, couples reported the sense of "a failed body" and a "call to change" (Mahrer-Imhof, Hoffmann, & Froelicher, 2007). A second theme, *managing information*, has implications for the present study in that sharing information was found to be a source of uncertainty. There are times when managing their own and the other's information needs interfere with women's coping strategies (e.g., waiting for tests results, making treatment decisions). Third party disclosure is when people share information that is not their "own" (Greene, 2009). For example, Weber and Solomon reported about one father who agonized over having to tell his young children about their mother's breast cancer diagnosis. A third theme is consistent with studies of privacy management (e.g., Petronio, 2002) and disclosure (e.g., Greene et al., 2006; Greene, 2009). For example, CPM helps explain the finding that although family members and friends are a source of support for women during a breast cancer diagnosis, at times *co-owning* the cancer experience is a source of relational and communicative tension. Uncertainty about the effects that a breast cancer diagnosis has on friends and family members creates a barrier to sharing the information. Similarly, the DD-MM's (Greene, 2009) assessment of

receiver component argues that individuals assess the quality of a relationship with a potential target, as well as a person's anticipated response (e.g., support, consequences for the relationship) to a health disclosure, such as sharing a breast cancer diagnosis.

Weber and Solomon concluded that although relational uncertainty permeated the five identified themes, there were fewer instances of relationship partners interfering in everyday goals and activities. Thus, the experience of relational uncertainty played a more prominent role than did partner interference. Indeed, the researchers propose that future research should consider illness uncertainty (e.g., Brashers, Neidig, & Goldsmith, 2004) as a salient dimension of the breast cancer experience along with relational uncertainty. Taken together, the two studies (Steuber & Solomon, 2008; Weber & Solomon, 2008) contribute to our understanding of how interpersonal relationships and communication can shape the illness experience. Future research, however, should incorporate the three uncertainty dimensions, namely self, other, and relationship uncertainties. For example, exploring self-focused, partner-focused, and relationship-focused uncertainties that people experience related to a health condition such as doubts about symptoms, or disease prognosis, may provide important information about how the dimensions of illness uncertainty influence communication about a health condition in the context of a relationship (see also Brashers, 2001; Mishel, 1988, 1990).

*Summary.* The RTM has been used extensively to examine the role of relational uncertainty and partner interference in various relationships and contexts. The experience of relational uncertainty has been shown to influence people's communication and can thus be utilized to examine the experience of illness uncertainty and its effect on people's communication. Similarly, the experience of illness uncertainty can inform studies of

relational uncertainty in health contexts. Indeed, a recent application of RTM (Weber & Solomon, 2008) calls for further examination of illness uncertainty in conjunction with relational uncertainty for women managing breast cancer. What is missing from the RTM, however, may be a role for efficacy in people's communication. That is, people may experience uncertainty in their relationship and interference from a partner, but not feel able to talk to the person about their concerns. Recent studies of disclosure indicate that it plays a strong role in people's likelihood of disclosing personal information (e.g., Greene et al., 2009), health information (e.g., Greene et al., 2010), and willingness to reveal a secret (e.g., Afifi & Steuber, 2009).

### *Summary*

The uncertainty literature just reviewed demonstrates that the experience of uncertainty continues to influence people's communication beyond initial interactions with others (e.g., Afifi & Burgoon, 1998). Relational uncertainty, for example, appears to be a salient component in numerous contexts such as dating (e.g., Knobloch & Carpenter-Theune, 2004), marital (e.g., Knobloch et al., 2007) and health (e.g., Weber & Solomon, 2008). Uncertainty alters people's goals and plans (Berger, 1997, 2008) and influences people's communication (e.g., Knobloch, 2006; Theiss & Solomon, 2006b).

Researchers tend to agree, however, that *reducing* is only one response to uncertainty. That is, people are often motivated to create and maintain uncertainty (Smithson, 2008), to manage uncertainty (Brashers, 1999, 2001; see also Afifi & Weiner, 2004), or prefer "being with uncertainty" as Babrow and Mattias suggest (2009, p. 22). Because uncertainty is complex, theorists have developed approaches to uncertainty such as problematic integration theory (PI; Babrow, 1992, 1995, 2001, 2007; Babrow &

Matthias, 2009) uncertainty management theory (UMT; Brashers, 2001, 2007; Hogan & Brashers, 2009), the theory of motivated information management (TMIM; Afifi & Morse, 2009; Afifi & Weiner, 2004), and uncertainty in illness theory (Mishel, 1988, 1990). Examined first is problematic integration theory.

### *Problematic Integration Theory*

Problematic integration theory (Babrow, 1992, 1995, 2001, 2007; Babrow & Matthias, 2009) posits that people form probabilistic and evaluative orientations to their experiences. For example, in the case of heart disease probabilistic orientations arise as individuals consider their likelihood of having a heart attack, of being diagnosed early in the disease progression, of obtaining appropriate treatment, and so on. These probabilistic orientations are flexible, changing from lesser to greater perceived likelihood (or vice versa) in light of ongoing encounters with relevant information (e.g., family members, physicians, print and online sources). Similarly, evaluative orientations arise as a person considers how good or bad it would be to be diagnosed with heart disease, to be diagnosed early in the disease progression, to obtain appropriate treatment, and so on. Such probabilistic and evaluative orientations undoubtedly shape people's disclosure about heart disease both enabling and constraining the messages they formulate as well as interpretations of messages they receive (Babrow, 1992, 1995, 2001, 2007; Babrow & Matthias, 2009).

Additional claims of PI theory are that probabilistic and evaluative orientations must be integrated, but that integrating is often problematic. Babrow (1992; see also Babrow 1995, 2001, 2007) identified four ways in which the integration of probability and evaluation can be problematic: the probabilities and values can *diverge* (e.g.,

situations that cause emotions such as frustration, embarrassment, or anxiety); the probability can be *ambiguous* (e.g., multiple meanings); evaluations can conflict leading to *ambivalence* in the evaluator (e.g., mutually exclusive, similarly unattractive options); and an outcome can be *impossible* (e.g., denotes certainty). Further, uncertainty is a multi-faceted construct and an initially problematic form may be altered into another problematic form. The forms and meanings of uncertainty in PI theory may be conceived as a fundamental characteristic of the world (ontological uncertainty), or as being related to specific information such as quantity, quality, or applicability of information (epistemological uncertainty). For example, a person facing insurmountable odds of surviving a myocardial infarction (i.e., heart attack) may be able to convince her/himself that there is hope. Moreover, s/he must struggle to hold onto that hope or manage to live with some form of uncertainty. Finally, Babrow (2001; see also Babrow, 1995) claims that although communication is integral to the experience of PI and its transformation (e.g., accepting chronic uncertainty), communication itself is frequently a source of PI (e.g., receiving bad news). In summary, PI theory suggests that communication shapes conceptions of our world including its composition, meanings, and its values (Babrow, 2001, p. 556).

*Tests of the theory.* PI theory has been applied to predominantly health contexts such as end-of-life decision-making (Hines, Babrow, Badzek, & Moss, 1997), the management of uncertainty in breast cancer (Cohen, 2009; Ford, Babrow, & Stohl, 1996; Gill & Babrow, 2007), and the experience of uncertainty in pregnancy and childbirth (Matthias, 2009). For example, Ford et al. (1996) conducted a two phase study of women in breast cancer support groups to determine whether social support facilitates the

management of PI. Participants in the first phase read hypothetical scenarios and formulated statements that they thought would be supportive. In a second session participants coded their own responses with the interviewer. Results indicated that two-thirds of the messages were perceived as uncertainty reducing whereas one-third of the messages increased uncertainty. The findings support the assumption that social support messages are intentionally designed not only to decrease uncertainty but also at times to maintain or increase uncertainty.

More recently, Gill and Babrow (2007) applied PI in an interpretive analysis of breast cancer articles in women's magazines. Uncertainty and ambivalence emerged as two major challenges in the discourse. Additionally, imperfect approaches to coping with uncertainty that emerged in the discourse included *simplifications* (e.g., implying that science provides freedom from uncertainty and that freedom from uncertainty is to be prized), *information-seeking/provision* (e.g., writers frequently attempted to reduce uncertainty through information), *affect management* (e.g., women were encouraged to take control of their emotional reactions), *intuition* (e.g., women were encouraged to trust their intuition about their health care), *empowerment* (e.g., endorsing greater self-responsibility and self-advocacy in decision-making processes), *sustaining hope* (e.g., for better treatments and a cure), and *metaphoric reframing* (e.g., using war metaphors such as "battling breast cancer"). Gill and Babrow concluded that although discourse about breast cancer involves often inescapable challenges due to the nature of the disease and current biomedical knowledge, their observations and relevant theory can be used to suggest less problematic, more helpful constructions about breast cancer in popular women's magazines. For example, they suggest that journalists avoid positive or highly

negative introductory statements that may later disappoint their readers. Additionally, authors should avoid oversimplification of a complex disease such as breast cancer to prevent misleading readers. Finally, authors of popular media should avoid promoting an information-seeking or uncertainty reduction approach to breast cancer (see Babrow & Kline, 2000).

Although PI theory has been applied to predominantly health contexts, it has also been applied to contexts such as McPhee and Zaug's (2001) analysis of organizational communication theories, and Shi and Babrow's (2007) study of Chinese American identity construction. Shi and Babrow (2007), for example, used problematic integration (PI) theory as a general perspective on the relationship between communication, mind, and meaning in the study of Chinese Americans' identity construction. The researchers conducted in-depth interviews with 10 adolescent and young adult Chinese Americans in order to provide cohesive and penetrating insights into participants' "fluid, often turbulent sense of their bicultural selves" (p. 317). Findings indicated that most of the adolescents struggle more with the value of a simple, singular identity (whether Chinese or American), whereas the young adults appeared to have achieved a more complex hybrid identity. However, rather than being consistent, participants' self-conceptions underwent change within the interview itself. For example, self-conceptions arose and dissolved depending on the particular issue under discussion at a particular moment during conversation. Shi and Babrow concluded that the respondents' identities were quite dynamic; the dynamics followed arcs of problematic integration and tentative, provisional discursive resolutions of these problematics within the ongoing conversation by which they described their life and self.

*Summary.* PI theory is useful for understanding the numerous dimensions of uncertainty and how people orient to and evaluate the uncertainty that accompanies the management of a chronic health condition. Similar to CPM (Petronio, 2002), PI is a large framework with demonstrated heuristic ability. However, as Bradac (2001) stated, “PI theory offers few specific predictions or prescriptions” but rather suggests general ideas about a range of possibilities (p. 570). Moreover, although research to date has applied PI to numerous contexts, like CPM (Petronio, 2002), empirical testing is an important next step in terms of continued theory development and refinement. The next section will turn to the work of Brashers (2001) which closely followed PI theory.

#### *Uncertainty Management Theory*

UMT connects and extends several theories including Mishel’s (1988, 1990) uncertainty in illness theory, Babrow’s (1992) problematic integration theory, Berger and Calabrese’s uncertainty reduction theory (Berger, 1987; Berger & Bradac, 1982; Berger & Calabrese, 1975), and Lazarus and Folkman’s (1984) stress, appraisal, and coping theory. Additionally, UMT “was developed to understand communication processes in the management of illness-related uncertainty” (Hogan & Brashers, 2009, p. 45).

Uncertainty in UMT is defined as occurring “when people feel insecure in their own state of knowledge or the state of knowledge in general about a topic” (Brashers, 2001a, p. 478). Uncertainty, thus, is about people’s self-perceptions. That is, “a person who believes himself or herself to be uncertain is uncertain” (p. 478). People experience uncertainty variously, not simply as an uncomfortable tension demanding reduction, and sometimes people choose to avoid or not attempt to seek information to decrease their uncertainty (Babrow et al., 2000; Babrow et al., 1998; Brashers, Neidig, Cardillo, Dobbs,



Russell, & Haas, 1999; Brashers, Neidig, Haas, Dobbs, Cardillo, & Russell, 2000). UMT also addresses questions about the sources and forms of uncertainty. For example, for people living with HIV/AIDS the experience of uncertainty stemmed from *medical* (insufficient information about diagnosis), *personal* (complex roles, unclear financial consequences), and *social* (unpredictable interpersonal relationships, unclear relational implications) sources (Brashers et al., 2003). In addition, Brashers et al. (2003) addressed the functions of appraisal and emotions in managing uncertainty (e.g., positive, negative, and neutral responses) and the range of behavioral and psychological responses to uncertainty (e.g., reducing, maintaining, increasing, or adapting).

Of particular interest for the present study is Brashers' (2001; see also Babrow, 2001) notion that uncertainty is a multi-layered phenomenon in which people experience various types of uncertainty simultaneously. Brashers (2001) noted that the experience of uncertainty may influence the *self* (e.g., one's own beliefs, values, abilities), *others* (e.g., other's beliefs, values, abilities), and *relationships* with others (e.g., relationship quality, strength). For example, people with chronic health conditions such as heart disease may experience uncertainties about disease prognosis focusing on the *self* (e.g., unknown future physical limitations), *other* (e.g., a partner's concerns about one's future limitations), and the *relationship* (e.g., how one's heart condition will affect the relationship in the long run).

*Tests of the theory.* Much of Brashers' and related research testing UMT has centered on how people manage the uncertainty associated with an HIV diagnosis (e.g., Brashers, Hsieh, Neidig, & Reynolds, 2006; Brashers et al., 2004; Brashers et al., 1999; Brashers et al., 2000; Brashers et al., 2003). For example, Brashers et al. (2000)

conducted focus group interviews with people living with HIV or AIDS and found that individuals used information seeking and avoiding for increasing, reducing, or maintaining their uncertainty depending on how uncertainty was appraised (i.e., as danger or opportunity). When uncertainty was appraised as a *danger* participants reported managing uncertainty through active information seeking (e.g., soliciting information from various sources), passive information seeking (e.g., their associations with similar others), and through attaining experiential information (e.g., becoming more familiar with symptoms and side effects). On the other hand, when uncertainty was appraised as an *opportunity*, individuals experienced positive emotions such as hope and optimism and engaged in both information avoidance to maintain uncertainty (e.g., forgoing HIV testing to avoid confirming diagnosis) and information seeking to (e.g., alternative therapies or medications) to increase their uncertainty and thereby sustain the belief that there may be something else available to treat/cure them. Specifically, participants reported avoiding information to maintain their uncertainty. Relevance for the present study is that when uncertainty in Brashers et al. (2000) was appraised as a *chronic condition*, participants' emotional responses ranged from relief to acceptance and influenced how they managed their uncertainty. Acceptance of chronic uncertainty, for example, allowed participants to refocus their day-to-day activities or adjust their decision-making (e.g., looking 2-3 years ahead rather than 5-10 years).

How people assess and manage uncertainty in chronic illness can be compared to a POV perspective (Sunnafrank, 1988, 1990) in which people evaluate the costs and rewards of future interaction with a particular other. POV posits that a person will increase his/her communicative attempts (and decrease uncertainty) when s/he perceives

positive predicted outcomes from future interaction. For example, in a study of social network members of people with communicative disorders due to disease or injury (e.g., stroke, dementia, head trauma), Donovan-Kicken and Bute (2008) found that the network members experienced uncertainty not only about the person's brain injury/disease, but about how to communicate with the ill person. The friends and family members were able to manage their uncertainty by seeking information about the illness or injury, by changing the mechanics of how they communicated with the person (e.g., asking questions with a yes/no response), or by accepting or maintaining their uncertainty.

UMT has also been cited in research contexts such as couples coping with serious illness (Goldsmith, 2009), long distance relationships (Maguire, 2007), and organizational communication (Deumes, 2008). Additionally, although UMT research to date has focused primarily on information *acquisition* (i.e., information seeking) behaviors, Hogan and Brashers (2009) argue that continued research should investigate information *handling* and *use* behaviors to help clarify and expand the role of information in UMT. Information handling behaviors refer to how people "keep" their information (e.g., "personal information collections"), while information *use* behaviors focus on how people process information or what they *do* with information. For instance, how do people manage uncertainty when faced with new information regarding a chronic health condition such as an abnormal stress test? Does a person initiate immediate discussion with one's partner, avoid disclosing the information, or plan a specific time in which to share the information, such as over dinner with a glass of wine? In a recent study, Choi et al. (2010) found that people who felt confident about revealing negative and stigmatized information were less likely to plan their disclosure. Taking more effort to plan self-

disclosure, however, led to scheduling a specific time to disclose the information. Several theorists might argue that decisions to disclose depend on one's self-efficacy (e.g., Bandura, 1977; Makoul & Roloff, 1998), communication efficacy (e.g., Afifi & Weiner, 2004; T. Afifi & Steuber, 2009), or disclosure efficacy (e.g., Greene, 2009). That is, individuals' perceptions of their ability to perform a behavior such as disclose personal information or reveal a secret, have been shown to be strong predictors of likelihood of enacting the behavior (Afifi & Steuber, 2009; Greene et al., 2009). We know less, however, about how uncertainty influences disclosure decision-making. Thus, the present study examines how illness uncertainties associated with chronic health conditions influence people's efficacy and patterns of disclosures related to their condition. The following section will briefly examine the notion of uncertainty and various types of efficacy as depicted in the theory of motivated information management (TMIM; Afifi & Weiner, 2004).

### *The Theory of Motivated Information Management*

The theory of motivated information management (Afifi & Weiner, 2004; see also Afifi & Morse, 2009) proposes that people begin the process of information seeking when there is a felt discrepancy between desired and actual uncertainty about a salient issue, which then leads to uncertainty-related anxiety. Motivation to reduce the anxiety leads to assessment of various information-management strategies to achieve that end. TMIM posits that the information management process involves three phases: *interpretation*, *evaluation* and *decision*. Rather than viewing uncertainty as a perennially negative state, Afifi and Weiner (2004) argue that individuals may perceive uncertainty

as a positive state and should be considered “uncertainty managers, not uncertainty reducers” (Afifi & Weiner, 2004, p. 173).

TMIM also extends Bandura’s (1977) concept of efficacy by distinguishing among three types: *coping efficacy*, *communication efficacy*, and *target efficacy*. Afifi and Weiner (2004) proposed that information-seekers enact *coping efficacy* to assess whether they can manage expected outcomes; *communication efficacy* allows individuals to assess whether they have the communication skills necessary to seek information; and *target efficacy* helps individuals assess whether the target has the ability and honesty to provide the needed information. The DD-MM’s (Greene, 2009) anticipated reactions component in which individuals estimate the likely response of a potential receiver before deciding to disclose is similar to TMIM’s target efficacy. Additionally, the DD-MM’s disclosure efficacy is a more specific form of communication efficacy.

In sum, TMIM proposes that efficacy assessments are, in part, a function of *outcome assessments*, defined as “expectations for the perceived outcomes of various actions prior to strategy selection” (Afifi & Weiner, 2004, p. 176). Outcome assessments include *outcome expectancies* such as costs and benefits derived from expectancy-value models (e.g., Sunnafrank, 1986, 1990), and *outcome importance* for the self and/or relationship similar to risk/benefit assessments seen in other models (e.g., Afifi & Steuber, 2009; Greene et al., 2006). Further, TMIM posits that efficacy serves as a partial mediator of the effects of outcome assessments on individuals’ information-management decisions (see also Afifi & Steuber, 2009; Greene et al., 2009).

*Tests of the theory.* Empirical tests of TMIM have resulted in support for some components but not others. For example, Afifi, Dillow, and Morse (2004) applied the

TMIM to the process of information management in close relationships. In this two-part study, Afifi et al. (2004) asked 222 participants to describe something that their relational partner did or said about which they wanted more information. TMIM variables measured in the two surveys (conducted three weeks apart) included importance of the issue, uncertainty discrepancy, uncertainty discrepancy anxiety, outcome expectancies, efficacy (coping, target honesty, communication), information-seeking indices, and relationship commitment. The follow-up survey was similar to the first except individuals were not asked to describe an event and a measure was added to assess *event related information management activity* occurring between the first and second survey. Similar to the RRM's (Afifi & Steuber, 2009) assessment of risk of revealing a secret, results indicated that direct information seeking about issues for which the seeker expects negative outcomes may be detrimental to relationships, while information seeking when one expects positive outcomes seems to have no effect on short-term commitment. Additionally, results demonstrated that communication efficacy and target efficacy predicted participants' information seeking, but coping efficacy failed as both a component of efficacy and as a separate predictor of information management. Moreover, communication efficacy was a strong predictor of directness of information seeking. For example, Afifi et al. (2004) found that individuals who believed they could talk to their partner productively about the issue were more likely than others to do so. The finding is echoed in subsequent studies of disclosure decision-making such that efficacy positively predicted likelihood of disclosing personal information (Greene et al., 2009), health information (Greene et al., 2010), and willingness to reveal a secret (Afifi & Steuber, 2009).

Afifi and Weiner (2006) found similar results for TMIM's efficacy components in their longitudinal investigation of college students' information-seeking behavior in relation to a target person's sexual health. TMIM variables (e.g., anxiety about uncertainty discrepancy, outcome expectancies, efficacy, and information-seeking strategies) and sexual behavior were measured at Time 1 and Time 2. Findings indicated mixed success for the TMIM framework. For example, the uncertainty discrepancy variable worked as predicted and supported the utility of TMIM as a predictor of information-seeking behavior in an applied context. However, other TMIM components, such as outcome expectancy and the three efficacy types (i.e., coping, communication, target) did not operate as predicted. Low communication efficacy belief, for example, resulted in a failure in direct information seeking. Conversely, individuals higher in communication efficacy were able to gather the needed information.

In another study, Afifi et al. (2006) found that communication and coping efficacy, but not target efficacy (excluded due to measurement problems) predicted individuals' willingness to directly discuss organ donation with family members (in Study 1). In Study 2, Afifi et al. measured an information-seeking outcome (i.e., the degree to which individuals sought organ-donation-related information during an interaction), rather than the more general *discussion directness* measured in Study 1. Results of the second study indicated that more positive expectations about interacting with a family member about organ donation were strongly related to the ability to discuss the topic with that family member. Additionally, communication efficacy was positively associated with the degree to which individuals sought organ-donation-information during the interaction.

Afifi et al.'s (2006) outcome expectancy variable can be compared to Greene's (2009) *assess receiver* component in which individuals assess a target's expected reaction to disclosure of information such as anticipated response (e.g., support) and anticipated outcome (e.g., relational consequences). Greene et al. (2009), for example, found that anticipated relational consequences positively predicted disclosure efficacy, while anticipated response support positively predicted anticipated relational consequences and likelihood of disclosure, but not disclosure efficacy directly. For health information, Greene et al. (2010) found that expectations of a supportive response to disclosure positively predicted consequences for the relationship but not disclosure efficacy directly. Similarly, the RRM (Afifi & Steuber, 2009) argues that individuals assess the risk of revealing a secret in terms of self protection, other protection, and relationship protection. Results of Afifi and Steuber's study demonstrated that the more individuals felt revealing a secret would be risky, the less willing they were to reveal it to a target person, and the less likely they were to actually reveal it.

*Summary.* The role of efficacy is a common feature in the TMIM, DD-MM, and RRM. Additionally, unlike theories such as CPM (Petronio, 2002), PI (e.g., Babrow, 2007), and UMT (e.g., Brashers, 2001) which provide frameworks for examining privacy and information management in various contexts, the TMIM, DD-MM, and RRM can be (and have been) tested. Such testing allows researchers to better understand the variables influencing people's decisions to seek and/or provide information. For example, while the TMIM identifies the factors predicting people's information seeking behaviors, the DD-MM and RRM argue that people assess certain factors as part of the decision-making process to disclose health information and reveal a secret, respectively.



Additionally, both the TMIM and the DD-MM address the notion of uncertainty in decision-making. In the TMIM, uncertainty discrepancy predicts the level of anxiety individuals have between their actual and desired level of uncertainty. Although uncertainty is at the foundation of the DD-MM, Greene (2009) does not make any predictions as to its role, except to say that individuals must manage uncertainty (about health information) through disclosure. Mishel's (1988) uncertainty in illness theory and revised uncertainty in illness theory (RUIT; Mishel, 1990) focus primarily on the sources and outcomes of uncertainty for people with acute and chronic health conditions. The last section will examine the theories.

### *Uncertainty in Illness Theory*

Uncertainty in illness theory (UIT, Mishel, 1988) was developed to address uncertainty during diagnostic, treatment, and recovery phases of life threatening illnesses. UIT proposes that uncertainty occurs in illness situations that are "ambiguous, complex, unpredictable, and when information is unavailable or inconsistent" and when individuals are unable to understand the meaning of illness-related events (Mishel & Clayton, 2003, p. 25). The reconceptualization of uncertainty in illness theory (RUIT; Mishel, 1990) extended Mishel's (1988) theory to accommodate the ongoing uncertainty experienced by people living with chronic illness, or illness with the possibility of recurrence, and where self-management is the primary goal (Mishel & Clayton, 2003). The expanded RUIT proposed a focus not on eliminating uncertainty, but rather gradually accepting uncertainty and incorporating it into one's life and one's life view (Mishel, 1999). This is similar to the notion of reappraisal of uncertainty (Brashers et al., 2004) or redefining decision-making situations (Brashers et al., 2000).

UIT is organized around three major themes: *antecedents of uncertainty*, *appraisals of uncertainty*, and *coping with uncertainty*. RUIT added the concepts of *self-organization* and *probabilistic thinking* (see also Babrow, 1992). The first major theme, *antecedents of uncertainty*, is divided into three categories. The first category, *stimuli frame*, consists of symptom pattern and event familiarity (Mishel, 1988). Symptom pattern relates to the symptoms of disease that the patient is experiencing (e.g., chest pain). Event familiarity, the degree to which a situation is habitual, repetitive, or contains recognizable cues, is fostered by time and experience in a particular health care environment (Mishel, 1981). A person with chronic heart disease, for example, may know the routines of his/her cardiologist's office. The second antecedent category, *structure providers* includes credible authority, social support, and education. Credible authority refers to the degree of trust and confidence a person has with health care providers (Mishel, 1988). Social support reflects the degree to which the person is able to share ideas and opinions with others who have experienced the disease. Level of education is the third factor included in the antecedent of structure providers, measured in school years attended. The final antecedent, *cognitive capacity*, is the information-processing ability of a person. For example, compromised cognitive capacity due to fever, infection, mind-altering medication, and disease progression can result in uncertainty (Mishel & Clayton, 2003).

*Appraisal of uncertainty* is the second UIT theme and involves placing a value on the uncertain event or situation. This is similar to Babrow's (1992, 1995, 2001, 2007) evaluative orientation in which individuals consider how positive, negative (or neutral), good or bad it would be to have a particular illness or condition. For example, uncertainty

may be exacerbated when patients with prostate cancer are asked to choose between two or more treatment options (Yu Ko & Degner, 2008). After uncertainty has been appraised, the third theme, *coping with uncertainty*, becomes salient. Without proper appraisal, however, coping cannot occur (Mishel, Padilla, Grant, & Sorenson, 1991).

The RUIT added two concepts to the original UIT. The first concept, *self-organization*, becomes evident when individuals are able to view uncertainty not as a negative response to illness but rather are able to achieve a new perspective in which uncertainty becomes a part of life. People's transition through uncertainty reveals themes such as "new ways of being in the world," "reevaluating what is worthwhile," "redefining what is normal," and "building new dreams" (Mishel & Clayton, 2003, pp. 38-39; see also Bailey & Stewart, 2001). Self-organization can be compared to PI theory's evaluative orientation in which, for example, a person feels fortunate that a heart condition was diagnosed early in the disease progression (i.e., before experiencing a heart attack). *Probabilistic thinking* is the second concept added to UIT which occurs when expectations of certainty and predictability are abandoned and "uncertainty is accepted as the natural rhythm of life" (Mishel & Clayton, 2003, p. 31). Mishel's (1990) notion of probabilistic thinking influenced Brashers' (2001, 2007) work on the communication processes in the management of illness-related uncertainty, and Babrow's (1992, 1995, 2001, 2007) notion of probabilistic orientation.

*Tests of the theory.* Research utilizing UIT (Mishel, 1988, 1990) has investigated how the antecedents of uncertainty such as structure providers, stimuli frame, and cognitive capacities influence people's appraisal of uncertainty in acute illnesses (e.g., Gil et al., 2004; Wallace, 2004; for reviews see Mast, 1995; Mishel, 1999; Mishel &

Clayton, 2003). There has been less focus on how people with chronic illnesses appraise uncertainty (e.g., danger or opportunity) and how those appraisals influence how individuals manage chronic uncertainty (e.g., Kang, 2005; see also Mishel & Clayton, 2003). However, some support for the notion of accepting uncertainty as part of life (i.e., opportunity) has been demonstrated in studies with diabetic patients (Nyhlén, 1990), chronically ill men (Charmaz, 1994), breast cancer survivors (Nelson, 1996), women recovering from heart disease (Fleury, Kimbrell, & Kruszewski, 1995), and spouses of heart transplant patients (Mishel & Murdaugh, 1987; see also Mishel, 1999; Mishel & Clayton, 2003) and thus, the studies are supportive of appraisals of uncertainty in other theories. For example, UMT (see Hogan & Brashers, 2009) argues that what people do when faced with uncertainty depends on the resources available and how they appraise what they are experiencing. In terms of PI theory, Babrow and Matthias (2009) argue that a less common realization about uncertainty is that people who are faced with sustained uncertainty, such as those with substantial chronic health problems (e.g., heart disease, diabetes, some forms of cancer), “come to see and accept uncertainty as a basic feature of existence” (see also Mishel, 1990).

More recently, researchers utilizing RUIT have focused on a broadly defined role for communication in the management of illness uncertainty for breast cancer survivors (e.g., Clayton, Dudley, & Musters, 2008; Clayton, Mishel, & Belyea, 2006). For example, Clayton et al. (2008) investigated how fatigue and communication are related to breast cancer survivor uncertainty and mood state, and survivor perception of patient-centered communication. Routine follow-up visits of women and their providers (e.g., physician, nurse practitioner) were audio-taped and coded for patient-centered

communication. Additionally, the women completed post visit self-report measures assessing fatigue, survivor uncertainty, mood state, survivor-provider communication, survivor perception of communication within the immediate visit, and provider uncertainty. A key finding relevant to the present study is that discussion about symptoms (i.e., “communication within immediate visit”) was most influential in predicting survivor mood state (e.g., anxiety, depression, fatigue) and survivor perception of communication (e.g., whether patients perceived that their concerns were addressed.). Clayton et al. opined that women may be motivated to discuss their concerns about persistent symptoms with providers as a way of seeking reassurance about the possibility of recurrence, thereby reducing their uncertainty about the future and breast cancer recurrence. Clayton et al. recognize, however, that preserving hope by avoiding discussions of symptoms and subsequent possible recurrence may reflect a more positive adaptation to illness (see Brashers et al., 2000).

Similarly, Clayton et al. (2006) examined the role of symptoms (from previous treatment), age, patient uncertainty, and communication with healthcare providers on the well-being of older breast cancer survivors. Results indicated that symptoms, age, and uncertainty had the strongest influence on well-being. Specifically, as breast cancer survivors’ age, they experience less bothersome symptoms, resulting in less uncertainty and improved well-being during survivorship. As uncertainty increased, however, women experienced a worsening mood state as well as increased thoughts about the possibility of a recurrence. One unexpected finding was a positive association between patient-provider communication and the number of troublesome thoughts of recurrence. Clayton et al. (2006) suggested that patients in the study may have been unable to control the flow of

information, possibly receiving more information about symptoms and implications than desired or expected. Uncertainty literature positing that more information does not necessarily reduce uncertainty (and may actually increase uncertainty) provides an explanation for the unexpected finding (e.g., Berger & Calabrese, 1975; Babrow, 1992, 1995, 2001, 2007; Brashers et al., 2000) and should be considered. In the present study, for example, could a spouse's asking questions *too* often about disease prognosis or symptoms increase uncertainty for his/her partner?

In light of the studies by Clayton and colleagues, it is important to note that a large body of research exists on communication in the medical encounter (e.g., physician-patient, nurse-patient) (see Street, 2003 for a review). Such research has highlighted the role of biomedical (focusing on the "disease") and biopsychosocial (focusing on the whole person) models in the physician-patient relationship (e.g., Bensing, 2000; Engel, 1977; Mishler, 1981). Other research has identified types of physician-patient relationships (Bertakis et al., 1998; Emmanuel & Emmanuel, 1992; Roter, 2000; Roter & McNellis, 2003), the functions of communication in the physician-patient relationship (see Ong, de Haes, Hoos, & Lammes, 1995 for a meta-analysis), and the structure of communication in the medical visit (e.g., Heritage & Robinson, 2006; Rimal, 2001; Robinson, 2003).

For Mishel (1999), uncertainty among chronically ill adults stems from numerous sources such as the nature of the illness, an unknown future, questioning one's identity, a lack of information or social support, conflicting diagnoses from healthcare providers, personality dispositions, and management of uncertainty. Missing from research utilizing UIT and RUIT, however, is a recognition that the numerous sources of illness uncertainty

entail not only *self*-focused concerns about one's illness, but *partner*-focused and *relationship*-focused concerns, as well (Brashers, 2001). That is, UIT and RUIT conceptualize illness uncertainty as uncertainty *about the illness* while focusing less on people's *experience* of illness uncertainty for themselves, their partner, and their relationship with their partner. Goldsmith (2009) argues that a better understanding and appreciation of how couples cope with serious illness requires consideration of how multiple sources of uncertainty are inter-related. The present study explores uncertainty about prognosis and symptoms and how they influence patterns of disclosures for people managing chronic heart-related conditions.

Additionally, although the work of Mishel and others has recently examined uncertainty management interventions (e.g., Gil et al., 2006; Mishel et al., 2005) and the role of communication in people's appraisals of illness uncertainty (e.g., Clayton et al., 2006; Mishel et al., 2006), the studies predominantly focus on patient-provider relationships in clinical settings (e.g., clinical nursing). Moreover, Mishel and Clayton (2003) posit that "since uncertainty is a clinical phenomenon, it is in the clinical setting where it should be addressed" (p. 43). People with chronic health conditions such as diabetes or heart disease, however, may spend more time managing their health conditions outside of, rather than *in* a clinical setting. The day-to-day experiences of living with a chronic disease (and chronic uncertainty) are likely different from managing illness uncertainties within a clinical setting, especially within a high stress physician visit. Further, no research utilizing UIT has examined the effects of illness uncertainty on people's communication with significant others (e.g., partner, children, siblings) about their health condition. Thus, continued research is necessary to better understand the

various sources of uncertainty that people with chronic health conditions experience, and how those sources influence their ongoing disclosures.

Another matter not addressed in UIT and RUIT is that different illnesses may have specific characteristics resulting in diverse forms of uncertainty (Brashers et al., 2003). Stigma and social isolation, for instance, are likely larger concerns for people living with HIV/AIDS than for people managing heart disease (cf. DD-MM's assessment of information stigma component). Brashers et al. suggested that subgroups in populations may experience illness uncertainty differently (e.g., HIV positive homosexuals versus injection drug users) (see also Smithson, 2008). In terms of heart disease, elderly people are likely to have different concerns than do younger people with a similar condition. Further, women and men may experience illness uncertainty differently. In a study of gender differences in perceptions of coping and social support among patients who experienced a cardiac event (e.g., heart attack), women tended to report that they had less social support up to one year after the event compared with men. Women received less information about the disease and rehabilitation and experienced lack of belief in their heart problems from caregivers such as spouses. Men, on the other hand, tended to report more support from their spouses than did women (Kristofferzon, Lofmark, & Carlsson, 2003). Thus, women and men potentially may experience and manage uncertainty differently.

*Summary.* Mishel's conceptualization of uncertainty as defined in UIT (1988) and RUIT (1990) influenced both PI theory (e.g., Babrow, 2007; Babrow & Matthias, 2009) and UMT (Brashers, 2001; Hogan & Brashers, 2009). Mishel and colleagues work has predominantly focused on the antecedents of people's uncertainty in clinical settings and



health outcomes of uncertainty. Except for two recent studies examining patient uncertainty and communication with a healthcare provider (e.g., Clayton et al., 2006; Mishel et al., 2006) no research has utilized UIT or RUIT to examine the role of illness uncertainty on people's ongoing disclosure to others (e.g., spouse/ partner) about a health condition.

### *Summary*

The theories just reviewed illustrate the numerous contexts in which uncertainty plays a salient role. For example, uncertainty allows people to explain and predict a new acquaintance's behavior (Berger & Calabrese, 1975), question where a relationship is going (Knobloch & Solomon, 1999, 2002), consider the chances of developing a chronic illness (Babrow, 1992, 1995, 2001, 2007), determine how a person copes with a chronic illness (Brashers, 2001, 2007), seek information (Afifi & Weiner, 2004), or view a particular health condition as an opportunity or a danger (Mishel, 1988, 1990).

Additionally, the review illuminated several dimensions of uncertainty (e.g., ontological, epistemological) and various sources of uncertainty (e.g., self, other, relationship, medical). Taken together, the theoretical approaches suggest that it is people's appraisal of uncertainty that predicts how they will manage uncertainty (e.g., reduce, increase, or maintain) in a particular context. Babrow and Mattias (2009) argue, however, that attempts to "manage" or "regulate" uncertainty imply that it is inherently an experience that can and should be controlled, and they invite scholars to "think with greater complexity, subtlety, and humanity about significant uncertainty and *the role of communication in these experiences*" (p. 24; italics added).

*Summary of Disclosure and Uncertainty*

The present study focuses on how uncertainty influences communicative behavior (e.g., depth, breadth, and frequency) in terms of sharing information with a partner about a chronic health condition. Similar to appraising uncertainty, individuals appraise or assess information (among other things) prior to disclosing (or not). Information may be appraised in terms of its nature (e.g., secret, private, stigmatizing), valence (e.g., positive, negative, neutral, certainty, uncertainty), risks and benefits, and reasons (e.g., catharsis, support). Additionally, individuals assess factors such as their relationship with a disclosure target and expectations of a target's response. Research to date, however, has not explored disclosures beyond initial revelation (e.g., "I have a heart blockage), nor the role of illness uncertainty in people's patterns of disclosure. The next chapter will explicate an uncertainty and disclosure model and advance hypotheses for testing predictions.

## CHAPTER 3

### Prognosis and Symptom Uncertainty and Disclosure Model

The present study draws from two theoretical areas, namely disclosure and uncertainty. Specifically, Greene's DD-MM (2009) (see Figure 1) focuses on health contexts and recognizes the role of uncertainty in the disclosure decision-making process and is utilized as a theoretical framework. Goals for the study are two-fold. The first goal is to contribute to our understanding of health disclosure decision-making by looking beyond initial disclosure and examining the depth, breadth, and frequency of disclosure to a partner regarding a chronic health condition. A second goal is to expand the DD-MM's underlying foundation of uncertainty in the health disclosure decision-making process. Toward this end, an *uncertainty and patterns of disclosure model* (see Figure 2) is hypothesized in which relational quality and perceived partner support are expected to account for associations between prognosis and symptom uncertainty (self-, partner-, and relationship-focused), communication efficacy to partner, and the depth, breadth, and frequency of disclosure about a chronic health condition. The following section will explicate the paths in the proposed *uncertainty model and patterns of disclosure* (see Figure 2).

#### *Assessing the Information*

The DD-MM posits that prior to disclosing health information people assess the information in terms of five areas (i.e., stigma, preparation, prognosis, symptoms, and relevance to others). The five components may be weighed in progression, simultaneously, or it may be that only one or two are relevant for a particular piece of information being shared (e.g., a diagnosis or results of a blood test) (Greene, 2009).

### *Prognosis and Symptom Uncertainty*

The present study explores the continuous nature of health disclosure decision-making under conditions of uncertainty about disease *prognosis* and *symptoms* related to a health condition. The two are likely interrelated (Greene, 2009). For example, people may experience uncertainty if new or different symptoms develop and attempt to determine whether the symptoms are signs of recurrence (e.g., cancer), exacerbation (e.g., multiple sclerosis), or another cardiac event (e.g., heart attack). Similarly, they may experience uncertainty about what the new symptoms mean for their disease prognosis. A person who has been able to avoid revealing a chronic illness to others may experience uncertainty about others noticing symptoms of the health condition (e.g., “Do I *look* like a heart patient?”). Another person diagnosed with primary lateral sclerosis (PLS) felt compelled to reveal the illness to others with whom she came in contact because some people attributed her slurred speech to being intoxicated. Thus, the process of disclosure may be forced on some people because of specific symptoms or declining health (see Greene, 2009).

Much prior research has investigated uncertainty surrounding an HIV/AIDS diagnosis. For example, the unpredictability of disease progression or prognosis (e.g., course) and ambiguous symptom patterns are two of the many sources of uncertainty for people living with the disease (Brashers et al., 2000, 2003). Further, Goldsmith (2009) found that patients diagnosed with heart disease and various forms of cancer experienced illness uncertainty regarding prognosis and symptoms, as well as uncertainty about how the illness influenced their relationship with their partner. As Mishel (1990) suggested,

people experiencing chronic illness must also manage chronic uncertainty (see also Brashers et al., 2000).

*The experience of uncertainty.* Uncertainty is a neutral, cognitive state that is not associated with emotions until it is evaluated; once evaluated, the experience of uncertainty may give rise to positive (e.g., hope) or negative (e.g., fear) emotions (Mishel & Clayton, 2003). Emotions are activated by neurochemical, neuromuscular, affective, and cognitive processes (Izard, 1991). People are most likely to experience emotion when their usual patterns of behavior are interrupted (Berscheid, 1983; Mandler, 1975). Gudykunst and Nishida (2001) argued that anxiety is the affective equivalent of uncertainty and stems from “feeling uneasy, tense, worried, or apprehensive about what might happen” (p. 59). People manage uncertainty and the emotions associated with it in various ways (e.g., Afifi & Weiner, 2004; Brashers, 2001). For example, a meta-analysis of gender differences in coping and social support following a myocardial infarction found that women (more than men) tended to minimize the impact of the disease, delayed seeking treatment, and did not want to bother others with their health problems (Kristofferzon et al., 2003). Thus, avoiding information is one of the many ways that people manage uncertainty surrounding a chronic health condition. Yet, people also seek information to reduce or increase their uncertainty (e.g., Afifi & Weiner, 2004; Brashers et al., 2000).

Although emotions (e.g., anxiety in response to uncertainty) have unique motivational and adaptive functions designed to energize and organize thoughts and actions, intense emotions may become disruptive and disorganizing (Izard, 1991). Gudykunst and Nishida (2001) found that uncertainty negatively predicted effectiveness

of communication in interactions between close friends. Further, the experience of uncertainty in relationships undermines people's confidence in their ability to communicate with a partner (Knobloch & Satterlee, 2009). Individuals experiencing uncertainty about their prognosis or symptoms may be less confident in their ability to talk about their health condition. Goldsmith (2009) argued that "illness uncertainty may prompt a desire to talk with one's partner, yet the changes they are experiencing may make partners unsure about how to communicate" (p. 217). Additionally, it is likely that uncertainties about prognosis and symptoms are not only *self*-focused (e.g., "I wonder if others notice symptoms of my health condition"), but could also be *partner*- focused (e.g., "My partner thinks my prognosis is good") and/or *relationship*-focused (e.g., "I don't know what our future will be like"). Based on this logic, and the DD-MM, it is expected that uncertainty about prognosis and symptoms will be negatively associated with individuals' perceptions of their ability to communicate to their partner about their health condition.

*H1a and H2a:* Prognosis and symptom uncertainty will negatively predict communication efficacy to partner.

The DD-MM argues that disclosure efficacy plays a significant role in the disclosure decision-making process such that assessment of information and assessment of a receiver predict disclosure efficacy and subsequent disclosure (or nondisclosure). It may be, however, that when people experience high uncertainty about their health condition the role of efficacy becomes less important. That is, individuals may devise a more efficient plan through which to accomplish their goal (Berger, 1997, 2008). A person who normally feels incapable of talking to a spouse about his/her health issues but

who faces impending heart surgery may uncharacteristically wish to talk about a range of topics (e.g., post-operative symptoms, side effects of new medications) and/or talk in-depth about specific health concerns such as long-term prognosis. Needing a partner's support during a stressful time may be more salient to an individual than his/her perceived ability to discuss sensitive life issues on a regular basis.

It is also possible that prognosis and symptom uncertainty positively *or* negatively directly predict breadth, depth, and/or frequency of disclosure about a health condition. As discussed previously, individuals seek information in initial interactions to reduce their uncertainty about another person (Berger & Calabrese, 1975) and maximize future outcomes (Sunnafrank, 1986, 1990). In more established relationships, the experience of relational uncertainty has been linked with avoiding discussion of sensitive subjects within cross-sex friendships (Afifi & Burgoon, 1998), dating relationships (Knobloch & Carpenter-Theune, 2004), and family relationships (Afifi & Schrodt, 2003). Yet, increased intimacy in relationships has also been linked with more direct communication about uncertainty-increasing events such as jealousy experiences (Theiss & Solomon, 2006a). In terms of health contexts, people experiencing illness uncertainty seek and avoid information in order to decrease, increase, or maintain their level of uncertainty (e.g., Afifi & Weiner, 2004; Babrow, 2001, 2007; Brashers, 2001, 2007; Goldsmith, 2009; Mishel, 1988, 1990). The DD-MM argues that people assess their ability to disclose prior to actual disclosure. Yet, there may be times when communication efficacy is not a factor in the disclosure process for people managing illness uncertainty. Further, it is not clear whether prognosis and symptom uncertainty will positively or negatively predict

people's patterns of communication (i.e., depth, breadth, and frequency of disclosure).

Thus, the following research questions are posited:

*RQ1 and RQ2:* Do prognosis and symptom uncertainty directly (positively or negatively) predict depth, breadth, and frequency of disclosure about one's health condition?

### *Prognosis and Symptom Uncertainty and Assessment of Receiver*

#### *Anticipated Support*

The present study focuses on how prognosis and symptom uncertainty surrounding a chronic health condition influence subsequent communication with a partner about the condition. Whereas the DD-MM is concerned with anticipated reaction such as anticipated support related to an *initial* health disclosure (e.g., "I had a heart attack" or "I have breast cancer"), the present study examines people's perceptions of a partner's continued support (e.g., emotional, instrumental) in the context of a chronic health condition. For example, a person who discloses that he feels "like a marked man" following a recent heart attack may be less likely to share feelings with his partner in the future if he perceives that her response dismisses or belittles him (e.g., "Oh, don't be silly. No one will even notice"). Prior research indicates that significant others influence how individuals appraise and manage illness-related uncertainty (Goldsmith, 2009; see also Brashers et al., 2004).

Although some literature has focused on how a lack of social support contributes to feelings of uncertainty for the chronically ill individual (e.g., Wineman, 1990; also see Mishel, 1999), there has been less focus on how uncertainty surrounding chronic health conditions influences perceptions of support from others, especially partners. The notion



of stigma, however, may provide a link between illness uncertainty and perceptions of a partner's support. Greene (2009) argues that "attribution for responsibility of a disease is a critical facet of both disclosure and response" (p. 233). Disclosure decisions are complex for stigmatized individuals (e.g., Garcia & Crocker, 2008; Greene et al., 2003; Slade, O'Neill, Simpson, & Lashen, 2007). For example, a study of pregnant women with multiple sclerosis (MS) found that they feared negative reactions from others and presented their pregnancy as an "accident" or agreed to a Caesarean delivery to avoid negative attributions from others (Smeltzer, 1994). Similarly, a person with chronic obstructive pulmonary disease (COPD) experiencing uncertainty about increased dyspnea (breathing difficulty) may believe that his/her partner will not provide support because despite the partner's repeated requests for him/her to quit smoking the person continues to smoke. On the other hand, a person experiencing uncertainty about a health condition may perceive that his/her partner will not provide support because the person may have his/her own illness-related concerns.

In addition, because uncertainty makes people more reactive to their circumstances (Solomon & Knobloch, 2004) a person may perceive a partner's behaviors as unsupportive and/or controlling. For example, Franks et al., (2004) examined supportive and controlling health-promoting exchanges of couples in which the husband was recently treated for heart disease. One finding suggested that perceptions of support are balanced by the recall of prior provision of aid to the partner or by the expectation of future provision of aid. The finding is consistent with prior research that providing support to one's partner is influenced by perceptions of receiving support from that partner (see Brown, Nesse, Vinokur, & Smith, 2003). Additionally, results of a study of

patients recovering from CABG surgery indicated that talking about lifestyle change communicated positive meanings such as support and caring, but also implied control, criticism, and a reminder of illness (Goldsmith, Bute, & Lindholm, 2007). Thus, it is expected that higher prognosis and symptom uncertainty will be negatively associated with perceptions of partner support (e.g., emotional, informational, instrumental).

*H1b and H2b:* Prognosis and symptom uncertainty will negatively predict perceived partner support.

#### *Relational Quality and Perceived Partner Support*

Greene (2009) argued that relational quality (e.g., closeness) and anticipated reactions (e.g., support and relational consequences) are likely positively correlated (see also Afifi & Olson, 2005; Afifi & Steuber, 2009). A recent study by Greene et al. (2009), however, found that relational quality positively predicted anticipated response (support) and indirectly predicted anticipated outcome (relational consequences). The present study focuses on people in established, longer-term relationships and their perceptions of disclosure to their partner about a health condition. Anticipated response in this study is conceptualized as an individual's perceptions of a partner's continued support (i.e., perceived partner support). Research suggests that individuals disclose to people with whom they are close, they can trust, and who will support them (Petronio, 2002; Vangelisti et al., 2001). Thus, it is expected that people who report higher relational quality with their partner will also perceive that their partner provides them with needed support (e.g., instrumental, emotional).

*H3:* Relational quality will positively predict perceived partner support.

*Perceived Partner Support and Communication Efficacy to Partner*

Considerable social support literature suggests that people's perceptions of partner support are a salient component in the management of acute and chronic health conditions (for reviews see Albrecht & Goldsmith, 2003; Goldsmith, 2004). For women with breast cancer, support from a spouse was associated with positive mood indirectly through positively-focused coping (Manne, Pape, Taylor, & Dougherty, 1999). Breast cancer patients who confide fears and concerns to supportive others, such as spouses or close friends, tend to fare better emotionally (see Albrecht & Goldsmith, 2003). Additionally, studies of women with rheumatoid arthritis (Manne & Zautra, 1989) and people with various types of cancer (Manne, Taylor, Dougherty, & Kemeny, 1997) indicated that perceptions of partner support played a role in patients' psychological distress and well-being.

For people diagnosed with coronary artery disease (CAD), the beneficial effects of social support on patient prognosis and on the risk of recurrent CAD events have been demonstrated for both men and women (Wang et al., 2005; see also Orth-Gomer, Rosengren, Wilhelmsen, 1993; Ruberman, Weinblatt, & Goldberg, 1984). For example, during a 3-year follow up period for women with CAD, Wang et al. (2005) found that there was greater coronary artery luminal narrowing (more advanced atherosclerosis) in women with low levels of social support than among women with high levels of support. The researchers concluded that a lack of emotional support, social isolation, and lack of interpersonal social relations may be important risk factors for accelerated progression of coronary heart disease among middle-aged women. Other studies have linked a lack of social support for people with CAD to depressive symptoms (Bosworth et al., 2000;

Shen, McCreary, & Myers, 2004), coping (Shen et al., 2004), and compliance with treatment (Sayers, Riegel, Pawlowski, Coyne, & Samaha, 2008).

The DD-MM proposes that individuals assess a potential target in terms of relational quality (discussed previously) and the target's likely reactions. Anticipated reactions may be positive (e.g., the person provides support), negative (e.g., anger, relational consequences), or neutral. In general, people must perceive a positive response in order to reveal information (Greene, 2009; see also Altman & Taylor, 1973; Greene & Serovich, 1996). Additionally, people evaluate anticipated reactions based on a target's prior responses to disclosed information. Because the current study explores disclosures of health information beyond initial disclosure, perceiving that a partner is supportive is particularly salient for predicting the ability to habitually share information with a partner (e.g., blood pressure readings, cholesterol levels). That is, if a partner provides emotional support (e.g., listens empathically when patient talks about frustrations of limited mobility), instrumental support (e.g., accompanies patient to physician appointments), or informational support (e.g., discusses medication side effects) then people are likely to perceive that they have the ability to communicate to the partner about a heart-related condition.

The DD-MM conceptualizes disclosure efficacy as a person's perceptions of his/her ability to send a specific message to a specific person, a narrower conceptualization of efficacy (Bandura, 1977; Makoul & Roloff, 1998) and communication efficacy (Afifi & Steuber, 2009; Afifi & Weiner, 2004). The current study conceptualizes *communication efficacy to partner* as people's perceived ability to communicate information about their health condition to their partner, and is

conceptualized as broader than disclosure efficacy (Greene, 2009) and a target-specific form of communication efficacy (see Afifi et al., 2005; Afifi & Steuber, 2009; Afifi & Weiner, 2004;). Thus, it is posited that:

*H4: Perceived partner support will positively predict communication efficacy to partner.*

*Communication Efficacy and Depth, Breadth, and Frequency of Disclosure*

The current study has focused on efficacy in terms of perceived ability to disclose (Greene, 2009) and communicate (Afifi & Steuber, 2009; Afifi & Weiner, 2004). Yet, expectations or beliefs about one's ability to perform actions necessary to produce particular effects have also been shown to predict a variety of health-related outcomes (Bandura, 1997; Holden, 1991; O'Leary, 1985; Strecher, Devillis, Becker, & Rosenstock, 1986). For example, ratings of patient efficacy to manage illness made by 191 congestive heart failure patients and their spouses were examined as predictors of patients' survival over the next 4 years. When considered alone, both the patient's self-efficacy and the spouse's confidence ratings predicted survival. It is logical to assume that perceived ability to talk to a partner about a chronic health condition is a likely predictor of the intimacy of talk, the range of topics discussed, and how often individuals talk about a health condition. In recent studies, communication efficacy predicted secret revelation (Afifi & Steuber, 2009) and disclosure efficacy predicted likelihood of sharing personal information (Greene et al., 2009). That is, when people perceive that they have the ability to share a piece of information or reveal a secret to a particular person, they are likely to do so.<sup>7</sup>

It has been demonstrated thus far that numerous factors influence the disclosure decision-making process. For example, people are more likely to disclose personal,

private, and secret information to those they trust and with whom they have close relationships (e.g., Greene et al., 2003; Petronio, 2002; Vangelisti et al., 2001). Yet, people may perceive that they have communication efficacy and still choose not to share certain topics with a partner. A husband may choose not tell his wife about an unusual symptom he is experiencing because his wife has her own health issues and he wants to avoid causing her more worry. The notion of topic avoidance suggests that individuals steer clear of certain topics in conversations with their relational partners and that this avoidance plays a role in their relationships (see Dailey & Palomares, 2004). Dialectical theory (Baxter, 1988; Baxter & Montgomery, 1996) argues that relational partners have simultaneous concerns of openness and closedness. People desire intimacy and closeness, yet they also desire autonomy and protection. Communication privacy management (Petronio, 1991, 2000, 2002) similarly argues that relational partners continuously balance privacy and disclosure concerns. In terms of sharing information about a health condition, even couples in otherwise satisfactory relationships report difficulty in talking to a partner about cancer-related or heart related issues (see Goldsmith et al., 2007; Goldsmith, 2009). As Greene (2009) noted, both confidence and skills are needed when sharing difficult information, and “at times people do share with trepidation, apprehension, and considerable uncertainty” (p. 242). The present study measures people’s patterns of disclosure to their partner about a health condition in terms of disclosure depth, breadth, and frequency. Further, it is hypothesized that communication efficacy predicts depth, breadth, and frequency of disclosure about a health condition. Reviewed next is research supporting predictions for each of the three disclosure constructs.

### *Depth of Disclosure*

According to social penetration theory (Altman & Taylor, 1973) the final stage of relationship development, stable exchange, is reserved for the most intimate relationships in which individuals continue to share information of intermediate depth and may share information that is at central core, including innermost fears, needs, values, and self-concepts. Similarly, Knapp, Ellis, and Williams (1980) found that *personalized* (e.g., breadth and depth) communicative behaviors increased as relationships became more intimate. In a study of dating couples, length of romantic interest was positively associated with the depth of relationship talk (Knobloch, Solomon, & Theiss, 2006). In established relationships people disclose not only how they feel, but how they feel about their partner and the relationship (Fitzpatrick, 1987). Married couples expressed intimacy by sharing thoughts, feelings, attitudes, and dreams (Derlega et al., 1993; see also Waring, Tillmann, Frelick, Russell, & Weisz, 1980). Further, for women with breast cancer, *partner* disclosures predicted feelings of intimacy because that type of disclosure was associated with feelings of acceptance, understanding, and caring (Manne et al., 2004; see also Lippert & Prager, 2001). Thus, if established relationships are characterized by intimate interactions (see Altman & Taylor, 1973; Prager, 1995; Reis & Shaver, 1988), then individuals who are faced with a chronic health condition and who perceive that they have the ability to talk to a partner, are likely to disclose in-depth about their health condition. Thus, it is posited that:

*H5: Communication efficacy to partner will positively predict depth of disclosure about a health condition.*

### *Breadth of Disclosure*

In early stages of relationship development, individuals are more guarded with their disclosure, sharing a limited breadth (and depth) of information (Altman & Taylor, 1973). In this stage, known as *orientation*, individuals typically share peripheral information such as occupation, age, and background. During the second phase, *exploratory affective exchange*, information shared tends to be peripheral in depth but with greater breadth. In the third phase, *affective exchange*, individuals can express messages in a variety of ways and are more open and flexible with topics of discussion. As discussed in the previous section, the final stage of relationship development, *stable exchange*, is characterized by the greatest degree of openness, ease of communication, and flexibility in messages. Thus, people in established and/or long-term relationships may communicate about a range of topics (e.g., jobs, families, health, the future, their relationship), while at the same time may avoid communicating about certain topics (e.g., Dailey & Palomares, 2004; Goldsmith et al., 2006b). However, if people perceive that they have the ability to communicate with their partner about their health condition, then they are likely to report that they disclose about a range of topics related to the condition. Thus, it is posited that:

*H6: Communication efficacy to partner will positively predict breadth of disclosure about a health condition.*

### *Frequency of Disclosure*

For some cancer patients, frequency of interaction with significant others allowed them to talk about their illness (Wortman & Dunkel-Schetter, 1979). Other cancer patients reported little or no communication about their disease (e.g., Krant & Johnston,



1978). Compared to maladjusted cancer patients, however, well-adjusted cancer patients reported talking more frequently about their illness and its consequences (Gotcher, 1995). For patients recovering from coronary artery bypass graft (CABG) surgery, Goldsmith et al. (2006) suggested that couple's communication about lifestyle changes is a potent reminder that life has changed, and the patient's identity and illness trajectory are implicated in the frequency and content of that talk. For example, some patients discussed their desire to view their heart disease as "fixed" by their recent CABG surgery (as well as medication, diet etc.) and wished to return to "normal activities" (p. 2085). Although some patients perceive their partners as being overprotective if they ask too often how the patient is feeling, others attributed a partner's unwillingness to talk as denying that the patient has heart disease (Goldsmith et al., 2006).

A growing body of research highlights the key role of close relationships in successful coping with heart disease and other forms of chronic illness. For example, Coyne, Rohrbaugh, Shoham, Cranford, & Nicklas (2001) examined the prognostic importance of marital quality for survival of congestive heart failure in their study of 189 patients and their spouses. One of the two marital quality components predicting best in the study was the reported frequency of their "useful discussions" about the patient's illness (i.e., how often the couple talks about various aspects of coping with heart disease). Findings indicated that the composite measure of marital quality predicted the patient's survival over the next 8 years independent of baseline illness severity (Rohrbaugh, Shoham, & Coyne, 2006). In sum, frequency of talk about a chronic illness may be a strong predictor of better health outcomes; however, a person must perceive the ability to talk to a partner about his/her health condition before doing so. Thus, it is

expected that a person who perceives the ability to talk about his/her health condition with a partner is likely to report frequent disclosures to a partner about the condition.

Thus, the following hypothesis is posited:

*H7: Communication efficacy to a partner will positively predict frequency of disclosure about one's health condition.*

### *Summary*

To summarize, prognosis and symptom uncertainty will negatively predict communication efficacy to partner (H1a, H2a). Prognosis and symptom uncertainty will negatively predict perceived partner support (H1b, H2b). Next, relational quality will positively predict perceived partner support (H3), and perceived partner support will positively predict communication efficacy to partner (H4). Communication efficacy will positively predict depth, breadth, and frequency of disclosure about a chronic health condition (H5-7). Finally, two research questions are proposed. Are prognosis (RQ1) and symptom (RQ2) uncertainty directly related to breadth, depth, and/or frequency of disclosure?

## CHAPTER 4

### Methods

Hypotheses and research questions were tested by conducting a cross-sectional study in which participants provided self-report data about sharing information about a heart-related condition with another person. Based on the patients, four conditions were created. Survey conditions for *patients* included either sharing information with a spouse/partner or sharing information with another person (e.g., son, daughter, or friend). Survey conditions for *others* accompanying the patient included either a spouse's perceptions of the patient sharing information with him/her or another person's (e.g., son, daughter, or friend) perceptions of the patient sharing information with him/her. All procedures were reviewed and approved by Rutgers University's Institutional Review Board (IRB).

### *Participants*

Participants were recruited from a private medical office in a suburban area of the northeastern United States. Specifically, the 20 physician practice specializes in cardiovascular diseases, and the physicians are board certified in internal medicine and cardiology (as well as additional subspecialty board certifications such as critical care and/or nuclear medicine). Patients typically visit the cardiologists' office for check-ups post angioplasty or coronary artery bypass graft (CABG) surgery, for semi-annual, annual (or more frequent) check-ups, for blood tests (e.g., prothrombin time or PT), diagnostic tests (e.g., stress test, echocardiogram, Holter monitor), pacemaker checks, and for pre-operative cardiac clearance related to impending surgery. Criteria for study participation included being age 18 or older and having a previously diagnosed heart-related condition.

The overall sample included 366 individuals who completed questionnaires. Of these participants, 186 (51%) were male and 176 (48%) were female (four people did not report gender). Individuals ranged from 36 to 97 years of age ( $M = 69.76$ ,  $SD = 11.57$ ) [five people did not report age]. Participants were predominantly Caucasian ( $n = 325$ ; 89%) with lower representation of African-Americans ( $n = 18$ ; 5%), and other ( $n = 7$ ; < 2%) [sixteen people (4%) did not report race/ethnicity]. Participants reported relationship length in years for spouse/partner ( $M = 39$ ,  $SD = 16$ ; range 2 to 70 years) and others such as sons, daughters, and friends ( $M = 44$ ,  $SD = 16$ ; range 2 to 85 years). Patients reported predominantly heart-related reasons for their office visit. Eleven patients did not report a diagnosis or reason for their appointment.

### *Procedure*

Two business days prior to their scheduled appointment, patients were notified via automated telephone system about an opportunity to participate in an anonymous survey on the day of their office visit. Upon arrival in the waiting room, a trained researcher approached the patient and asked if s/he would agree to participate in a study about sharing information about a heart-related condition with a spouse/partner or another person. If they agreed, patients were asked to read and sign a consent form (see Appendix C). After signing a consent form, patients were asked to complete a questionnaire in relation to their spouse/partner ( $n = 253$ ). If patients reported that they did not have a spouse/partner, they were asked to complete the questionnaire in relation to another person ( $n = 92$ ) such as a daughter or son with whom they share information about their health condition. Patients individually completed questionnaires related to that specific person.

If another person accompanied the patient, s/he was also asked to participate. If the person agreed, s/he was asked to read and sign a consent form. After signing the consent form, the participant ( $n = 18$ ) individually completed self-report measures about the way the patient shares information about a heart-related health condition with him/her. The patient and person accompanying the patient completed the questionnaires separately. Additionally, participants were asked to not discuss the questionnaire with others until they had returned them to the researchers. The questionnaires took approximately 15 minutes to complete.

Upon completion of the survey, participants had the opportunity to enter their name in a drawing for one of three \$50 Gift Cards. If interested, participants filled out the last page of the survey and were instructed to detach the page prior to returning the survey to the researchers. Completed surveys and drawing entries were kept in separate boxes. After returning the surveys, participants were provided with a debriefing form (see Appendix E) explaining the research study. Participants were invited to provide their name and address if they wished to receive preliminary results of the study in a few months' time and this was taken care of nine months later with letters to 15 patients.

Data collection took place during office hours over a two-week period. During the two-week period, approximately 937 patients came through the office (according to the office staff and sign-in sheets). Of those patients, researchers approached approximately 591 people (63%) to participate in the research study, and 397 people (67%) agreed to participate. Researchers were not able to approach approximately one-third of the patients who visited the office because some patients were immediately seen by their physician (without wait time), while others visited the office only to have a blood test and were

taken into the lab upon arrival. Although 397 participants agreed to participate and began filling out the questionnaire, 32 questionnaires were discarded for incomplete responses.

*Final sample.* Because the focus of this study is on patients sharing information about a heart-related condition with a partner, a subsample is reported here which included 253 patients who completed questionnaires in relation to their partner. Of these participants, 159 (63%) were male and 92 (36%) were female (two people did not report gender). Individuals ranged in age from 36 to 97 years ( $M = 68.45$  years,  $SD = 11.70$  years) (three people did not report age). Participants were predominantly Caucasian (91%); followed by African-American (4%), and other ( $< 2\%$ ) [nine people (4%) did not report race/ethnicity]. Participants reported being in relationships with their partners from 2 to 70 years ( $M = 38.75$ ,  $SD = 15.62$ ).

### *Measures*

Variables measured included prognosis uncertainty (self-, partner-, and relationship-focused), symptom uncertainty (self-, partner-, and relationship-focused), relational quality, perceived partner support, communication efficacy to partner, and depth, breadth, and frequency of disclosure about a health condition. Confirmatory factor analysis (CFA) was used to evaluate the dimensionality of the measures. CFA requires items within factors to meet the criteria of face validity, internal consistency, and external consistency before being formed into factors (Hunter & Gerbing, 1982). Face validity is demonstrated when items have a precise and shared meaning. Internal consistency is demonstrated when items share strong positive correlations. External consistency is demonstrated when items are correlated similarly with an external factor. External

consistency was evaluated by including a five-item measure of relational quality in the CFA models.

Three goodness-of-fit indices were used to evaluate the CFA models. The  $\chi^2/df$  adjusts the  $\chi^2$  statistic for sample size (Kline, 1998). The *CFI* calculates the ratio of the noncentrality parameter estimate of the hypothesized model to the noncentrality parameter estimate of a baseline model (Bentler, 1990). The *RMSEA* accounts for errors of approximation in the population (Browne & Cudeck, 1993). It was determined that the model fit the data if  $\chi^2/df$  was less than 3, *CFI* was .90 or greater, and *RMSEA* was less than .10 (Browne & Cudeck, 1993; Kline, 1998). After confirming the dimensionality of the factors, composite scores were created by summing and averaging responses to the individual items. Reliability was estimated by Cronbach's alphas. The specific measures will be described next.

#### *Prognosis and Symptom Uncertainty*

Uncertainties about a chronic health condition focused on two of the DD-MM's (Greene, 2009) assess *information* components most relevant to heart-related conditions. That is, uncertainty about one's health condition *prognosis* and uncertainty regarding *symptoms* of a health condition. Sources of uncertainty about a chronic health condition reflect a self-, other-, and relationship-focus (e.g., Brashers, 2001). Similarly, reasons for disclosure reflect a self-focus, other-focus, and an interpersonal-focus (i.e., relationship) (Derlega & Winstead, 2001; Derlega et al., 2000). Relational uncertainty is comprised of three interrelated sources of ambiguity: self uncertainty, partner uncertainty, and relationship uncertainty (e.g., Berger & Bradac, 1982; Knobloch & Solomon, 1999, 2002). Additionally, people's assessments of the risks in revealing a secret include self protection,

other protection, and relationship protection (Afifi & Steuber, 2009). Thus, based on prior literature and because the study focuses on how illness uncertainty for people in a relationship influences disclosure about their health condition, uncertainty was conceptualized as *self-focused*, *partner-focused*, and *relationship-focused uncertainty* regarding prognosis and symptoms of a chronic health condition. The measures employed 5-point Likert scales with responses ranging from 1 (*very uncertain*) to 5 (*very certain*).

*Self-focused prognosis uncertainty.* The following four items formed a unidimensional measure of *self-focused prognosis uncertainty* (see Appendix F): “My health will deteriorate” (reverse scored), “I am concerned about my future with this health condition” (reverse scored), “My health condition is chronic” (reverse scored), and “The prognosis for my health condition is good.” CFA results revealed that the items loaded onto the latent construct,  $\chi^2(26) = 39.46, p = .04, CFI = .97, RMSEA = .05$ . Scores were summed and averaged to form a composite variable with higher scores indicating greater uncertainty about the effect of the health condition on the person’s life ( $M = 2.98, SD = .71$ , range 1.25 to 5.00;  $\alpha = .50$ ) (see Table 2.1).

*Partner-focused prognosis uncertainty.* The following four items formed a unidimensional measure of *partner-focused prognosis uncertainty* (see Appendix G): “My spouse thinks that my health will deteriorate” (reverse scored), “My spouse is concerned about my future with this health condition” (reverse scored), “My spouse thinks that my health condition is chronic” (reverse scored), and “My spouse thinks that the prognosis for my health condition is good.” CFA results revealed that the items loaded onto the latent construct,  $\chi^2(26) = 45.50, p = .01; \chi^2(df) = 1.75, CFI = .96, RMSEA = .06$ . Scores were summed and averaged to form a composite variable with higher scores



indicating greater uncertainty about whether a partner thinks the health condition affects the person's life ( $M = 2.93$ ,  $SD = .74$ , range 1.25 to 5.00;  $\alpha = .63$ ) (see Table 2.2).

*Relationship-focused prognosis uncertainty.* The following four items formed a unidimensional measure of *relationship-focused prognosis uncertainty* (see Appendix H): “My deteriorating health will affect our relationship” (reverse scored), “My health condition is a concern for the future of our relationship” (reverse scored), “The chronic nature of my health condition has affected our relationship” (reverse scored), and “The prognosis of my health condition has not affected our relationship.” CFA results revealed that the items loaded onto the latent construct,  $\chi^2(26) = 35.49$ ,  $p = .10$ ,  $CFI = .98$ ,  $RMSEA = .04$ . Scores were summed and averaged to form a composite variable with higher scores indicating greater uncertainty about whether the health condition affects the partners' relationship ( $M = 3.76$ ,  $SD = .89$ , range 1.00 to 5.00;  $\alpha = .79$ ) (see Table 2.3).

*Evaluating the second-order factor structure.* Bivariate correlations revealed that the three scales were positively correlated at the zero-order level (see Table 1). These correlations ranged from .27 to .68, all  $p < .001$ . Accordingly, a next step was examining the factor structure of the scales at the second-order level. A second-order CFA was constructed by assigning the 12 items to their scales, and in turn, assigning the three scales to a single second-order factor. Findings indicated that the scales were unidimensional at the second-order level,  $\chi^2(49) = 108.69$ ,  $p < .01$ ;  $\chi^2(df) = 2.22$ ,  $CFI = .90$ ,  $RMSEA = .08$  (see Figure 3 ). The reliability of a composite index was satisfactory ( $M = 3.23$ ,  $SD = .63$ ,  $\alpha = .78$ ).

*Self-focused symptom uncertainty.* The following four items were used to measure *self-focused symptom uncertainty* (see Appendix I): “Symptoms of my health condition

are easy to spot” (reverse scored), “If I do not tell, no one notices my health condition,” “I do not pay attention to symptoms of my health condition” (reverse scored), and “I understand what symptoms of my health condition mean.” CFA results revealed a good model fit,  $\chi^2(16) = 12.30, p < .01, CFI = .99, RMSEA < .01$ ; however, reliability was poor ( $M = 2.28, SD = .62$ ). A decision was made to retain two items with the highest loadings. Scores were summed and averaged to form a composite variable with higher scores indicating greater uncertainty about whether others notice symptoms of the person’s health condition ( $M = 3.53, SD = .98$ , range 1.00 to 5.00;  $r = .25, p < .001$ ) (see Table 3.1).

*Partner-focused symptom uncertainty.* The following items were used to measure *partner-focused symptom uncertainty* (see Appendix J): “My spouse thinks that symptoms of my health condition are easy to spot” (reverse scored), “If I do not tell, my spouse thinks that no one notices my health condition,” “My spouse thinks that I do not pay attention to symptoms of my health condition” (reverse scored), and “My spouse thinks that I understand what symptoms of my health condition mean.” CFA results revealed a good model fit,  $\chi^2(17) = 21.19, p = .22, CFI = .99, RMSEA = .04$ ; however, reliability was poor ( $M = 2.44, SD = .58$ ). A decision was made to retain two items consistent with self-focused symptom uncertainty. Scores were summed and averaged to form a composite variable with higher scores indicating greater uncertainty about whether a partner thinks that others notice symptoms of the person’s health condition ( $M = 3.20, SD = .90$ , range 1.00 to 5.00;  $r = .26, p < .001$ ) (see Table 3.2).

*Relationship-focused symptom uncertainty.* The following items were used to measure *relationship-focused symptom uncertainty* (see Appendix K): “Easy to spot

symptoms of my health condition create challenges for our relationship”(reverse scored), “Others noticing the symptoms of my health condition have not affected our relationship,” “Not noticing the symptoms of my health condition affects our relationship”(reverse scored), and “Understanding what symptoms of my health condition mean has been good for our relationship.” CFA results revealed that the model fit the data,  $\chi^2(17) = 21.19, p = .22, CFI = .99, RMSEA = .04$ ; however, reliability was poor ( $M = 2.40, SD = .92$ ). A decision was made to retain two items consistent with self- and partner-focused symptom uncertainty. Scores were summed and averaged to form a composite variable with higher scores indicating greater uncertainty about whether others noticing symptoms of the person’s health condition affects the partners’ relationship ( $M = 3.64, SD = .92$ , range 1.00 to 4.50;  $r = .12ns$ ) (see Table 3.3).

*Evaluating the second-order factor structure.* Bivariate correlations revealed that the three scales were positively correlated at the zero-order level (see Table 1). These correlations ranged from .31 to .58, all  $p < .01$ . Accordingly, a next step was examining the factor structure of the scales at the second-order level. A second-order CFA was constructed by assigning the six items to their scales, and in turn, assigning the three scales to a single second-order factor. Findings indicated that the scales were unidimensional at the second-order level,  $\chi^2(4) = 10.65, p = .03; \chi^2(df) = 2.66, CFI = .96, RMSEA = .09$  (see Figure 4). The reliability of a composite index was satisfactory ( $M = 3.46, SD = .72, \alpha = .64$ ).

### *Relational Quality*

The quality of individuals’ relationships with their spouses was operationalized through a measure incorporating indicators of psychological closeness adapted from

Vangelisti and Caughlin's (1997) relational closeness scale (also see Greene et al., 2009; Vangelisti et al., 2001). Vangelisti and Caughlin's (1997) psychological closeness subscale consisted of seven items with factor loadings above .76 ( $\alpha = .93$ ). A recent study by Greene et al. (2009) reported *psychological closeness* containing seven items with factor loadings above .49 ( $\alpha = .85$ ). For this study, five of the seven items from Greene et al. (2009) with the highest factor loadings were retained and adapted to reflect perceptions of people's relationship with their spouse. In addition, three additional items were developed based on prior measures of marital quality (e.g., Norton, 1983; Spanier, 1976). The measure employed a 5-point Likert scale with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

The following five items formed a unidimensional measure of relational quality (see Appendix L): "I enjoy spending time with my spouse," "I am not close to my spouse" (reverse scored), "My spouse's opinion is important to me," "This relationship is satisfying," and "I couldn't ask for more from my spouse." CFA results revealed that the items loaded onto the latent construct,  $\chi^2(26) = 46.48, p = .01; \chi^2/df = 1.78, CFI = .97, RMSEA = .07$ . The items were summed and averaged to form a composite measure with higher scores indicating greater relational quality ( $M = 4.35, SD = .60$ , range 1.40 to 5.00;  $\alpha = .82$ ) (see Table 4).

#### *Perceived Partner Support*

The extent to which participants perceive that their spouse provides support was operationalized with items adapted from Greene et al. (2009; see also Greene & Faulkner, 2002). Greene et al. (2009) measured anticipated response *support* with six Likert-type items adapted from Greene and Faulkner (2002) and Kelly and McKillop (1996). All

items loaded above .70 ( $\alpha = .85$ ). For the present study, the author adapted three of the items to focus on support from spouses and created one additional item. The measure employed a 5-point Likert scale with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) (see Appendix M). The following four items formed a unidimensional measure of perceived partner support: “My spouse supports me emotionally,” “My spouse is not the one I go to for support” (reverse scored), “My spouse helps me find information,” and “I do not get much support from my spouse” (reverse scored). CFA results revealed that the items loaded onto the latent construct,  $\chi^2(26) = 51.55, p < .01$ ;  $\chi^2/df = 1.98, CFI = .97, RMSEA = .07$ . The items were averaged to form a composite measure with higher scores indicating greater perceived partner support ( $M = 4.25, SD = .73$ , range 1.0 to 5.0;  $\alpha = .80$ ) (see Table 5).

#### *Communication Efficacy to Partner*

Measures of participants’ perceptions of their ability to share information about their health condition with their spouse were adapted from literature on revealing secrets (e.g., Afifi & Steuber, 2009; Caughlin et al., 2005) and disclosing a health condition (e.g., Greene, 2009; see Appendix N). The measure employed a 5-point Likert scale with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The following four items formed a unidimensional measure of communication efficacy to partner: “I am confident that I can share information about my health condition with my spouse when I want to,” “I have difficulty sharing information about my health condition with my spouse” (reverse scored), “If I want to I can talk to my spouse about my health condition,” and “I do not know what to say when I try to share information with my spouse about my health condition.” CFA results revealed that the items loaded onto the latent construct,  $\chi^2(26) =$

44.54,  $p = .01$ ;  $\chi^2/df = 1.71$ ,  $CFI = .98$ ,  $RMSEA = .06$ . The items were averaged to form a composite measure with higher scores indicating greater communication efficacy to partner ( $M = 4.47$ ,  $SD = .61$ , range 2.00 to 5.00;  $\alpha = .84$ ) (see Table 6).

#### *Patterns of Disclosure about a Health Condition*

Social penetration theory (SPT; Berger & Calabrese, 1973) has typically been investigated in terms of self disclosure in relationship development, the common indicators of which are the depth and breadth of information exchange. This study investigates the extent (*depth*) to which individuals share intimate information about their health condition, the range of topics (*breadth*) that individuals share with their partners about their health condition, and how often individuals share information with their partners about their health condition (*frequency*).

*Depth.* Perceptions of the *depth* or intimacy of disclosure to spouses about a health condition were measured by four 5-point Likert items with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) (see Appendix O). Items were developed for this study based on prior research on the role of self-disclosure in definitions of intimacy (e.g., Lippert & Prager, 2001; Reis & Shaver, 1988). Closer, more satisfying relationships, for example, are nurtured by disclosing thoughts, feelings, and positive or negative emotions (e.g., Laurenceau, Feldman Barrett, & Rovine, 2005; Lippert & Prager, 2001; Manne et al., 2004; Reis & Shaver, 1988). Yet, research indicates that individuals in satisfactory relationships also avoid talk about certain health-related topics such as cancer (e.g., Goldsmith et al., 2006) and heart disease (e.g., Coyne & Smith, 1991; Goldsmith, 2009). The following four items formed a unidimensional measure of the depth of health condition communication with a spouse: “I have heart-to-heart talks with my spouse about my health

condition,” “My spouse and I only talk about superficial issues related to my health condition” (reverse scored), “I hold back from sharing intimate issues about my health condition with my spouse” (reverse scored), and “I share my innermost fears about my health condition with my spouse.” CFA results revealed that all of the items loaded onto the latent construct,  $\chi^2(26) = 48.43$ ,  $p < .01$ ,  $CFI = .97$ ,  $RMSEA = .07$ . The items were summed and averaged to form a composite measure of depth of disclosure about a health condition with a spouse, with higher scores indicating greater depth ( $M = 3.81$ ,  $SD = .83$ , range 1.75 to 5.00;  $\alpha = .75$ ) (see Table 7).

*Breadth.* Perceptions of the *breadth* or range of topics that individuals share with their spouses about their health condition were measured by four 5-point Likert items with responses ranging from a 1 (*strongly disagree*) to 5 (*strongly agree*) (see Appendix P). Items were developed for this study based on prior research on the role of self-disclosure in relationship development and maintenance (e.g., Altman & Taylor, 1973; Petronio, 2002) and topic avoidance in marital relationships (e.g., Finkenauer & Hazam, 2000). The following four items formed a unidimensional measure of breadth of disclosure with a spouse: “I discuss a wide variety of issues related to my health condition,” “There are some issues about my health condition that I do not talk about” (reverse scored); “There are some areas related to my health condition that I avoid discussing” (reverse scored), and “I am hesitant to share small health concerns” (reverse scored). CFA results revealed that the items loaded highly onto the latent construct,  $\chi^2(26) = 46.48$ ,  $p < .01$ ,  $CFI = .97$ ,  $RMSEA = .07$ . The items were summed and averaged to form a composite measure of breadth of disclosure about a health condition with a spouse, with higher scores indicating greater breadth ( $M = 3.68$ ,  $SD = .93$ , range 1.00 to 5.00;  $\alpha = .82$ ) (see Table 8).

*Frequency.* Perceptions of the *frequency* with which individuals disclose to a spouse about their health condition were measured by three 5-point Likert items with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), and one item with responses ranging from 1 (*never*) to 5 (*multiple times a day*) (see Appendix Q). Items were developed for this study based on prior research investigating spouses' frequency of useful discussions (Coyne & Smith, 1991) and talk about lifestyle changes (Goldsmith et al, 2006a) following a cardiac event. The following four items formed a unidimensional measure of frequency of disclosure about one's health condition: "We often talk about my health condition," "I rarely talk about my health condition" (reverse scored), "My spouse and I have frequent conversations about my health condition," and "How often do you talk with your spouse about your health condition?" CFA results revealed that all of the items loaded onto the latent construct,  $\chi^2(26) = 33.43, p = .15, CFI = .99, RMSEA = .04$ . The items were summed and averaged to form a composite measure of the frequency of disclosure with a spouse about a health condition with a higher score indicating more frequent disclosure ( $M = 3.07, SD = .88$ , range 1.00 to 5.00;  $\alpha = .84$ ) (see Table 9).<sup>8</sup>



## CHAPTER 4

### Results

Data determined to be missing completely at random (MCAR) were handled in two ways. First, if a single item in a scale was missing, the sample mean was entered. Second, if more than one item per scale was missing then listwise deletion was conducted such that a case with missing values was ignored in all subsequent analyses. Table 1 presents the zero-order correlation matrix for all variables. Results indicated that frequency of disclosure was negatively associated with self-focused prognosis uncertainty, other-focused prognosis uncertainty, self-focused symptom uncertainty, other-focused symptom uncertainty, relational quality, perceived partner support, and communication efficacy to partner. In addition, both breadth and depth of disclosure were positively associated with relationship-focused prognosis uncertainty and relationship-focused symptom uncertainty, and negatively associated with relational quality, perceived partner support, and communication efficacy to partner. Results also revealed that communication efficacy to partner was negatively associated with relational quality and perceived partner support.

Hypotheses were tested using maximum likelihood structural equation modeling (AMOS 17.0) because it provides the most parsimonious method of testing the model and hypotheses. The strategy accounts for measurement error in the data and makes it possible to assess hypothesized associations. Three goodness-of-fit indices gauge the fit of the CFA model. The  $\chi^2/df$  adjusts the  $\chi^2$  statistic for sample size (Kline, 1998). The CFI calculates the ratio of the noncentrality parameter estimate of the hypothesized model to the noncentrality parameter estimate of a baseline model (Bentler, 1990). The RMSEA

accounts for errors of approximation in the population (Browne & Cudeck, 1993). We determined that the model fit the data if  $\chi^2/df$  was less than 3, CFI was more than .90, and RMSEA was less than .10 (Browne & Cudeck, 1993; Kline, 1998). Results of the structural equation models are presented next.

### *Structural Equation Model Results*

The first step required calculation of the error variance ( $1-\alpha$ ) ( $\sigma^2$ ) of each variable to account for measurement error in the variables (Bollen, 1989; Stephenson & Holbert, 2003). Initial results indicated that the hypothesized model (see Figure 2) did not adequately fit the data,  $\chi^2(48) = 176.76$ ,  $p < .01$ ;  $\chi^2/df = 3.82$ ,  $CFI = .86$ ,  $RMSEA = .12$ . In order to improve the fit of the model, nonsignificant paths were removed, one at a time. Based on that criterion, two paths were eliminated (in this order): (a) the path from prognosis uncertainty to communication efficacy to partner, and (b) the path from symptom uncertainty to perceived partner support. The fit of the model was not significantly improved,  $\chi^2(50) = 178.10$ ,  $p < .01$ ;  $\chi^2/df = 3.46$ ,  $CFI = .86$ ,  $RMSEA = .11$ , because elimination of paths in structural equation analysis may not always result in an adequately fit model (see Knobloch et al., 2001). Next, paths were added to the model based on the magnitude of the modification indices and theory, such that suggested paths with the largest values were added before those with smaller values. In the present study, the modification indices identified two paths to be added to the model. The addition of a path from symptom uncertainty to frequency of disclosure and a path from prognosis uncertainty to breadth of disclosure resulted in a model that adequately fit the data,  $\chi^2(48) = 130.02$ ,  $p < .01$ ;  $\chi^2/df = 2.65$ ,  $CFI = .91$ ,  $RMSEA = .09$ . In addition, data for males ( $n = 126$ ) and females ( $n = 76$ ) were examined in a multi-level model. The  $\chi^2$  difference

statistic showed no significant difference between the unconstrained model and the equal-constrained model; therefore the model has measurement invariance across both males and females,  $\chi^2(150) = 322.89$ ,  $p < .01$ ;  $\chi^2(df) = 2.15$ ,  $CFI = .91$ ,  $RMSEA = .05$ .

The final model is presented in Figure 6. Results are consistent with some hypotheses concerning the factors influencing communication about a health condition. Prognosis uncertainty did not negatively predict communication efficacy to partner, as hypothesized in H1a. Symptom uncertainty positively, not negatively, predicted communication efficacy to partner (H2a not supported). H1b was not supported as prognosis uncertainty positively, not negatively, predicted perceived partner support. H2b was not supported, as symptom uncertainty did not predict perceived partner support. Consistent with H3, relational quality predicted perceived partner support. Additionally, perceived partner support positively predicted communication efficacy to partner (H4). Communication efficacy to partner positively predicted breadth of disclosure (H5), depth of disclosure (H6), and frequency of disclosure (H7). Finally, prognosis uncertainty positively predicted breadth, but not depth or frequency of disclosure (RQ1), and symptom uncertainty negatively predicted frequency, but not breadth or depth of disclosure (RQ2).

## CHAPTER FIVE

### Discussion

Chronic illness, such as a heart-related condition, is an important context for studying disclosure decision-making *beyond* initial disclosure because it raises the question of how uncertainty about chronic illness influences patterns of disclosure in established relationships. The DD-MM (Greene, 2009) was used as a framework for identifying the components of disclosure decision-making that might be influential in this context. Findings suggest that the key mechanisms identified in the DD-MM (i.e., assessment of information, relational quality, anticipated reaction, efficacy) influence the breadth, depth, and frequency of disclosure about a chronic health condition. The results of this study also revealed that uncertainty plays a prominent role in people's disclosures about their heart-related condition. The sections that follow will interpret the findings regarding the role of illness uncertainty in disclosure patterns, will discuss the implications of expanding the DD-MM beyond initial disclosure, will highlight the strengths and weaknesses of this investigation, and will propose areas for future research. This begins with assessing the information.

#### *Assessing the Information*

Research on disclosing personal or private information (e.g., Greene et al., 2009; see also Greene et al., 2006), health information (e.g., Greene et al., 2003), and secret information (Vangelisti & Caughlin, 1997; Vangelisti et al., 2001; Afifi & Steuber, 2009) has primarily focused on information valence (e.g., positive/negative, good/bad, risks/benefits). Greene's (2009) DD-MM moves beyond information valence and argues that uncertainty is an underlying feature of individuals' assessment of health information

in terms of five components (i.e., stigma, preparation, prognosis, symptoms, and relevance to others).

*Prognosis and Symptom Uncertainty*

This study specifically explored uncertainty about prognosis and symptoms of a heart-related condition, different from the DD-MM, and expands the uncertainty component. As anticipated, prognosis and symptom uncertainty were positively correlated such that greater perceived prognosis uncertainty was related to greater perceived symptom uncertainty. Moreover, because the experience of uncertainty in chronic illness (and the reasons for disclosing) reflect a self-, other-, and relationship-focus (e.g., Brashers, 2001; see also Greene et al., 2006), the present study examined how self-, other-, and relationship-related uncertainties influence patterns of disclosure to a partner about a chronic heart-related condition.

*Prognosis uncertainty and communication efficacy to partner.* Specifically, it was predicted that prognosis and symptom uncertainty negatively influence people's perceived ability to talk to their partner about a heart-related condition (H1a and H1b). H1a was not supported, as prognosis uncertainty did not directly predict communication efficacy to partner. However, the relationship between prognosis uncertainty and communication efficacy was mediated by perceptions of partner support. Although not hypothesized in this study, the mediation is consistent with the DD-MM's (Greene, 2009) prediction that the effect of negative information assessment on disclosure efficacy will be partly mediated by assessment of a potential receiver (e.g., anticipated response). Similarly, results of a first test of the DD-MM (Greene et al., 2009) on disclosing personal (not health) information (measuring information valence) revealed that

information assessment did not directly predict disclosure efficacy, but rather the relationship between information valence and efficacy was mediated by anticipated reaction variables (e.g., support, relational consequences), as hypothesized. However, a first test of the DD-MM assessing health information (Greene et al., 2010) found that perceived illness severity negatively predicted disclosure efficacy. The finding suggests that in initial decisions to disclose it may be especially difficult to tell others if a disease is progressing badly or is highly stigmatized (e.g., STIs). Results for the present study suggest, however, that under conditions of prognosis uncertainty perceptions of a partner's support is a salient factor influencing a person's ability to communicate to their partner about his/her heart condition. That is, people with a chronic heart condition may feel more able to talk to their partner about their concerns for the future because they perceive that their partner provides support. This is discussed further in the section on uncertainty and support.

*Symptom uncertainty and communication efficacy to partner.* Rather than negatively predicting communication efficacy to partner as hypothesized (H2a), symptom uncertainty positively predicted the ability to talk to a partner about one's heart-related condition. Thus, the more uncertain people were about whether symptoms of their health condition were noticeable (self-focused), whether their partner thinks others notice their health condition symptoms (partner-focused), and whether symptom visibility affects the relationship with their partner (relationship-focused), the more likely they were to perceive the ability to communicate with their partner about their condition. The finding is not surprising given that participants reported long-term relationships ( $M = 38.75$ ,  $SD = 15.62$ ) with their partner and high communication efficacy ( $M = 4.47$ ,  $SD = .61$ ). The

finding, however, is not consistent with Greene et al. (2010) such that illness severity negatively predicted disclosure efficacy, nor is it consistent with Afifi and Steuber's (2009) finding that assessment of risk associated with revealing a secret negatively predicted communication efficacy. On the other hand, information valence (e.g., Greene et al., 2009) did not directly predict efficacy. Thus, people's assessment of the information in terms of valence (Greene et al., 2009), specific health condition components (Greene et al., 2010), and uncertainty (present study) influences efficacy in different ways. How people respond to uncertainty, for example, is shaped by appraisals and emotional reactions to the experience (e.g., Babrow, 2001; Brashers, 2001). Although a person with a heart condition may experience uncertainty about whether his/her symptoms are noticeable to others, the perceived ability to talk about the condition with a long-term partner (and gather/seek information) is one way of managing uncertainty and explains the present study's finding (e.g., Afifi & Weiner, 2004).

One possible explanation for why symptom uncertainty, but not prognosis uncertainty, directly predicted communication efficacy might be that people appraise uncertainty about symptom visibility more proximally. Disclosure decision-making involves incorporating proximal factors such as self-, other-, and relationship-focused reasons for and against disclosure (Greene et al., 2006). Similarly, appraisals of uncertainty are self-, other-, and relationship-focused (Babrow, 2001; Brashers, 2001). A person with congestive heart failure may be experiencing uncertainty about whether symptoms related to his/her condition (e.g., slower gait, difficulty breathing, hacking cough, or excessive perspiration) are noticeable (self-focused uncertainty), whether his/her partner thinks that symptoms are noticeable (other-focused uncertainty), and

whether symptom visibility creates challenges for the partners' relationship (relationship-focused). Talking about visibility of physical symptoms may be face-threatening such as fear of appearing weak (see Greene, 2009). Unlike prognosis uncertainty however, perceptions of partner support did not mediate the relationship between symptom uncertainty and communication efficacy. The finding suggests that the ability to communicate to a partner is a more salient (and proximal) factor for people experiencing uncertainty about symptom visibility than is a partner's supportive response.

On the other hand, individuals might appraise uncertainty about their prognosis more distally. Personality and individual differences (e.g., being supportive, understanding) of the discloser and disclosure target are examples of distal factors influencing disclosure decision-making (Greene et al., 2006). The findings provide support for the DD-MM's notion that disclosure uncertainty plays a role in health disclosure decision-making. Taken together, people's appraisals of prognosis and symptom uncertainty influence efficacy and disclosure decision-making in unique ways. In assessing health information, symptom uncertainty but not prognosis uncertainty rendered a person more confident in his/her ability to communicate to a partner (directly) about a heart-related condition.

#### *Prognosis and Symptom Uncertainty and Depth, Breadth, and Frequency of Disclosure*

The DD-MM argues that disclosure efficacy plays a key role in individuals' disclosure decisions such that after assessing information and a potential receiver, individuals next evaluate their ability to enact disclosure. Because the present study focused on people in a relationship who are managing a chronic heart-related condition, two research questions asked whether uncertainty about prognosis or symptoms directly



predicted breadth, depth, and/or frequency of disclosure with a partner about the condition. That is, the questions sought to explore whether there are situations in which individuals' communication efficacy is not a factor in ongoing disclosure decisions.

*Prognosis uncertainty and breadth.* Results of RQ1 indicated that prognosis uncertainty directly (and positively) predicted *breadth of disclosure*. People who reported uncertainty about their prognosis with a heart-related condition were more likely to report that they talk to their partner about a range of topics related to the health condition. Although individuals experiencing illness uncertainty may have difficulty expressing their emotions and avoid communicating (e.g., Goldsmith, 2009), the findings of the present study suggest that uncertainty about the future with a heart-related condition actually encourages disclosure breadth. This finding is consistent with Omarzu's (2000) argument that as subjective utility of a disclosure reward increases (e.g., obtaining support from a relational partner) the sheer amount of disclosure such as the number of topics will increase, indicating an increase in effort or persistence in reaching one's goal. Further, recall the previous discussion in which prognosis uncertainty positively predicted communication efficacy (through partner support). Because individuals experiencing uncertainty may devise a more efficient plan to accomplish goals (Berger, 1997, 2008), there may be times when uncertainty concerning one's future with a heart condition motivates people to talk about numerous topics related to their health condition, regardless of whether they perceive the ability to talk to a partner about their condition. They might also need support and have high hopes that a partner will provide it (e.g., Babrow, 2007). Further, for individuals experiencing prognosis

uncertainty, disclosing about a range of topics might facilitate catharsis, a mechanism for individuals to relieve stress associated with managing a chronic heart-related condition.

*Symptom uncertainty and frequency.* Results also indicated that symptom (not prognosis) uncertainty negatively predicted *frequency of disclosure* to a partner about a chronic health condition (RQ2), such that people who reported uncertainty about their symptoms being visible to others also reported less frequent talks with their partner about their health condition. The finding is supported by research indicating that people appraise illness uncertainty in different ways (e.g., Mishel & Clayton, 2003). For example, a study of patients with atrial fibrillation (rapid heart rate) found that individuals with greater symptom severity perceived more uncertainty and appraised it as a danger rather than opportunity (Kang, 2005). Uncertainty appraisals, in turn, influence how people manage uncertainty (e.g., Babrow, 2007; Brashers, 2007; Goldsmith, 2009). For example, following one partner's myocardial infarction (heart attack), some couples engage in "protective buffering" in which they hide their concerns from their partner to avoid upset or conflict (see Goldsmith, 2009; see also Coyne & Smith, 1991, 1994; Suls, Green, Rose, Lounsbury, & Gordon, 1997).

Thus, the finding for disclosure frequency is consistent with prior research indicating that people experiencing uncertainty in relationships avoided discussion of sensitive subjects within cross-sex friendships (Afifi & Burgoon, 1998), dating relationships (Knobloch & Carpenter-Theune, 2004), and family relationships (Afifi & Schrodt, 2003). Although the present study investigated illness uncertainty (not relational uncertainty), there are many different forms and meanings of uncertainty (e.g., Babrow, 2009). Whether uncertainty is about one's illness (e.g., prognosis or symptoms) or about

a relationship, uncertainty gives rise to instability and challenges predictability (Greene, 2009; see also Babrow, 2009). Further, people manage uncertainty by information seeking, avoiding, or maintaining their current level of knowledge (e.g., Brashers, 2001).

Interestingly, neither prognosis uncertainty nor symptom uncertainty directly predicted depth of disclosure. Omarzu (2000) argued that of the three disclosure dimensions (i.e., breadth, duration, depth), depth of disclosure is the most vulnerable to risk. For example, although a person who discloses frequently about a range of topics related to a health condition may be annoying to his/her partner, revealing too intimately may have immediate and aversive consequences for the discloser (e.g., a partner may be disgusted). As subjective risk increases, depth of disclosure decreases. The findings of the present study suggest, however, that under conditions of prognosis and symptom uncertainty, DD-MM (Greene, 2009) components such as assessment of a receiver (e.g., anticipated reaction) and efficacy play a more prominent role in the depth of people's ongoing disclosures. The next section will discuss findings related to a receiver.

### *Assessing the Receiver*

After assessing a piece of health information and relational quality, the revised DD-MM (Greene et al., 2010) proposes that the next step in the disclosure process is to assess anticipated reaction (e.g., support, consequences for the relationship) to a disclosure. That is, individuals evaluate the benefits/risks involved in sharing the information with a particular target. The next sections will review findings for the effect of prognosis uncertainty, symptom uncertainty, and relational quality on anticipated support (i.e., perceived partner support).

### *Prognosis Uncertainty and Anticipated Support*

The hypothesis that prognosis uncertainty would negatively predict perceptions of partner support (H1b) was not supported. That is, people who reported uncertainty about their future with a heart-related condition were likely to report that their partner provided support (a positive, not negative path). The experience of relational uncertainty has been linked with more intense reactions to appraisals of irritations (Solomon & Knobloch, 2004; Theiss & Solomon, 2006b), jealousy (Knobloch et al., 2001; Theiss & Solomon, 2006a), and the experience of hurt in romantic relationships (Theiss et al., 2009). Yet, the finding suggests that people in long-term relationships who experience prognosis uncertainty related to a heart condition also perceive that their partner provides them with support.

Although prior research confounded uncertainty and anxiety (e.g., Gudykunst, 1995), current research suggests that responses to uncertainty are not always associated with negative emotions or outcomes (Goldsmith, 2009; see also Brashers, 2001; Mishel, 1999; Mishel & Clayton, 2003). That is, negative emotional responses may occur if uncertainty is viewed as a threat or danger (e.g., anger or frustration about curtailed activities following a heart attack), whereas, positive emotional responses may surface if uncertainty is viewed as an opportunity (e.g., increased optimism, new lease on life following coronary artery bypass graft surgery). However, evaluations of uncertainty can become problematic as a person encounters new or conflicting information such as perceived ambiguous responses from a partner (e.g., Babrow, 2001, 2007). Further, as individuals managing chronic illnesses encounter new health information, the uncertainties surrounding the information (and expectations of a partner's response) are

likely to influence their decision to disclose the information to a partner. Thus, the dynamic nature of the disclosure process is especially salient in the context of managing a chronic health condition.

### *Symptom Uncertainty and Anticipated Support*

Findings for H2b were not supported, as symptom uncertainty did not predict perceived partner support. That is, there was no relationship between uncertainty about the visibility of symptoms of a person's heart-related condition and perceptions of partner support. It may be that partner support is more salient when people are concerned about their future with a heart-related condition than it is for uncertainty about symptom visibility. Or, it might be that a person experiencing uncertainty about symptom visibility solicits support from people other than a partner, such as a close friend.

In the first test of the DD-MM specifically with health information, Greene et al. (2010) reported slightly different findings from the present study. In Greene et al. participants reported on one person to whom they had disclosed health information and another to whom they had not disclosed the same health diagnosis. The five assessment information components loaded onto two latent variables. In the first (undisclosed) model, *symptoms* (i.e., symptoms, preparation, and relevance to others) did not predict anticipated response support as hypothesized. Rather, people's assessment of *symptoms* negatively predicted anticipated outcomes such as relationship consequences of sharing the health information. That is, in a second model of people's reports of sharing health information with another person (disclosed model) Greene et al. found that *symptoms* negatively predicted perceptions that a partner was responsive to the disclosure. The present study of people in long-term relationships with chronic heart-related conditions suggests that

symptom visibility might be considered more stable (and requiring less support) while prognosis uncertainty continues to create anxiety for a patient and his/her partner.

Regardless, continued research should explore this finding for symptom uncertainty and perceived partner support.

### *Relational Quality and Anticipated Support*

The hypothesis that relational quality positively predicts perceived partner support (H3) was supported. That is, individuals who are close to their partner and are satisfied with the relationship are more likely to perceive that their partner provides them with support they need. The finding is consistent with prior disclosure literature that people disclose to people with whom they are close, they can trust, and who will support them (e.g., Greene et al., 2006; Greene et al., 2003; Petronio, 2002; Vangelisti, et al., 2001).

Additionally, the result supports recent tests of the DD-MM in which relational quality positively predicted anticipated response (support) to disclosure of personal information (Greene et al., 2009) and health information (Greene et al., 2010), respectively. For Greene et al. (2009) relational quality positively predicted perceptions that a dyadic partner would be supportive to disclosure of personal information, consistent with general disclosure literature. Greene et al. (2010) examined people's reports of disclosed and undisclosed health information. For the *undisclosed* model, relational quality positively predicted anticipated (response) support for *severity* of health information (i.e., stigma and prognosis), but not for *symptoms* (i.e., preparation, relevance, and symptoms) related to the health information. Similarly, the *disclosed* model indicated that relational quality positively predicted a target's responsiveness to

the disclosure for *severity* of information but not *symptoms* related to the health information. Thus, the finding of the present study that relational quality is a strong predictor ( $r = .64$ ) of perceptions of partner support for people managing heart-related conditions is consistent with the recent DD-MM and other disclosure studies (e.g., Afifi & Olsen, 2005; Afifi & Steuber, in press). Next, findings for anticipated support and efficacy are discussed.

### *Communication Efficacy*

#### *Anticipated Support and Communication Efficacy to Partner*

The DD-MM posits that, after assessing a receiver in terms of the quality of the relationship and anticipated reaction, individuals are likely to assess their disclosure efficacy (i.e., perceived ability to enact disclosure). The current study of patterns of disclosure under conditions of uncertainty hypothesized that perceptions of partner support positively predict communication efficacy (H4). The hypothesis was supported, as participants who reported that their partner provides them with support were also more likely to perceive the ability to talk to their partner about their heart-related condition. The finding is not surprising considering that the average length of participants' relationship with their partner was 39 years and participants' average age was 68. Moreover, there was little variance in participants' reported communication efficacy (e.g.,  $M = 4.47$ ,  $SD = .61$ ).

On the other hand, recent tests of the DD-MM of disclosure to varied people (e.g., friend, family member) in shorter-term relationships suggest differing results. For example, Greene et al. (2009) measured anticipated reactions in terms of anticipated response (i.e., support) and anticipated outcomes (i.e., relational consequences) and found

that anticipated response did not directly predict disclosure efficacy. Rather, the relationship between anticipated response and communication efficacy was mediated by anticipated outcomes such as perceived relational consequences. Participants in Greene et al. (2009) reported on personal (not health-related) information that they had not yet shared with a dyadic partner. Variance for the efficacy measure ( $M = 3.65$ ,  $SD = .81$ ) was higher than variance in the present study suggesting that participants in Greene et al. were less confident in their ability to disclose the information to their dyadic partner, this is not surprising, given that the average length of the relationship was 4 years (range one month to 36 years). Similarly, Greene et al.'s (2010) study of disclosed and undisclosed health information indicated varied results for efficacy ( $M = 3.63$ ,  $SD = .94$ ; average length of relationship = 9.5 years). For undisclosed information, anticipated response did not directly predict disclosure efficacy. Rather, consistent with Greene et al. (2009), anticipated outcome (and confidence in other's response) mediated the relationship between anticipated response and disclosure efficacy. In the disclosed model, relational outcomes again mediated the relationship between anticipated response and disclosure efficacy. Thus, anticipated support and anticipated outcomes for the relationship influence people's disclosure efficacy in varied ways. Overall, the findings for support and disclosure efficacy in the present study suggest that as people age they become more confident in their ability to share information with a long-term, supportive partner. Future models of disclosure in aged populations should reconsider including efficacy as a variable. People may perceive the ability to talk to a partner about their health condition, but they may simply prefer to avoid disclosing about certain topics.



One caveat, however, is that the present study measured one response variable, namely *perceived partner support* (with items similar to anticipated response), to reflect the ongoing nature of sharing personal health information in close relationships. It was determined that anticipated outcome and confidence in response variables are more relevant to initial, rather than subsequent disclosure, and for disclosures in varied relationships, rather than disclosure to a long term partner. Having a single more limited measure of anticipated reactions, however, likely explains the direct path from perceived partner support to communication efficacy in the current study. Going forward, more research is needed to distinguish additional response variables relevant to ongoing disclosure for people in relationships who are managing chronic health conditions.

Reis and Shaver's (1988) interpersonal process model of intimacy (IPMI), for example, suggests that both self disclosure and partner responsiveness contribute to the experience of intimacy in interactions. Partner responsiveness is the degree to which a discloser feels understood, accepted, and cared for by the disclosure recipient (see Laurenceau et al., 1998; Manne et al., 2005, 2006). A recent study by Magsamen-Conrad et al. (2010), for example, utilized the DD-MM to explore how partner responsiveness and other response variables influenced the effect (on relationships) of disclosing personal information (Study 1) and health information (Study 2). Results of both studies indicated that participants' perceptions of a disclosure recipient's responsiveness positively influenced their relationship. This is consistent with previous research on the IPMI that demonstrates the important role of responsiveness in the process of building intimacy (see Laurenceau, Feldman Barrett, & Pietromonaco, 1998; Manne et al., 2004). For example, Manne et al. (2004) tested the IPMI with breast cancer patients and found

that a partner's disclosure (e.g., reciprocity) predicted patient feelings of intimacy, because this type of disclosure was associated with greater feelings of acceptance, understanding, and caring.

Even after initial disclosure of health information to a partner (e.g., "The doctor said I need a heart catheterization") people continue to make disclosure decisions regarding related information. Moreover, perceptions of partner responsiveness to disclosures of health information are likely to influence patients' subsequent disclosures (e.g., depth, breadth, and frequency of disclosure).<sup>10</sup> Thus, future research should consider measuring the role of response variables (e.g., perceived partner responsiveness) on people's communication efficacy.

*Communication Efficacy to Partner and Depth, Breadth, and Frequency of Disclosure*

Expectations or beliefs about one's ability to perform actions necessary to produce particular effects have predicted a variety of health-related outcomes (e.g., Bandura, 1997; Holden, 1991; O'Leary, 1985; Strecher et al., 1986). The current study explored the role of efficacy on people's communication about a chronic health condition. Specifically, it was predicted that people who perceive that they have the ability to disclose to their partner about their heart-related condition are likely to report more depth, breadth, and frequency of disclosure. Not only were all three hypotheses supported, but the correlations were strong ( $r = .54, .56, \text{ and } .26$ , respectively).

It is only recently that the role of efficacy has been considered in disclosure models. For example, Afifi and Steuber's RRM (2009) utilized *communication* efficacy in relation to revealing secrets, while *disclosure* efficacy is a main component of health disclosure decision-making in the DD-MM (Greene, 2009; see also Greene et al., 2009;

Greene et al., 2010). Afifi and Steuber (2009) found that the greater participants' communication efficacy, the more likely they were to reveal their secret. Additionally, communication efficacy predicted the use of specific strategies to reveal secrets including incremental disclosures which is similar to the present study's depth of disclosure (discussed further in the next section). Disclosure efficacy positively predicted likelihood of disclosure of private information in Greene et al. (2009) and undisclosed health information in Greene et al. (2010). For the disclosed health information model (Greene et al., 2010), disclosure efficacy negatively predicted depth of disclosure. That is, people with higher disclosure efficacy reported less depth when sharing the health information with a disclosure recipient. Greene et al. suggested that people with high efficacy may not perceive the need for great depth of disclosure perhaps because they anticipate a positive response, positive outcome, or both. The present study expands the role of efficacy beyond initial disclosure (e.g., a diagnosis, a secret) to encompass patterns of disclosure of health information for people managing chronic heart-related conditions. The subsections that follow address the findings for each disclosure variable, beginning with depth of disclosure.

*Communication efficacy and depth of disclosure.* People who perceived that they had the ability to talk to their partner about their heart-related condition reported having in-depth talks and sharing intimate issues with him/her. The finding is consistent with social penetration theory's (Altman & Taylor, 1973) notion that in the final stage of relationship development, people share information that is at central core, such as innermost fears, needs, and values. The results support research that length of romantic interest (i.e., for dating partners) is positively associated with the depth of relationship

talk (Knobloch et al., 2006). Moreover, the results are consistent with research indicating that people in established relationships (e.g., married couples) build intimacy through sharing in-depth information such as private thoughts, dreams, attitudes, and beliefs (Lippert & Prager, 2001; Prager, 1995; Waring et al., 1980). The finding is in contrast, however, to Greene et al. (2010) in which higher perceived efficacy predicted less depth of disclosure. Although higher efficacy may mean that a person has no need to disclose in depth because s/he expects a positive response, it can also mean that a person avoids in-depth disclosure because it is risky. Afifi and Steuber (2009) for example, found that when people perceived that they had the ability to reveal a secret they reported less use of incremental disclosures (e.g., revealing bits and pieces to gauge a person's reaction). Regardless, the present study implies that for people managing a chronic heart-related condition, being able to talk to a partner about the condition is a strong predictor of how intimately individuals do talk about it.

*Communication efficacy and breadth of disclosure.* Communication efficacy to partner also positively predicted that individuals would talk about a range of topics related to the chronic health condition. That is, people who perceived the ability to talk to a partner about their heart-related condition also reported communicating about a wide variety of issues related to the condition, were likely to share even small health concerns, and were less likely to avoid discussing particular topics related to the condition. Although prior research suggests that spouses have difficulty talking about certain health topics, such as cancer-related concerns (e.g., Badr & Taylor, 2006; Donovan-Kicken & Caughlin, 2009; Goldsmith et al., 2006), topic avoidance is a common relational event (Afifi & Guerrero, 1998; Baxter & Wilmot, 1985; Caughlin & Afifi, 2004) and has been

linked with marital satisfaction (e.g., Donovan-Kicken & Caughlin, 2009; Finkenauer & Hazam, 2000). That is, even people who are satisfied in a relationship avoid discussing certain topics. Findings of the present study indicate that the perceived ability to communicate about a health condition is a strong predictor of people's perceptions that they do talk about a range of topics related to their condition. Yet, it is also possible that people replace disclosure *depth* with disclosure *breadth* to avoid communication about critical issues (see Derlega & Chaiken, 1977), as is suggested by the direct path from prognosis uncertainty to breadth (but not depth) of disclosure and the negative path from symptom uncertainty to frequency (discussed in previous sections). According to CPM theory (Petronio, 2002), people adjust their privacy rules about when to share (e.g., access rules) and when not to share (e.g., boundary protection rules) their private information as a way to control the risks of disclosure. It may be that experiencing prognosis and symptom uncertainty prompts people to change the privacy rules surrounding their heart-related condition and influences their disclosure patterns as well.

Preliminary findings based on an open-ended question (not reported in the current study) suggest that although participants reported high breadth of disclosure, there are certain topics that they avoid talking about with their partner such as sexual issues, fears about dying, and issues that are perceived as minor (e.g., aches and pains). Donovan-Kicken and Caughlin (2009) found that the association between topic avoidance and relationship satisfaction was moderated by patients' own reasons for avoidance and by perceptions of partners' reasons for avoidance. Couples managing cancer may find that talking about topics like death is especially challenging (Goldsmith et al., 2007). Thus, we need to examine not just what topics are avoided but their content and why.

As prior research suggests, healthy relationships are often characterized by a balance between openness and closedness (Afifi et al., 2007; see also Baxter, 1990; Baxter & Montgomery, 1996; Greene et al., 2006; Greene et al., 2003; Petronio, 2002). Thus, although people may report communication efficacy to a partner about a variety of issues related to a health condition, in reality they also engage in a certain amount of functional topic avoidance. Continued research should examine the kinds of information that people in quality long term relationships (who are managing chronic health conditions) avoid discussing and the benefits and drawbacks of their decisions.

*Communication efficacy and frequency of disclosure.* Finally, the perceived ability to communicate to a partner about a heart-related condition positively predicted that individuals often talk about their health condition. The correlation between communication efficacy and frequency of disclosure ( $r = .26$ ), however, was not as strong as the correlations between efficacy and breadth ( $r = .56$ ) and efficacy and depth ( $r = .54$ ) suggesting that disclosing often may not be as germane to subsequent disclosures as are breadth and depth in long-term relationships. In developing relationships, disclosing too much information too soon violates norms of reciprocity (e.g., Chaiken & Derlega, 1974a, 1974b; Berg & Archer, 1980). Frequent disclosures (or disclosures of long duration) at the beginning of a relationship may be annoying to others, but they are less risky for the discloser than revealing too intimately (Omarzu, 2000). People in longer-term relationships who know each other well, however, may make less negative attributions about a partner's disclosures, especially if the disclosures are self- focused (e.g., "I don't know why I am so worried all of the time") or relationship-focused (e.g., "We both need to start exercising") (e.g., Derlega et al., 1993). For example, a husband

might attribute his wife's persistent disclosures to anxiety about an upcoming diagnostic test (e.g., blood work, stress test).

Frequency of disclosure about a person's illness has been shown to help patients (and their partners) manage health conditions such as cancer and heart disease (e.g., Krant & Johnston, 1978; Rohrbaugh et al., 2001; Wortman & Dunkel-Schetter, 1978). Rohrbaugh et al. (2001), for example, found that marital quality (which included a measure of frequent "useful discussions") is an important predictor of survival for patients diagnosed with heart disease. Findings for the present study suggest that people managing a chronic heart-related condition who perceive the ability to talk to a partner are likely to have frequent discussions about their health condition. Questions for future research are "how much is too much" and at what point does communication about a chronic health condition such as a heart-related disease take over people's conversations and life (see Goldsmith, 2009).

*Summary.* To summarize, results indicate that communication efficacy to partner predicted people's ability to talk to a partner in depth, about a range of topics, and frequently about a heart-related condition. Future research, however, should explore the effects of disclosure on health outcomes, such as health decision-making and uncertainty management, for people with heart-related and other chronic health conditions.

### *Implications*

Many people are managing chronic health conditions such as diabetes, heart disease, and some forms of cancer and are making habitual disclosure decisions about sharing information regarding their condition. Little research, however, has explored disclosure decision-making beyond initial revelation. The goal of this research was to

provide a better understanding of the factors influencing people's patterns of disclosure under conditions of illness uncertainty. The following sections will address both theoretical and practical implications of the results of this study.

### *Theoretical Implications*

Theoretical contributions of this study have implications for theory-building and future research in several areas including disclosure and the DD-MM, illness uncertainty, research on communication in longer-term relationships, and for theorizing about disclosure, relationships, and uncertainty in health contexts. Implications for disclosure and the DD-MM will be considered first.

*Implications for disclosure and the DD-MM.* Self-disclosure is an important element in the development and maintenance of interpersonal relationships (e.g., Altman & Taylor, 1973), and is associated with greater satisfaction for marital (Burke et al., 1976; Fincham & Bradbury, 1989; Finkenauer & Hazam, 2000; Hansen & Schuldt, 1984; Jorgensen & Gaudy, 1980) and cohabiting couples (Lippert & Prager, 2001). Results of the present study contribute to the vast body of disclosure literature by examining the role of disclosure for people in longer-term relationships who are managing a chronic health condition. Disclosure is more likely to emerge in certain types of relational environments such as those fostering intimacy through self-disclosure (e.g., Derlega et al., 1993). Indeed, findings of this study suggest that being in a satisfying, supportive relationship is predictive of people's ability to disclose their concerns to their partner about a heart-related condition.

More specifically, the current study utilized the DD-MM (Greene, 2009) as a framework for exploring patterns of disclosure (beyond initial disclosure) for people



managing uncertainty surrounding heart-related conditions. Findings provide support for the key components identified in the revised DD-MM (Greene et al., 2010) predicting decisions to disclose information. In the present study, assessment of information (i.e., prognosis and symptom uncertainty), relational quality, assessment of a receiver (i.e., perceived partner support), and communication efficacy were found to predict patterns of disclosure (i.e., depth, breadth, and frequency) of health information. Similar to recent tests of the DD-MM, anticipated response variables (i.e., *perceived partner support*) play a mediating role in the disclosure decision-making process.

One difference in the present study is that the DD-MM posits that assessment of information, relational quality, and assessment of a receiver (e.g., anticipated response support, relational consequences) predict disclosure efficacy which, in turn, predicts disclosure/nondisclosure (or intentions to disclose). Results of the present study, however, demonstrated direct paths from prognosis uncertainty to breadth of disclosure (not mediated through communication efficacy) and from symptom uncertainty to frequency of disclosure (and through communication efficacy). Thus, illness uncertainty may change people's patterns of disclosure such that communication efficacy is less important in certain situations. On the other hand, efficacy could simply function differently in longer-term relationships. Perceived communication efficacy, however, positively predicted the depth, breadth, and frequency of people's disclosure about their heart-related condition. Little prior research has explored the role of efficacy in disclosure decision-making (see, however, Afifi & Steuber, 2009; Greene, 2009; Greene et al., 2009; Greene et al., 2010). Therefore, the results contribute to the growing body of

research on the role of efficacy in enacting behavior, and future models should include efficacy measures.

In future research, however, it is important to consider how the DD-MM fits into broader approaches to understanding health issues. Disclosure is a dynamic process that repeats itself and changes over time and is part of a larger coping mechanism for dealing with an illness. Disclosure has been suggested as a means for enhancing health, self-esteem, and the ability to cope (e.g., Derlega et al., 1993). For example, breast cancer patients who confide fears and concerns to supportive others, such as spouses or close friends, tend to fare better emotionally (see Albrecht & Goldsmith, 2003). Moreover, low levels of disclosure and high levels of holding back were associated with poorer relationship functioning for patients with gastroenterologic cancer and their spouses (Porter et al., 2005). Thus, future research should continue to examine patterns of disclosure in association with illness experiences.

It is possible, for example, to look across different theories of behavior change such as the theory of planned behavior (TPB; Azjen, 1985) for an even more parsimonious model to explain the disclosure process in the context of illness uncertainty (see Figure 7). TPB suggests that perceived behavioral control (e.g., communication efficacy) combines with attitude and subjective norm components (e.g., illness uncertainty, relational quality, and perceived partner support) to predict behavioral intention (disclosure depth, breadth, and frequency) (see Hale, Householder, & Greene, 2002). Results of testing this alternate model (see Figure 8), however, did not indicate a good fit,  $\chi^2/df = 6.91$ ,  $CFI = .87$ ,  $RMSEA = .17$ .

The DD-MM explains the factors influencing people's decisions to share health information. Because there are health benefits of disclosure (e.g., Lepore, Ragan, & Jones, 2000; Pennebaker & Beall, 1986; Smyth, 1998; see Frattaroli, 2006 for a review), disclosure models (or portions thereof) like the DD-MM can be incorporated into broader theories of self-regulation such as the common sense model (CSM; Leventhal, Brissette, & Leventhal, 2002). The CSM proposes that people are active problem-solvers who make sense of a threat to their health, such as physical symptoms or an illness (similar to DD-MM's assessment of five components or Babrow's PI theory) by developing their own cognitive representations of the threat, which, in turn, determine how they respond. Similarly, the DD-MM argues that individuals assess a receiver and their ability to disclose in determining whether or not to enact disclosure. People tend to disclose (and perceive the ability to disclose) to those with whom they have a good relationship and can trust. Thus, disclosing health information to another person could be considered a *coping procedure/action plan* as depicted in the CSM which posits that people develop procedures to eliminate and control potential or ongoing illness threats (Leventhal et al., 2002). People have reasons for sharing health information (e.g., catharsis, obtaining support from significant others) which, in turn, facilitate the management (i.e., *regulation*) of their health condition. People's patterns of disclosure (e.g., depth, breadth, and frequency) and the health disclosure decision-making process, in general, should be viewed as valuable components of more global approaches to health issues warranting continued research.

*Illness uncertainty implications.* Another theoretical contribution of the present study is its expansion of uncertainty as an underlying feature of health disclosure

decision-making (Greene, 2009) by conceptualizing and operationalizing two of the DD-MM's assess information components (i.e., prognosis and symptoms) and testing their role in the disclosure decision-making process. The study demonstrates that prognosis and symptom uncertainty influence key variables in the process of disclosure decision-making and directly predicted two indicators of disclosure regarding a heart-related condition. Interestingly, of the three prognosis uncertainty subfactors (i.e., self-, other-, and relationship-focused), relationship-focused was most strongly and positively correlated with relational quality, perceived partner support, communication efficacy, depth, and breadth of disclosure (see Table 1). That is, people who reported more uncertainty about the effects of a heart condition on their relationship were more likely to perceive a high quality relationship, a supportive partner, and the ability to disclose to his/her partner in depth and breadth. Similarly, relationship-focused symptom uncertainty was more strongly correlated with communication efficacy, breadth, and depth of communication than were self- or other focused symptom uncertainty. The more uncertain a person was about the visibility of symptoms affecting his/her relationship, the more likely the person was to report that his/her partner provides support and to perceive the ability to disclose in-depth about a range of topics related to a heart condition.

Illness uncertainties may create doubts about the relationship which then positively bias individuals' perceptions of partner support and their ability to disclose about their condition. Solomon and Knobloch (2001) defined relationship uncertainty as "questions people have about the nature of an interpersonal association" which is viewed as distinct from uncertainties that arise from self-focused and partner-focused doubts (p. 807). In a test of the relational turbulence model on the consequences of jealousy

experiences, Theiss and Solomon (2006a) found that relational uncertainty (more than self or partner uncertainty) was a more robust predictor of communicative reactions to jealousy, suggesting that there may be distinctions among the specific sources of uncertainty. Perhaps uncertainty about the effects of a heart condition on one's relationship with a partner makes a person more reactive to the circumstances, and thus s/he perceives a more favorable situation (e.g., more supportive, quality relationship). On the other hand, the nature of the relationship between long-term partners itself may explain the findings. Badr and Acitelli (2005), for example, found that it is important for couples managing chronic illness to take a relationship perspective. Specifically, their findings suggested that relationship talk is a potentially useful tool couples can use in their repertoire of relationship enhancing behaviors during chronic illness. Further, Rohrbaugh et al. (2008) found that heart failure patients experienced positive changes in heart failure symptoms (over a six month period) when the spouse, but not the patient, demonstrated a communal orientation to coping marked by first-person plural pronoun use (i.e., "we" talk). Thus, because participants reported being in high quality, supportive, and long-term relationships ( $M = 38.75$ ,  $SD = 15.62$ ), it is not surprising that relationship uncertainty was disproportionately important for the mediators and outcomes being assessed. Future research, however, should consider examining self-focused, other-focused, and relationship-focused illness uncertainties independently.

Another contribution of the present study is creation of initial scales to quantitatively measure uncertainty about prognosis and symptoms surrounding a person's heart-related condition. Prior research suggests that the experience of uncertainty plays a role in people's management of acute and chronic health conditions (e.g., Babrow, 2007;

Mishel & Clayton, 2003; Brashers, 2001; Goldsmith, 2009). Yet, no known studies to date have quantitatively tested the role of uncertainty in people's disclosure about their health condition. People's appraisal of uncertainty can be negative, positive, or neutral (e.g., Brashers, 2001). The results of this study indicate that people's assessment of uncertainty surrounding their prognosis directly and positively predicted breadth of disclosure. The finding suggests that people who had (self-, other-, and relationship-focused) concerns about their future with a chronic, heart-related condition reported talking to their partner about a wide variety of topics related to the health condition, regardless of their perceived ability. As discussed previously, it may be that people disclose about a range of topics about which they are comfortable while avoiding in-depth talk about topics that are perceived as more sensitive or private. It may also be that there are more topics associated with prognosis uncertainty requiring disclosure than there are with symptom uncertainty.

Disclosure patterns for symptom uncertainty were slightly different in that assessment of uncertainty about symptom visibility directly and negatively predicted frequency of disclosure about a heart-related condition. Thus, when people had (self-, other-, and relationship-focused) concerns about whether symptoms of their heart-related condition were noticeable, they reported disclosing less frequently to a partner about their health condition, regardless of their perceived ability. The extent of perceived visibility of symptoms may prompt an individual to more tightly control the boundaries of his/her private information (e.g., Petronio, 2002). A husband who reveals that he feels like "a marked man" after a heart attack may not wish to disclose frequently about his uncertainties despite the ability to communicate about other topics related to his heart

condition (e.g., progress in making diet and exercise changes). Thus, people's appraisals of prognosis and symptom uncertainty influence their disclosure decisions.

Research should continue to examine people's appraisals of prognosis and symptom uncertainty to better explain why their appraisals influenced disclosure patterns differently. Although the present study measured people's concerns about their future and symptom visibility, it may be the content of their uncertainties that influences their decisions to disclose (or not) in-depth, frequently, and about a range of topics.

Additionally, researchers should continue measuring the various forms of uncertainty experienced by people with chronic illnesses. Concern about being stigmatized, for example, is likely to influence the disclosure decision-making process in terms of a person's relationship with his/her partner, perceptions of partner support, efficacy, and patterns of disclosure about the health condition. Badr and Taylor (2006) found that lung cancer patients and spouses reported trouble discussing continued tobacco use, cancer-related symptoms, prognosis, and the emotional effects of lung cancer on the spouse. Similarly, a person with congestive heart failure who was (or is) a cigarette smoker may feel stigmatized by his/her partner and avoid communication about the health condition. Thus, continued development of more sophisticated measures of uncertainty surrounding chronic health conditions is necessary for better understanding of not only the role of uncertainty in disclosure decision-making, but also its role in the management of health conditions such as lung cancer and heart failure. Health benefits of disclosure (in general) are well-documented (e.g., Lepore, Ragan, & Jones, 2000; Pennebaker & Beall, 1986; Smyth, 1998; see Frattaroli, 2006 for a review); yet continued research should investigate

how people's patterns of disclosure influence health outcomes (e.g., a *well-managed* heart-related condition) and behaviors (e.g., smoking cessation or increased exercise).

*Implications for research on communication in longer-term relationships.* The present study has implications for communication theory in its exploration of perceived communication behaviors (i.e., patterns of disclosure) for people in longer-term relationships. Dominant communication theories such as SPT (Altman & Taylor, 1973) and URT (Berger & Calabrese, 1975) continue to be useful for investigating communication in relationship development and initial interactions, respectively (e.g., Gibbs et al., 2006; Gordon et al., 2000). They are less useful, however, for furthering our understanding of the role of communication in more established (e.g., longer-term) relationships. Such research is necessary because Americans are living longer and with attendant health consequences. Life expectancy in the U.S. is 78, an all-time high (CDC.gov). Moreover, in terms of relationships, compared with unmarried people, married men and women tend to have lower mortality, more monitoring of health, and more compliance with medical regimens (CDC.gov). Although the RTM (Knobloch & Solomon, 2004; Solomon & Knobloch, 2004) has recently been utilized to explore relational uncertainty in longer-term relationships such as marital contexts (e.g., Knobloch, 2008; Knobloch et al., 2007), we need more studies (and perhaps more models/theories) of this kind. CPM theory (Petronio, 2002), for example, is a vast framework for understanding how people manage private information in health, marital, family, and organizational contexts but it has not been utilized to date for predicting the factors influencing people's communication in established relationships.



In the present study of patients with heart-related conditions, respondents reported long-term, supportive, and quality relationships with their partner. Americans may be living longer, but many are also managing chronic health conditions that create stress for even the most stable, long-term relationships. It is imperative, therefore, that researchers continue to refine existing models/theories, and develop new ones, if necessary, to better understand the role of communication in this overlooked population. The present study examined people's communication by focusing on the factors influencing health disclosure decision-making and patterns of disclosure. Greater knowledge of the role of communication in health outcomes for people in committed relationships (e.g., married/partnered) is necessary, however, and may provide information for better self-management of chronic health conditions for those without the benefit of a committed relationship (e.g., elderly, divorced, widowed).

*Implications for theorizing about disclosure, relationships, and uncertainty.* In synthesizing the areas of research explored in this study, namely disclosure (e.g., Greene, 2009; Afifi & Weiner, 2009), uncertainty (e.g., Babrow, 2007; Berger & Calabrese, 1975; Brashers, 2007; Mishel, 1988, 1990), and relationships (e.g., Knobloch & Solomon, 2004) one question that surfaces is “do we really need all of these theories/models?” The diverse theories and models allow researchers to look at interpersonal communication processes from a variety of angles, they guide investigations, and help researchers make sense of and interpret research findings (Braithwaite & Baxter, 2008).

Similarities among the three areas previously mentioned are: (1) that uncertainty is either a key feature or an underlying feature in each area; and (2) that uncertainty influences how people process (e.g., appraisals of uncertainty, health information), plan

(e.g., disclosure/nondisclosure, seek/avoid), and produce (e.g., patterns of disclosure, directness, explicitness of communication) messages. Differences among the models/theories are evident in the approaches researchers take for examining the phenomena. Disclosure decision-making models such as the RRM and the DD-MM explicate the factors proposed to influence disclosure decisions and pave the way for empirical testing and moving theory forward. Recent studies provide first tests of the DD-MM (e.g., Greene et al., 2009, 2010) and others have expanded portions of the DD-MM framework (e.g., Magsamen-Conrad et al., 2010; Choi et al., 2010). Moreover, the present study of disclosure decision-making in the context of a heart-related condition provides empirical evidence supporting the factors explicated in the DD-MM, and thus imply that the key components may apply across situations and contexts. Similarly, the relational turbulence model (Solomon & Knobloch, 2004) identifies mechanisms inherent to relationship development (e.g., relational uncertainty) that make people more reactive to relationship circumstances. On the other hand, theories such as UMT and CPM provide frameworks for examining uncertainty and privacy regulation, respectively, and have made significant contributions to interpersonal communication research and theory. Taken together, the theories reviewed in the present study provide a roadmap for continued exploration, empirical testing, and theory building.

### *Practical Implications*

Understanding the sources of illness uncertainty and how uncertainty influences patients' ongoing disclosure can help health care providers plan for more effective information giving, sharing, and estimate patients' information needs. Ong et al. (1995) defined a good physician-patient relationship as one in which mutual trust exists and

patients are allowed to express their reasons for the visit such as symptoms, thoughts, feelings, and expectations. Further, Ong et al. argued that effective exchange of information consisting of information giving and information seeking is necessary for the physician to make the correct diagnosis. Results of the current study indicate that uncertainty influences people's ability to communicate to their partner about their health condition. It follows that patients who lack communication efficacy may be less likely to talk about important information with their health care providers (e.g., physicians, nurses, home health care personnel). On the other hand, patients who have established a relationship with their health care provider/s should perceive the ability to engage in open honest communication about the status of their health. Thus, future research should test if the patterns of ongoing disclosure with healthcare providers are similar to partners.

The findings of this study also have practical implications for couples' support groups. Clinicians are increasingly identifying patient uncertainty as an important part of the illness experience and providing suggestions for health care providers on how to help patients manage uncertainty (see Mishel & Clayton, 2003). In the current study, people experiencing uncertainty about their prognosis with a chronic heart-related condition were more likely to talk about a range of topics related to their condition. Uncertainty about symptom visibility, on the other hand, predicted that patients talked less frequently about their heart condition. Clearly, health care providers, support group personnel, and cardiac rehabilitation program designers should explore people's illness uncertainties and identify salient factors influencing their ability to communicate about some topics related to their heart condition, but avoid talk about others.

The goal of cardiac rehabilitation programs, for example, is “to stabilize, slow or even reverse the progression of cardiovascular disease, thereby reducing the risk of heart disease, another cardiac event or death” (Americanheart.org). Such programs typically focus on counseling patients on understanding and managing the disease process, counseling on nutrition, helping patients modify risk factors (e.g., high blood pressure, smoking, physical inactivity, obesity and diabetes), helping patients begin an exercise program, providing vocational guidance to enable the patient to return to work, supplying information on physical limitations, counseling on appropriate use of prescribed medications, and lending emotional support (Americanheart.org). The focus of cardiac rehabilitation programs is necessarily on improving patients’ chances for long-term health outcomes. Yet, significant others (e.g., partners, sons/daughters, and close friends) are also involved in patients’ successful rehabilitation after a cardiac event (Rantanen, Kaunonen, Astedt-Kurki, & Tarkka, 2002). Thus, helping patients and significant others improve their ability to communicate about a heart-related condition should be a part of any cardiac rehabilitation program. Having patients role-play discussions about sensitive topics (e.g., health prognosis) with a partner may be one way to improve people’s perceptions of their ability to talk about difficult issues. As Goldsmith suggested, “communication can be both a source of uncertainty and a resource for managing uncertainty” (2009, p. 27).

### *Limitations*

As with any research study, there are limitations that must be considered. The following sections will address limitations related to sampling, procedure, design, and analyses.

### *Sampling*

There are a number of sampling limitations which must be addressed. First, these data were collected in one state in the northeastern United States, and it is not known if the results would generalize to other areas or countries. Similarly, the data were collected in a suburban community from one cardiology office, and therefore, the results may not generalize to either inner city or rural populations.<sup>10</sup> Second, these data underrepresent minority group members. The predominantly white sample in the current study limits generalization to other ethnic groups. Although heart disease is the leading cause of death for people of most ethnicities in the United States, including African Americans, American Indians/Alaska Natives, Hispanics, and whites, the percentage of deaths from heart disease (27%) is highest for whites (CDC.gov). Moreover, despite the predominantly white sample, use of actual patients with a diagnosed heart-related condition expands research on disclosure decision-making beyond that of college students and their close friends and family members. A final sample limitation is that participants in this study reported relatively long-term, high quality relationships, limiting generalizability to other less satisfied and shorter-term relationships. Thus, future research should attempt to increase sample diversity in a variety of ways.

### *Procedure*

The procedure for the study involved patients completing the anonymous survey in the waiting room of a busy cardiology practice. While most patients had enough time to complete the survey while waiting for their scheduled appointment, other patients were still filling out the survey when they called for their appointment. Those patients were instructed that they could complete the survey in the examination room and return the

completed survey to the researcher prior to leaving the office. A limitation is that the researchers had less control and were not able to observe if the patient solicited help from others in filling out the survey. A better design would establish that patients had enough time to complete the survey in the waiting room either prior to, or after, their scheduled appointment, but physician waiting times varied. Additionally, the significant number of elderly patients in the sample population created challenges, such as a patient's partner/companion assisting him/her in filling out the survey. Although the researchers requested that participants fill out the survey independently and invited those accompanying the patient to fill out companion surveys, several surveys were discarded after it became obvious that patients were not filling the survey out alone. A better design would separate participants and nonparticipants, but this was not possible given the nature of the data collection site (i.e., a private medical office).

### *Design*

The findings of this study are based on self-report data. As such, they are open to distortions and misrepresentations such as over- or under- reported responses and social desirability. Although there are drawbacks to self-report data, a recent report suggested that information from patients about a health condition and condition management can enhance the understanding of patients' experiences and responses to therapy and inform clinical practice (Lohr & Zebrack, 2009). Moreover, disclosure decision-making is about people's perceptions, and self-reports continue to be a useful way to measure people's perceptions, thoughts, feelings, expectations, and memories (see Harvey, Hendrick, & Tucker, 1988). The use of individual data to examine dyadic relationship processes and make relationship conclusions (Caughlin & Golish, 2002; Greene, 2009) is also a

limitation in this study. Although there are challenges, future research should explore ways to recruit couples where one partner is managing a chronic health condition. The present study collected limited partner data and focuses on the patient's perspective. Future research should consider outcomes of illness uncertainty beyond depth, breadth, and frequency of disclosure. Although exploring people's patterns of disclosing to a partner about a heart condition (i.e., depth, breadth, and frequency) expands research on health disclosure decision-making beyond initial disclosure or disclosure intentions, more needs to be done to better understand the dynamic process of disclosure for people in relationships who are managing chronic health conditions. Such research could look at how patterns of disclosure affect relationships, people's management of uncertainty, and the process of health decision-making. Due to the cross-sectional nature of the data, it is important to note the inability to clearly establish the causal direction between the variables. Longitudinal and/or diary data would be helpful to better capture the notion of disclosure as a dynamic process in which prior partner responses to information influence a person's subsequent disclosures about a health condition.

Another shortcoming of the current study's design was the manner in which symptom uncertainty was conceptualized and measured. Uncertainty about visibility of symptoms has limitations. There are other ways to measure symptom uncertainty that may influence ongoing disclosure decision-making such as uncertainty about side effects (e.g., impotence) of some medications (e.g., antihypertensives). Further, use of similar measures for self-focused, other-focused, and relationship-focused uncertainty regarding prognosis and symptoms could have sensitized participants to the measures. A better design would have varied the order of the measures. Finally, the principle of

compatibility (Ajzen & Fishbein, 1977; Fishbein & Ajzen, 1975; see also Ajzen, 2005; Hale, Householder, & Greene, 2002) states that indicators of a given disposition are said to be compatible with each other to the extent that their target, action, context, and time elements are assessed at identical levels of generality and specificity. Fishbein and Ajzen further argued that predictive power is heightened when predictor and behavior variables matched in regard to target, action, context, and time leading to significantly stronger relationships between variables. The measures employed in this study, however, may not have been specific enough in terms of context and time which may have led to bias in estimates of relationships between variables in the model.

### *Analyses*

When using SEM, it is recommended that observed variables have four or more items (e.g., in a survey instrument) although three is acceptable and common practice. A limitation of using fewer than three or four items per latent variable is increased measurement error. However, two indicators or even a single indicator may be acceptable if the researcher is confident in the measure's validity and reliability (Garson, 2009). Reliability for the self-, partner-, and relationship-focused symptom uncertainty items was low and a decision was made to use two items for each latent variable. Second order factor analyses indicated a good fitting model. Future research should be attentive to having multiple items for each observed variable. Finally, because there cannot be missing data in SEM analyses, there was a loss of 50 patients in those analyses.

### *Future Research*

Patients in this study reported on their patterns of disclosure to a partner, which may reflect a social desirability bias. A dyadic patient-partner data set is needed to more



accurately reflect the communicative behaviors of partners. Additionally, participants' reports of the depth, breadth, and frequency of their disclosure to a partner about a heart-related condition constitute only one way of examining the dynamic nature of disclosure. There are other ways to explore the disclosure decision-making process beyond initial disclosure, and this study represents one attempt to move the field forward in better clarifying that process. The next section describes an untested potential future model (see Figure 9).

#### *Untested Potential Patterns of Disclosure Decision-Making Model*

The proposed model offers a conceptualization of potential factors occurring after the depth, breadth, and frequency of the health disclosure decision-making model (revised DD-MM). In the potential model (see Figure 9), individuals assess health information in several ways such as in terms of the five DD-MM (Greene et al., 2010) components (i.e., stigma, preparation, prognosis, relevance to others, and symptoms), valence (positivity/negativity), uncertainty (e.g., prognosis, symptoms), and/or in terms of the private /secret nature of the information.

Other key DD-MM factors in the potential model include assessing a receiver in terms of relational quality and anticipated reaction such as the present study's perceived partner support. Anticipated reactions have also been conceptualized as relational consequences and confidence in a receiver's response (e.g., see Greene et al., 2010; Magsamen-Conrad et al., 2010). A final key factor in the potential model (based on the DD-MM and the present study) is efficacy which is expanded to include measures of not only *communication* efficacy (to partner), but *coping* and *target* efficacy (e.g., Afifi & Weiner, 2004). Afifi and Weiner posit that information-seekers enact *coping efficacy* to

assess whether they can cope with expected outcomes such as a receiver becoming overly anxious about one's health condition. *Target efficacy* helps individuals assess whether the target has the ability and honesty to provide the needed information. A person may avoid disclosing health information to another person such as a partner if that person has his/her own health issues (e.g., dementia) or other preoccupations (e.g., job, family stress). Efficacy, in turn, predicts patterns of disclosure in terms of depth, breadth, and frequency (as conceptualized in the present study).

What is new about the proposed model are measures of planning/scheduling of disclosure (e.g., upon receiving test results or waiting for an opportune moment), the effects (on self, other, and relationship) of disclosing in-depth and frequently about a range of topics, and a person's response/reaction to disclosure depth, breadth, and frequency. The model is recursive and indicates feedback loops suggesting that a person's response is likely to influence efficacy, perceived support (and other anticipated reaction/response variables), and relational quality. Similarly, the model proposes a feedback loop from effect of disclosure to information assessment, as well as to efficacy, perceived support, and relational quality. The feedback loops, however, will work differently depending on the disclosure target (e.g., spouse/partner, other family member, and close friend). For example, longitudinally individuals will reassess their health information (e.g., as new or fluctuating information develops), the status of their relationship with the recipient (e.g., decreasing relational quality), anticipated reaction, and efficacy which will then influence subsequent disclosure decisions (e.g., depth, breadth, frequency, planning, scheduling) , perceptions of other's response (e.g., provided additional/expected support) , and effect of disclosure on the self, other, and the

relationship. The process is then repeated as often as necessary throughout the trajectory of a particular health condition.

To summarize, the potential model incorporates recent research utilizing the DD-MM as a framework and proposes an expansion of the model to better understand disclosure decision-making beyond initial disclosure. Such research identifies factors influencing intentions to disclose health information (e.g., Greene et al., 2010), planning and scheduling of disclosure (Choi et al., 2010), effects of disclosure on relationships (Magsamen-Conrad et al., 2010), as well as the present study's exploration of uncertainty and patterns of disclosure. Continued research and model testing will allow for building and refining theory in the context of disclosure decision-making. For example, although the research cited previously focuses on the nature of information that people disclose (or not), less is known about the kinds of information people avoid disclosing to a partner, especially in the context of a chronic health condition such as heart disease.

### *Topic Avoidance*

Although the present study explored patterns of disclosure in terms of depth, breadth, and frequency, we know less about the topics that people with chronic heart-related conditions avoid sharing with a partner (see Goldsmith et al., 2007 on communicating about cancer). People in long-term relationships may report that they are able to disclose in-depth about numerous topics as often as is necessary. Yet, in reality, they are likely to avoid certain discussions (e.g., sexual difficulties, death). A better understanding of the function of topic avoidance in the management of chronic health conditions is warranted. It may be, for example, that people in otherwise satisfactory relationships share certain information with individuals other than a partner such as a

close friend, child, or sibling. Is it healthier for people to have other close friends and/or family members in whom to confide? Moreover, for people in long-term relationships what is the effect on the surviving partner's disclosure patterns when the other partner dies? For those who do not have a life partner, it would be important to investigate other social network members (e.g., sibling, parent, or close friend) with whom individuals talk about their health issues.

### *Disclosure and Health Indicators*

Studies exploring the relationship between patients' reported communication about their health condition and indicators of heart health such as serum cholesterol and triglyceride levels, blood pressure, and exercise tolerance levels could contribute to the literature on health benefits of disclosure. For example, Lepore, Allen and Evans (1993) investigated whether social support can reduce cardiovascular reactivity to an acute stressor. In their study, college students gave a speech in one of three social conditions: alone, in the presence of a supportive confederate, or in the presence of a nonsupportive confederate. Systolic and diastolic blood pressure was measured at rest, before the speech, and during the speech. While anticipating and delivering their speech, supported and alone participants exhibited significantly smaller increases in systolic and diastolic blood pressures than did nonsupported participants. Supported participants also exhibited significantly smaller increases in systolic blood pressure than did alone participants before and during the speech. Further, men had higher stress-related increases in blood pressures than did women, but gender did not moderate the effects of social support on cardiovascular reactivity. The results provide experimental evidence of potential health benefits of social support during acute stressors. Thus, comparing people's reports of

disclosure patterns and indicators of their heart health (e.g., blood pressure, serum cholesterol) may provide new insight on the relationship between disclosure and health.

### *Third Party Disclosure*

Finally, although not measured in this study, the DD-MM (Greene, 2009) accounts for *third party disclosure* (i.e., when people share others' information).

Research could investigate third party disclosures (e.g., gossip) in families when one family member is battling a chronic illness. For example, how do families keep each other updated? What factors influence ongoing disclosure to one family member and not another? Do family members differ in their perceptions of the personal, private, or secret nature of the afflicted member's health information? Such studies may provide fruitful avenues for continued research in this realm.

### Conclusions

The present study contributes to literature on disclosure decision-making by exploring people's general patterns of disclosing health information to a partner in the context of a chronic heart-related condition. Additionally, results of the study expand the dimensions of uncertainty as depicted in the DD-MM (Greene, 2009) by examining the role of prognosis and symptom uncertainty and relational quality on key components of disclosure decision-making (e.g., anticipated reaction, efficacy, disclosure). Overall, results suggest that although patients may experience prognosis and symptom uncertainty related to a heart condition, being in a long-term supportive relationship affords them the ability to disclose in-depth, about a range of topics, and frequently, if they so desire. Because even people who are satisfied with their relationships engage in topic avoidance, future research should examine the kinds of topics that people avoid sharing with a

partner in relation to a chronic illness such as a heart-related condition. Such research may contribute to our understanding of not only health disclosure decision-making but also the role of communication in people's management of such health conditions.

## Notes

<sup>1</sup> Hereafter the inclusive term “partner” will refer to both spouses and partners in committed romantic relationships.

<sup>2</sup> Viewed as a terminal disease just a decade ago, HIV/AIDS is now often characterized as a chronic yet manageable disease (Hoy-Ellis & Fredriksen-Goldsen, 2007); this conceptualization is a contested one in health promotion and prevention arenas.

<sup>3</sup> Kelly and McKillop (1996) provided a model for when to reveal personal secrets to a relationship partner. Kelly (2002) provides the specific relationship context of the secret information and is therefore a more “precise and comprehensive analysis” of when to reveal secrets (p. 192).

<sup>4</sup> Kelly and colleagues (see Kelly & Macready, 2009) disputed Pennebaker and Chew’s (1985; see also Neiderhoffer & Pennebaker, 2002) inhibition model which argued that writing about traumatic events has health benefits because it removes the stress associated with concealing the traumatic event. Kelly and colleagues counter that no empirical studies have shown that concealing information is detrimental to one’s health.

<sup>5</sup> Rodriguez and Ryave (1992) found that revealing secrets follows a discreetly organized interaction pattern that includes: 1) announcing the secret; 2) a recipient’s acceptance/rejection of the secret/contract/obligation; 3) telling the secret; and 4) recipient’s response to the secret (see also Sacks, 1970a).

<sup>6</sup> People’s assessment of risks predicts their readiness or willingness to reveal the secret. Similarly, prior disclosure literature revealed that individuals’ reasons for disclosing personal information reflect a self-focus, other-focus, and relationship-focus (Derlega & Winstead, 2001; Derlega et al., 2000; Derlega et al., 2004; Greene et al., 2006).

<sup>7</sup> The theory of planned behavior (TPB; Ajzen, 1985) hypothesizes a direct effect of perceived behavioral control (e.g., efficacy) on behavior (see Hale, Householder, & Greene, 2002).

<sup>8</sup> Bivariate correlations revealed that the three scales were positively correlated at the zero-order level (see Table 1). These correlations ranged from .46 to .72, all  $p < .01$ . Accordingly, a next step was examining the factor structure of the scales at the second-order level. A second-order CFA was constructed by assigning the 12 items to their scales, and in turn, assigning the three scales to a single second-order factor. Findings indicated that the scales were unidimensional at the second-order level,  $\chi^2(49) = 125.39$ ,  $p < .01$ ;  $\chi^2/df = 2.56$ ,  $CFI = .94$ ,  $RMSEA = .09$  (see Figure 5). The reliability of a composite index of the 12 items was satisfactory ( $M = 3.53$ ,  $SD = .73$ ,  $\alpha = .89$ ). The hypothesized model (Figure 2) was tested with *patterns of disclosure* as a second-order latent variable, however, a good model fit was not achieved,  $\chi^2(53) = 201.56$ ,  $p < .001$ ;  $\chi^2/df = 3.80$ ,  $CFI = .84$ ,  $RMSEA = .12$ . Alternately, 13 items measuring depth (five items), breadth (six items), and frequency (two items) formed a unidimensional measure of *patterns of disclosure*. CFA results indicated a good fit,  $\chi^2(62) = 179.18$ ,  $p < .001$ ;  $\chi^2/df = 2.89$ ,  $CFI = .91$ ,  $RMSEA = .09$ . Scores were summed and averaged to form a composite variable with higher scores indicating more depth, breadth, and frequency of disclosure patterns ( $M = 3.58$ ,  $SD = .67$ , range 1.46 to 5.0;  $\alpha = .87$ ). Again, the hypothesized model (Figure 2) was tested with *patterns of disclosure* as one latent variable, however, a good model fit was not achieved,  $\chi^2(34) = 127.33$ ,  $p < .001$ ;  $\chi^2/df = 3.74$ ,  $CFI = .86$ ,  $RMSEA = .12$ .

<sup>9</sup> A partner's unresponsive reaction is one reason why individuals engage in topic avoidance (Afifi & Guerrero, 2000; Guerrero & Afifi, 1995a, 1995b). Other reasons may include protection for the self, other, and relationship (Afifi & Schrodt, 2003), and to prevent conflict (Golish & Caughlin, 2002; Roloff & Ifert, 2000).

<sup>10</sup> The town of Long Branch, NJ is one of the largest cities on the New Jersey Shore. Population in 2008 was 32,622. Median household income is \$49,755, (New Jersey's median income is \$70,378) (city-data.com). Of the patients visiting the cardiology practice, approximately 50% have managed care or private insurance, 45% have Medicare, 3% are self-pay, and 2% have Medicaid (J. Checton, M.D., F.A.C.C., personal communication, February 21, 2010).



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## Appendix A

### *Automated Telephone Script*

Monmouth Cardiology Associates, L.L.C reminds patients (via automated telephone message) about their scheduled appointment forty-eight hours prior to the actual appointment. The following message was added to the telephone script to inform patients about an opportunity to participate in a research study on the day of their scheduled visit:

“Our office is collaborating with Rutgers University in a research study titled “Sharing information about heart-related conditions in relationships.” Researchers will be at our office on the day of your appointment asking patients to fill out an anonymous survey that takes approximately 15 minutes to complete. If you think you would like to participate, you are welcome to arrive 15 minutes prior to your scheduled appointment in order to complete the survey, or fill it out while you are waiting for your appointment.”

Thank you.

## Appendix B

Upon arrival for their scheduled appointment, patients provided their name to a receptionist and initialed a sign-in sheet. The receptionist then provided patients (if they desired) with a flyer indicating that a research study was being conducted that day.

### Research Opportunity

We are collaborating with researchers from Rutgers University who are at our office today asking patients to fill out a short, anonymous survey titled “Sharing information about heart-related conditions in relationships.” As a token of their appreciation for completing the 10-12 minute survey, you will have the opportunity to enter your name into a drawing for one of three \$50 American Express gift certificates. If you think you would like to participate or would like to know more about the study, please feel free to talk with the researchers. They are wearing name tags and have a table set up in the waiting room.

Thank you,

## Appendix C

### *Consent to Be a Research Participant*

Principal Investigator: Dr. Kathryn Greene  
 Institution: Department of Communication, SCILS, Rutgers University  
 Address: 4 Huntington Street, SCILS Building, New Brunswick, NJ 08901 - 1071  
 Phone: (732) 932-7500 ext. 8115 Email: [kgreene@scils.rutgers.edu](mailto:kgreene@scils.rutgers.edu)

**Purpose:** You have been asked to participate in a research project titled “Sharing information about heart-related conditions in relationships” conducted by faculty and students in communication. The purpose of this study is to investigate people’s communication with others regarding a health condition.

**What Will Happen:** During this project, you will be asked to fill out a survey which will ask you demographic questions (such as your age) and questions about decisions you make when sharing information about your health condition. You will be asked questions about the health condition itself and questions about your relationship with a person with whom you share the information. The entire questionnaire will take about 15 minutes to complete.

**Anonymity:** Please do NOT write your name on the survey. Information gathered from the survey will be anonymous and will be used only for the purpose of this project. That is, we cannot match your responses to your name.

**Risk:** You will be asked to reflect on a physical health condition and your decisions to share, or not share, the information with others. If the survey brings up issues that create psychological distress of any sort, you may contact us for a list of referrals for counseling.

**Benefit:** Your participation and completion of this project will help us understand the decisions people make about sharing health information. The results will add to our knowledge on sharing personal health information in interpersonal relationships. You will have the opportunity to obtain results of the study when they become available. Upon completion of the survey your name will be entered (if you choose) into a raffle for 3 \$50 American Express gift certificates. Your name will not be linked to your survey.

**Alternative Procedures:** There is no alternative procedure in this research project.

**Further Information:** If you have other questions concerning this project, please feel free to contact the Principal Investigator (Dr. Kathryn Greene) via above contact information, or contact the IRB via following three means:

Rutgers University Institutional Review Board for the Protection of Human Subjects  
 Office of Research and Sponsored Programs  
 3 Rutgers Plaza, New Brunswick, NJ 08901-8559  
 Tel: 732-932-0150 ext. 2104 Email: [humansubjects@orsp.rutgers.edu](mailto:humansubjects@orsp.rutgers.edu)

**Note:** Your participation in this research is **VOLUNTARY**. Refusal to participate or withdrawal during the research will involve NO penalty. If you are younger than 18 or pregnant, you cannot participate in this study.

Thank you again for your participation.

Principal Investigator _____	Date _____
Participant’s Name (Print) _____	_____
Participant’s Signature _____	Date _____

## Appendix D

*Instructions for Patients*

Rutgers University

Department of Communication

## Survey of Sharing about Heart-Related Conditions in Relationships

This questionnaire is designed to learn how you share information with another person about your heart-related diagnosis. Please answer questions frankly and honestly. People have different reasons for sharing and not sharing health information, and there are no "right" or "wrong" answers. Also, remember that your answers are completely anonymous.

*This survey requires approximately 15 minutes to complete*

Instructions

A. Please read each question carefully, and answer questions to the best of your knowledge. Take as much time as you need. Please answer each question in order.

B. Be sure to follow directions given for answering sets of questions. Answer each question--do not skip questions. If you want to make additional comments, feel free to write them in the margins.

C. When you have answered the questions in this booklet, read the attached sheet. When you are through, return this booklet to the investigator.

Here is an example of the kind of question you will be asked.

	Strongly				Strongly
	Disagree	Disagree	Neutral	Agree	Agree
A. I like pizza.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If I only sort of like pizza, then I would fill in the circle "Agree," like in the example above (A).

In the example below (B), the person really does not like pizza.

	Strongly				Strongly
	Disagree	Disagree	Neutral	Agree	Agree
B. I like pizza.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Please turn the page and begin answering the questions.**



## Appendix E

### *Debriefing Form*

Thank you for your time and effort in completing this survey. Your participation provides crucial information for us in understanding how people communicate information about their health condition with others. Because most people will face some type of health condition at some point in their lifetime, it is important to understand not only how people manage their illness, but how they manage sharing information regarding their health condition with others. After completing the survey, some participants may be interested in the project and would like to find more information about it (e.g., results and implications of this project). If you would like this information, we would be glad to provide a copy of the results when they become available in several months. Please provide your home or email address below and return this form to us.

We would like to thank you again for your participation. We greatly appreciate you time, effort, and assistance in this study.

(Optional: ONLY if you want to receive a summary of the results in a few months)

Home Address: \_\_\_\_\_ or Email address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Dr. Kathryn Greene, Principal Investigator  
 Department of Communication  
 Rutgers, the State University of New Jersey  
 4 Huntington Street  
 New Brunswick, NJ 08901  
 (732) 932-7500 ext. 8115  
 kgreene@scils.rutgers.edu

## Appendix F

*Measure of Self-Focused Prognosis Uncertainty*

These questions ask how certain are YOU about the following:

		Very Uncertain	Somewhat Uncertain	Neutral	Somewhat Certain	Very Certain
1.	My health will deteriorate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	I am concerned about my future with this health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	My health condition is chronic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	The prognosis for my health condition is good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix G

*Measure of Other-Focused Prognosis Uncertainty*

These questions ask how certain your SPOUSE is about the following:

		Very Uncertain	Somewhat Uncertain	Neutral	Somewhat Certain	Very Certain
1.	My spouse thinks that my health will deteriorate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	My spouse is concerned about my future with this health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	My spouse thinks that my health condition is chronic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	My spouse thinks the prognosis for my health condition is good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix H

*Measure of Relationship-Focused Prognosis Uncertainty*

These questions ask how certain you are about your RELATIONSHIP with your spouse and your health condition.

		Very Uncertain	Somewhat Uncertain	Neutral	Somewhat Certain	Very Certain
1.	My deteriorating health will affect our relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	My health condition is a concern for the future of our relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	The chronic nature of my health condition has affected our relationship.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	The prognosis of my health condition has <u>not</u> affected our relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix I

*Measure of Self-Focused Symptom Uncertainty*

These questions ask how certain are YOU about the following:

	Very Uncertain	Somewhat Uncertain	Neutral	Somewhat Certain	Very Certain
1. Symptoms of my health condition are easy to spot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. If I do not tell, no one notices my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I do not pay attention to symptoms of my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I understand what symptoms of my health condition mean	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix J

*Measure of Other-Focused Symptom Uncertainty*

These questions ask how certain your SPOUSE is about the following:

	Very Uncertain	Somewhat Uncertain	Neutral	Somewhat Certain	Very Certain
1. My spouse thinks that symptoms of my health condition are easy to spot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. If I do <u>not</u> tell, my spouse thinks that no one notices my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My spouse thinks that I do <u>not</u> pay attention to the symptoms of my health condition.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. My spouse thinks that I understand what symptoms of my health condition mean	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix K

*Measure of Relationship-Focused Symptom Uncertainty*

These questions ask how certain you are about your RELATIONSHIP with your spouse and your health condition.

	Very Uncertain	Somewhat Uncertain	Neutral	Somewhat Certain	Very Certain
1. Easy to spot symptoms of my health condition create challenges for our relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Others noticing the symptoms of my health condition have not affected our relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. <u>Not</u> noticing symptoms of my health condition affects our relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Understanding what symptoms of my health condition mean has been good for our relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix L

*Measure of Relational Quality*

Please answer these questions about your overall relationship with your spouse.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I enjoy spending time with my spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My relationship with my spouse is important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I am not close to my spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. My spouse's opinion is important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. This relationship is satisfying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I get everything I need out of this relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. My spouse does not understand my wants and needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I couldn't ask for more from my spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Appendix M

*Measure of Perceived Partner Support*

These questions ask how your spouse supports you with your health condition.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. My spouse supports me emotionally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My spouse is not the one I go to for support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My spouse helps me find information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I do not get much support from my spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My spouse offers to help me (goes with me to the doctor, to the store, helps around the house)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix N

*Measure of Communication Efficacy to Partner*

These questions ask about sharing information with your spouse.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I am confident that I can share information about my health condition with my spouse when I want to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I have difficulty sharing information about my health condition with my spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. If I want to, I can talk to my spouse about my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I do not know what to say when I try to share information with my spouse about my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix O

*Measure of Depth of Disclosure*

These questions ask about the depth of the topics you share with your spouse.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I have heart-to-heart talks with my spouse about my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I do not want to worry my spouse about little things related to my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My spouse and I only talk about superficial issues related to my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I hold back from sharing intimate issues about my health condition with my spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I share my innermost fears about my health condition with my spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix P

*Measure of Breadth of Disclosure*

These questions ask about the range of the topics you share with your spouse.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I discuss a wide variety of issues related to my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Communication about my health condition is limited to specific topics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. There are some issues related to my health condition that I do not talk about	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I talk about a lot of topics related to my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. There are some areas related to my health condition that I avoid discussing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I am hesitant to share small health concerns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix Q

*Measure of Frequency of Disclosure*

These questions ask how frequently you share information about your health condition with your spouse.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. We often talk about my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I rarely talk about my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My spouse and I have frequent conversations about my health condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How often do you talk with your spouse about your health condition?

	Never	1-2 times a month	1-2 times a week	1-2 times a day	Multiple times a day
1. How often do you talk with your spouse about your health condition?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Table 1

*Bivariate Zero Order Correlation Matrix for All Variables*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. SUProg	1.00											
2. OUProg	.66**	1.00										
3. RUProg	.43**	.35**	1.00									
4. SUSym	.17*	.18*	.22**	1.00								
5. OUSym	.13	.18*	.18*	.58**	1.00							
6. RUSym	.22**	.22**	.45**	.31**	.34**	1.00						
7. RelQual	-.02	-.21**	.26**	-.03	-.14	.06	1.00					
8. PerPartSupp	.18*	.01	.42**	-.02	-.13	.18*	.64**	1.00				
9. CommEff	.15*	.09	.46**	.14*	.02	.34**	.46**	.57**	1.00			
10. Depth	.15*	-.01	.26**	-.01	-.07	.26**	.46**	.49**	.54**	1.00		
11. Breadth	.17*	.08	.39**	.05	-.07	.27**	.42**	.43**	.56**	.72**	1.00	
12. Freq	-.10	-.20**	-.03	-.24**	-.35**	-.04	.31**	.33**	.26**	.46**	.48**	1.00

\*  $p \leq .05$ ; \*\*  $p \leq .01$ , two-tailed

*Note:* SUProg is self-focused prognosis uncertainty; OUProg is other-focused prognosis uncertainty; RUProg is relationship-focused prognosis uncertainty; SUSym is self-focused symptom uncertainty; OUSym is other-focused symptom uncertainty; RUSym is relationship-focused symptom uncertainty; RelQual is relational quality; PerPartSupp is perceived partner support; CommEff is communication efficacy to partner; Depth is depth of disclosure; Breadth is breadth of disclosure; Freq is frequency of disclosure.

Table 2.1

*Item Loadings for Self-Focused Prognosis Uncertainty*

Item	Item Loadings
Self-Focused Prognosis Uncertainty ( $N = 248$ ; $M = 2.98$ , $SD = .72$ , range 1.25-5.00)	
1. My health will deteriorate (R)	.74
2. I am concerned about my future with this health condition (R)	.32
3. My health condition is chronic (R)	.51
4. The prognosis for my health condition is good	.27

(R) item is reverse-coded

Table 2.2

*Item Loadings for Other-Focused Prognosis Uncertainty*

Item	Item Loadings
Other-Focused Prognosis Uncertainty ( $N = 245$ ; $M = 2.93$ , $SD = .76$ , range = 1.25-5.00)	
1. My spouse thinks that my health will deteriorate (R)	.69
2. My spouse is concerned about my future with this health condition (R)	.47
3. My spouse thinks that my health condition is chronic (R)	.65
4. My spouse thinks the prognosis for my health condition is good	.34

(R) item is reverse-coded



Table 2.3

*Item Loadings for Relationship-Focused Prognosis Uncertainty*

Item	Item Loadings
Relationship-Focused Prognosis Uncertainty ( $N = 243$ ; $M = 3.76$ , $SD = .90$ , range 1.00-5.00)	
1. My spouse thinks that my health will deteriorate (R)	.76
2. My spouse is concerned about my future with this health condition (R)	.72
3. My spouse thinks that my health condition is chronic (R)	.76
4. My spouse thinks the prognosis for my health condition is good	.20

(R) item is reverse-coded

Table 3.1

*Item Loadings for Self-Focused Symptom Uncertainty*

Item	Item Loadings
Self-Focused Symptom Uncertainty ( $N = 247$ ; $M = 3.53$ , $SD = .97$ , range 1.00-5.00)	
1. Symptoms of my health condition are easy to spot (R)	.73
2. If I do not tell, no one notices my health condition	.44

(R) item is reverse-coded

Table 3.2

*Item Loadings for Other-Focused Symptom Uncertainty*

Item	Item Loadings
Other-Focused Symptom Uncertainty ( $N = 235$ ; $M = 3.20$ , $SD = .95$ , range 1.00-5.00)	
1. . My spouse thinks that symptoms of my health condition are easy to spot (R)	.66
2. . If I do not tell, my spouse thinks that no one notices my health condition	.34

(R) item is reverse-coded

Table 3.3

*Item Loadings for Relationship-Focused Symptom Uncertainty*

Item	Item Loadings
Relationship-Focused Symptom Uncertainty ( $N = 235$ ; $M = 3.64$ , $SD = .92$ , range 1.00-5.00)	
1. Easy to spot symptoms of my health condition create challenges for our relationship (R)	.65
2. Others noticing the symptoms of my health condition have not affected our relationship	.20

(R) item is reverse-coded

Table 4

*Item Loadings for Relational Quality*

Item	Item Loadings
Relational Quality ( $N = 249$ ; $M = 4.35$ , $SD = .60$ , range 1.40-5.00)	
1. I enjoy spending time with my spouse	.74
2. I am not close to my spouse (R)	.56
3. My spouse's opinion is important to me	.73
4. This relationship is satisfying	.86
5. I couldn't ask for more from my spouse	.64
(R) item is reverse-coded	

Table 5

*Item Loadings for Perceived Partner Support*

Item	Item Loadings
Perceived Partner Support ( $N = 244$ ; $M = 4.25$ , $SD = .73$ , range 1.00-5.00)	
1. . My spouse supports me emotionally	.79
2. My spouse is not the one I go to for support (R)	.78
3. My spouse helps me find information	.81
4. I do not get much support from my spouse (R)	.52

(R) item is reverse-coded

Table 6

*Item Loadings for Communication Efficacy to Partner*

Item	Item Loadings
Communication Efficacy to Partner ( $N = 244$ ; $M = 4.47$ , $SD = .61$ , range 2.00-5.00)	
1. I am confident that I can share information about my health condition with my spouse if I want to	.88
2. I have difficulty sharing information about my health condition with my spouse (R)	.72
3. If I want to I can talk to my spouse about my health condition	.83
4. I do not know what to say when I try to share information with my spouse about my health condition (R)	.66

(R) item is reverse-coded

Table 7

*Item Loadings for Depth of Disclosure*

Item	Item Loadings
Depth of Disclosure ( $N = 248$ ; $M = 3.81$ , $SD = .83$ , range 1.75-5.00)	
1. I have heart-to-heart talks with my spouse about my health condition	.69
2. My spouse and I only talk about superficial issues related to my health condition (R)	.68
3. I hold back from sharing intimate issues about my health condition with my spouse (R)	.73
4. I share my innermost fears about my health condition with my spouse	.58

(R) item is reverse-coded



Table 8

*Item Loadings for Breadth of Disclosure*

Item	Item Loadings
Breadth of Disclosure ( $N = 248$ ; $M = 3.68$ , $SD = .93$ , range 1.00-5.00)	
1. I discuss a wide variety of issues related to my health condition	.89
2. There are some issues about my health condition that I do not talk about (R)	.80
3. There are some areas related to my health condition that I avoid discussing (R)	.88
4. I am hesitant to share small health concerns	.67

(R) item is reverse-coded

Table 9

*Item Loadings for Frequency of Disclosure*

Item	Item Loadings
Frequency of Disclosure ( $N = 244$ ; $M = 3.07$ , $SD = .88$ , range 1.00-5.00)	
1. . We often talk about my health condition	.95
2. I rarely talk about my health condition (R)	.72
3. My spouse and I have frequent conversations about my health condition	.79
4. How often do you talk with your spouse about your health condition?	.54

(R) item is reverse-coded

Figure 1. Health Disclosure Decision-Making Model

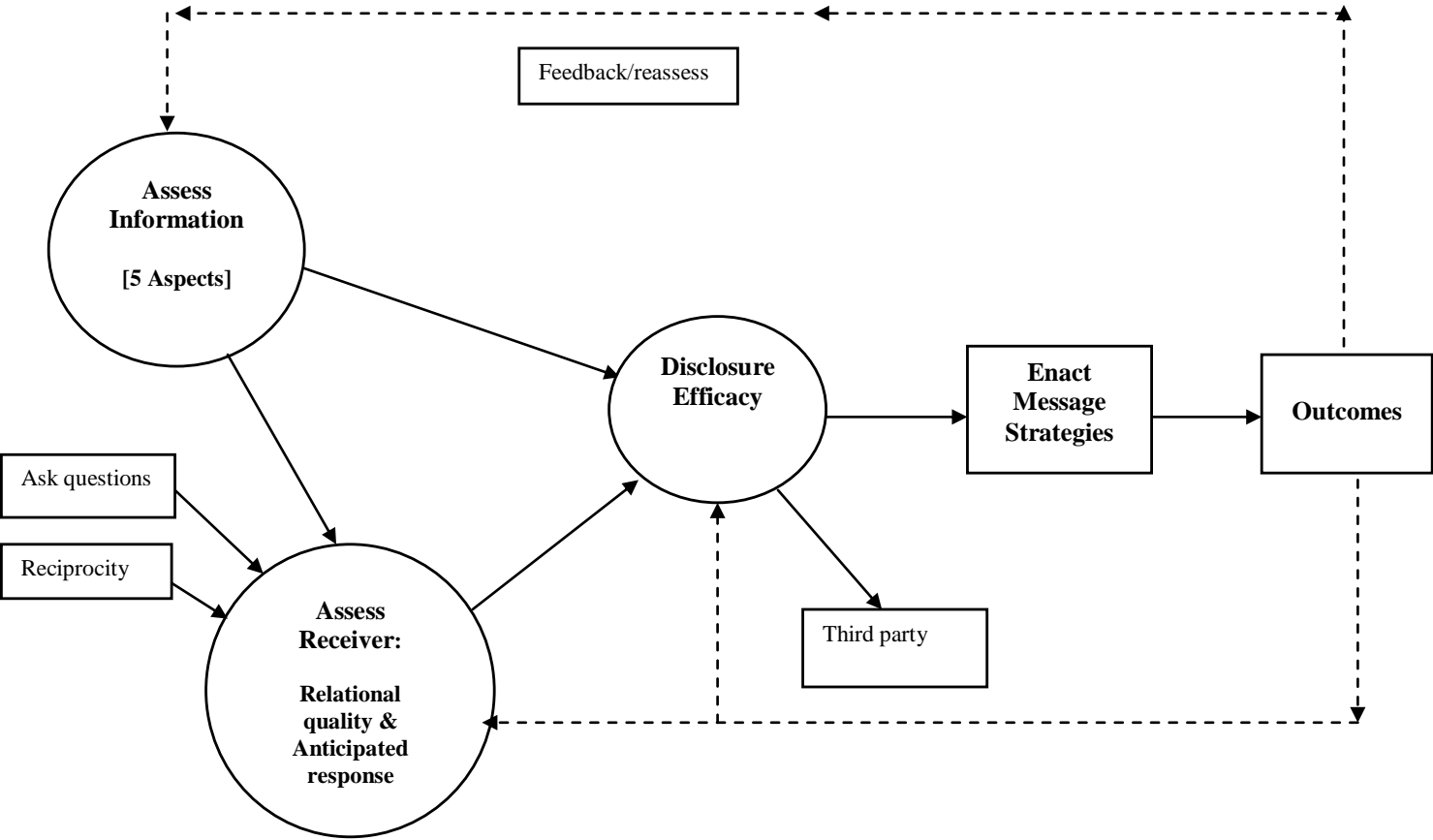


Figure 2. *Hypothesized Model*

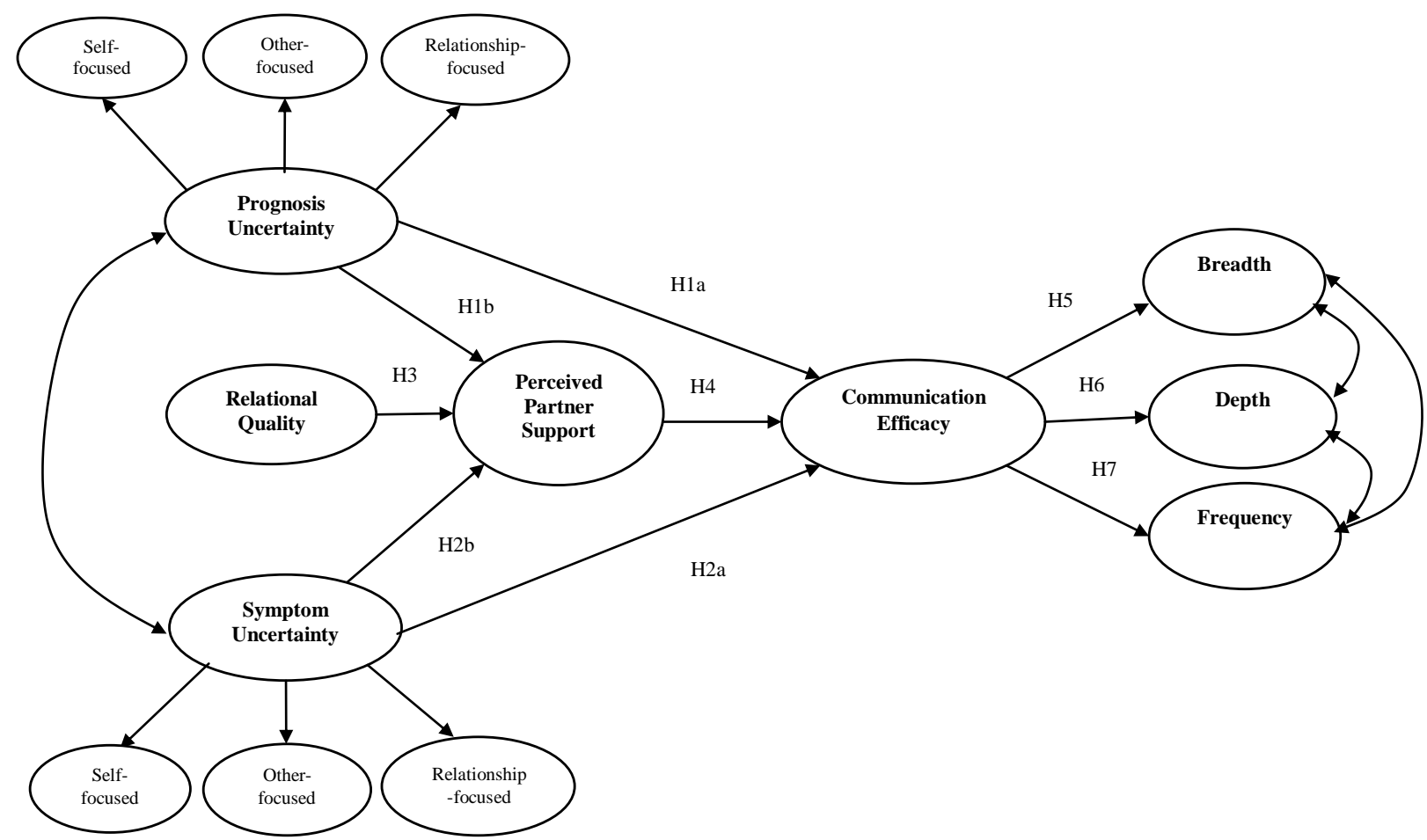
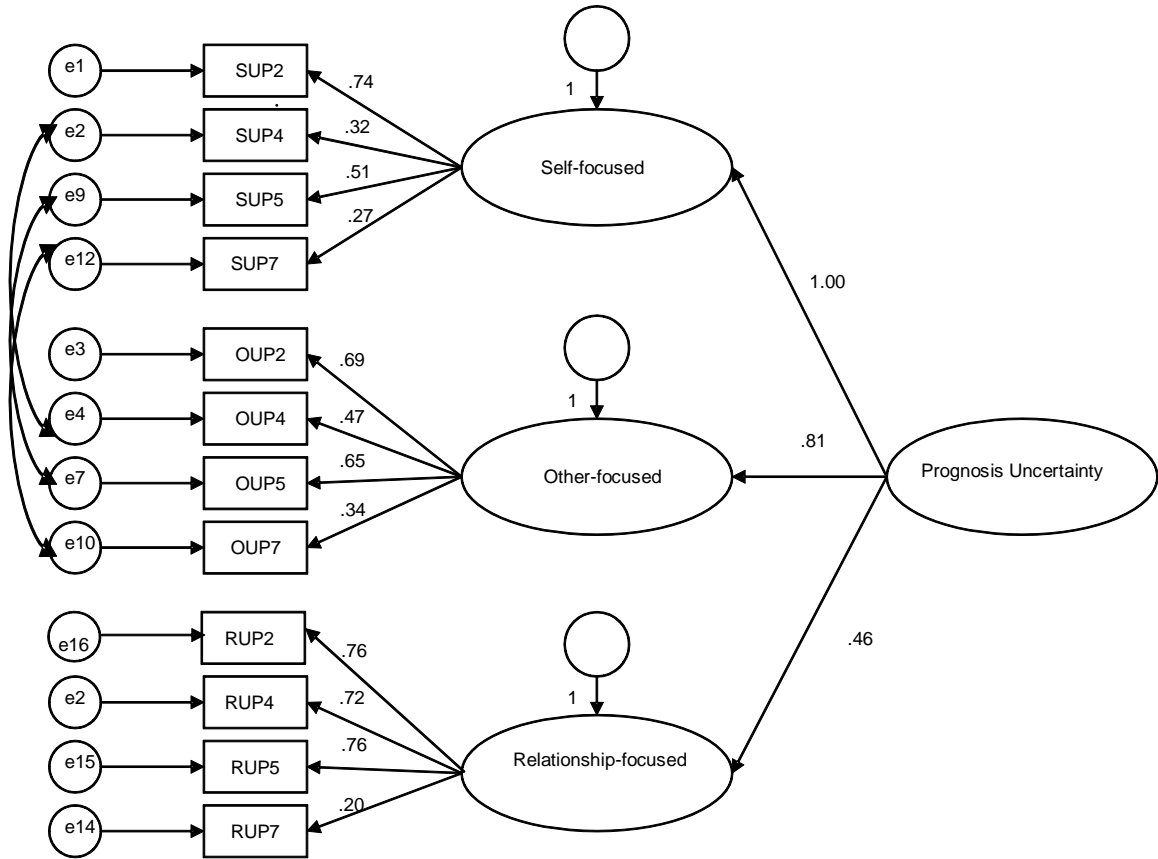
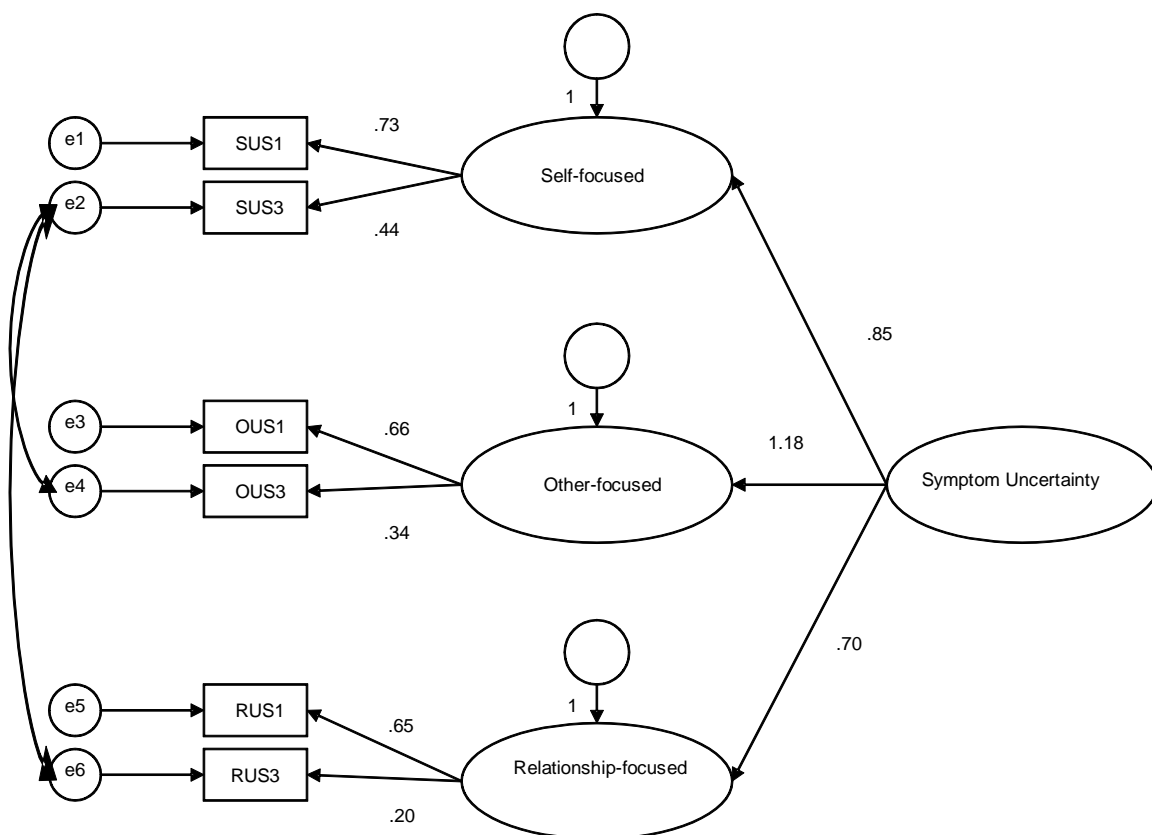


Figure 3. Second-Order Confirmatory Factor Analysis for Prognosis Uncertainty



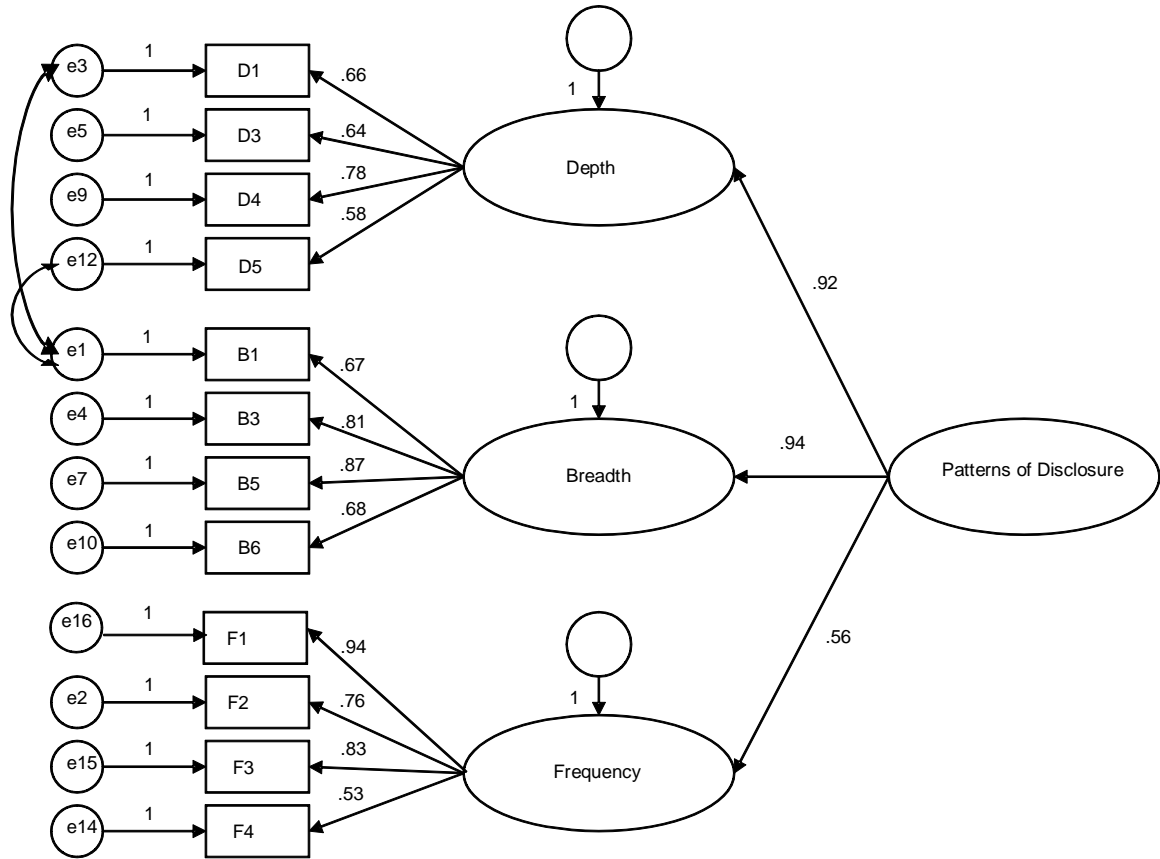
$$\chi^2(49) = 108.69, p < .01; \chi^2/df = 2.22, CFI = .90, RMSEA = .08$$

Figure 4. Second-Order Confirmatory Factor Analysis for Symptom Uncertainty



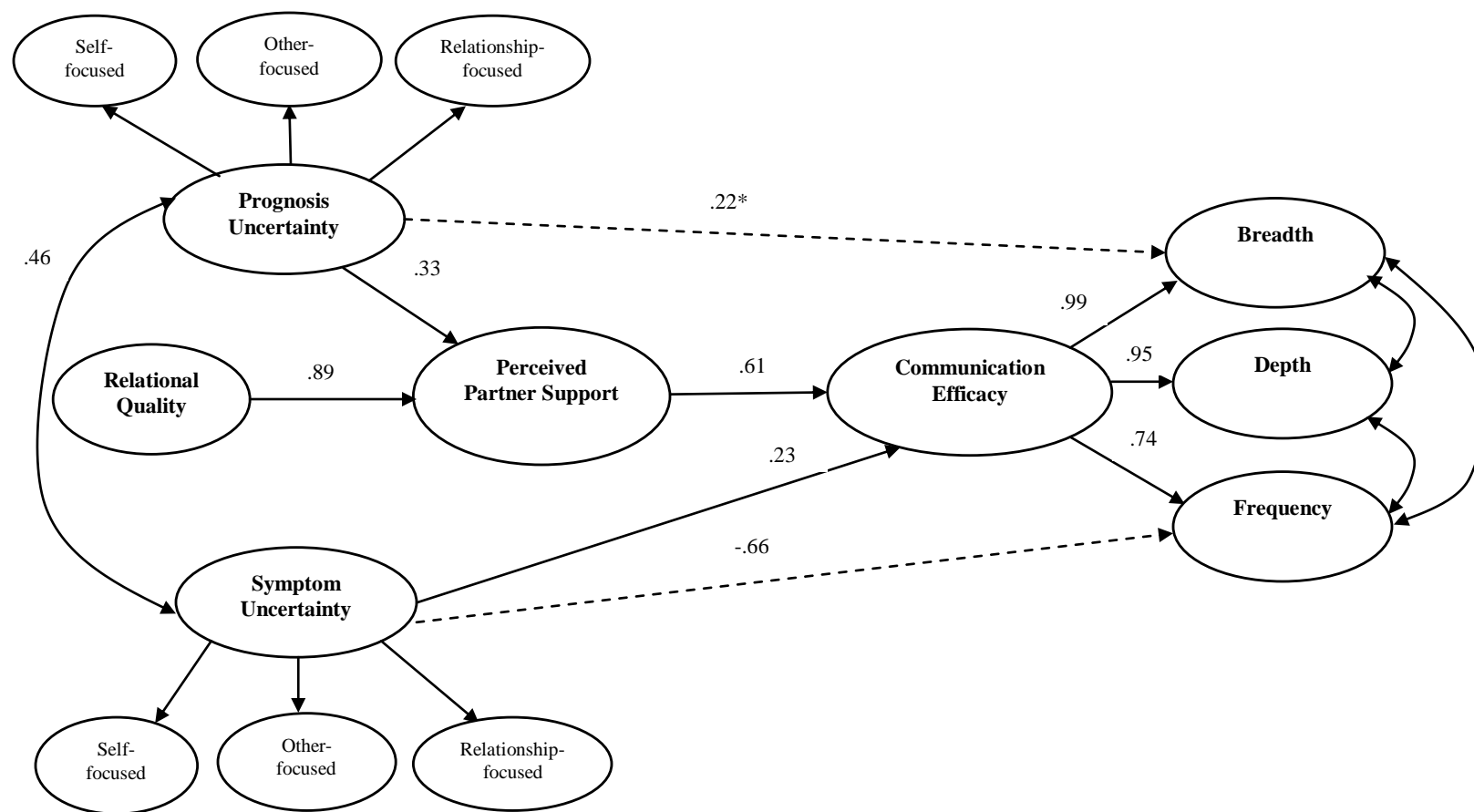
$$\chi^2(4) = 10.65, p < .05; \chi^2/df = 2.66, CFI = .96, RMSEA = .09$$

Figure 5. Second-Order Confirmatory Factor Analysis for Patterns of Disclosure



$$\chi^2(49) = 125.39, p < .01; \chi^2/df = 2.56, CFI = .94, RMSEA = .09$$

Figure 6. Results for Uncertainty Model and Patterns of Disclosure



—————> Significant hypothesized paths  
 - - - - -> Paths added based on the modification indices and RQ 1 and 2  
 \*Path significant  $p < .01$ . All other paths significant  $p < .001$



Figure 7. *Hypothesized Disclosure Model Based on Theory of Planned Behavior (Ajzen, 1985)*

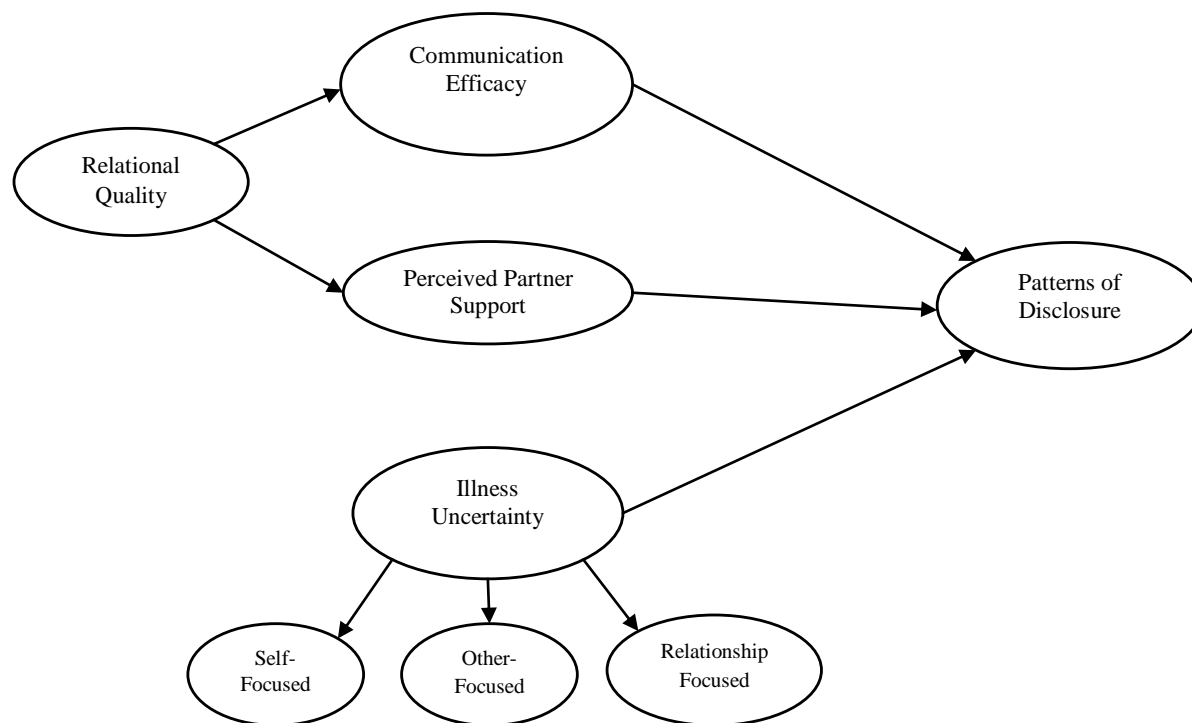
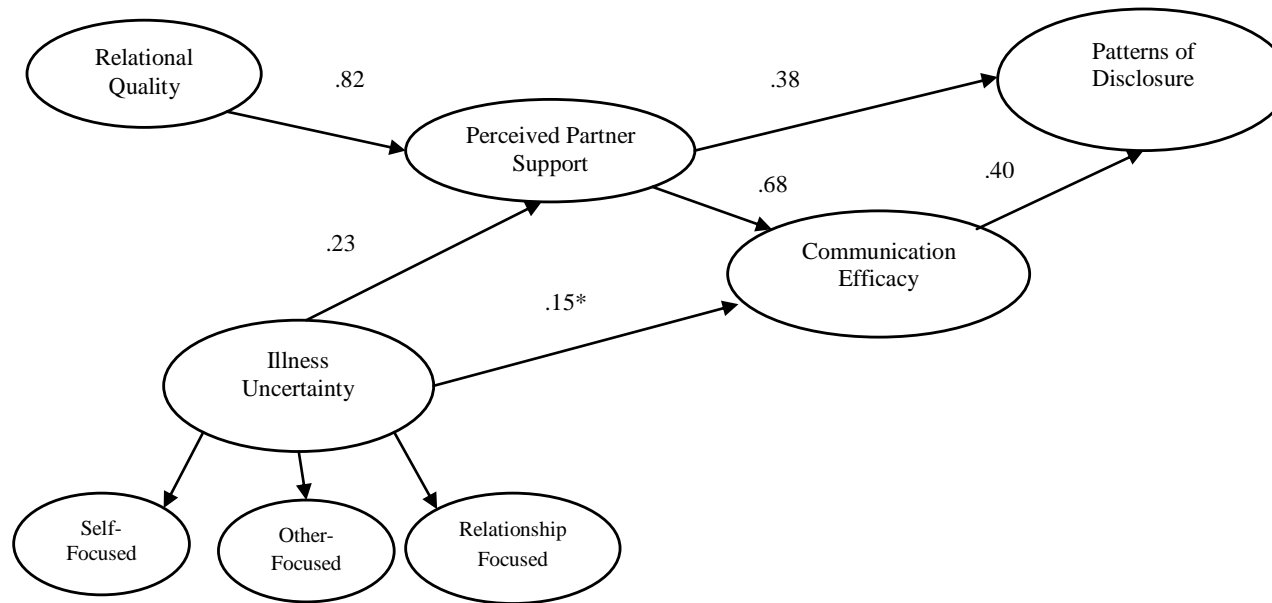


Figure 8. *Results for Disclosure Model Based on Theory of Planned Behavior (Ajzen, 1985)*



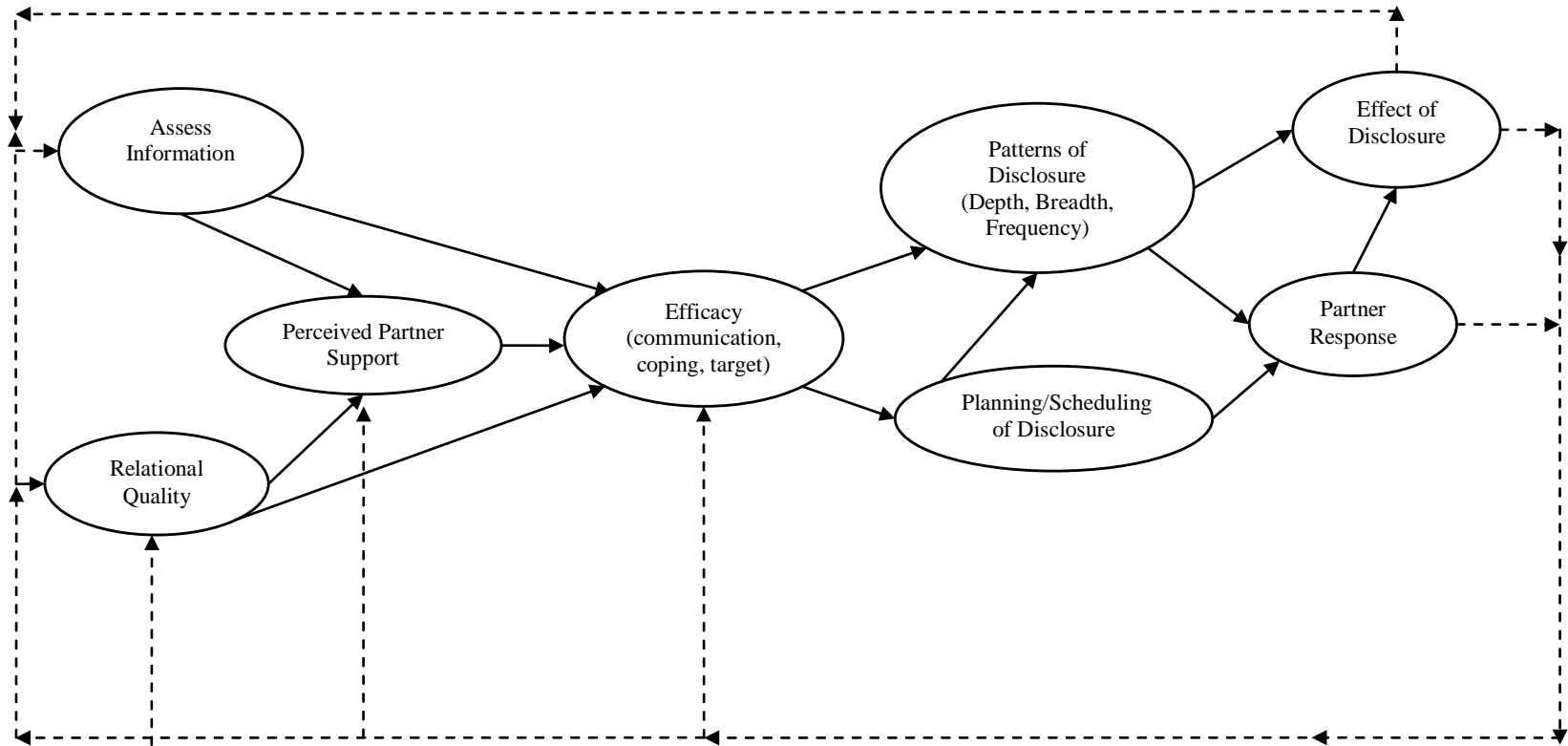
Chi sq/df = 6.91

CFI = .87

RMSEA = .17

\*Path significant  $p < .05$ . All other paths significant  $p < .001$

Figure 9. *Untested Potential Patterns of Disclosure Decision-Making Model Making*



## CURRICULUM VITAE

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**Education**

A.A.S.	1978	Marymount University Arlington, VA
B.A.	2001	Monmouth University West Long Branch, NJ
M.A.	2003	Monmouth University West Long Branch, NJ
Ph.D.	2010	School of Communication and Information Rutgers, The State University of New Jersey, New Brunswick, NJ

**Teaching Experience**

*Department of Communication, Monmouth University, 2003-Present*

- *Introduction to Communication*, Fall/Spring 2005, 2006, 2007, 2008, 2009, 2010
- *Interpersonal Communication*, Summer, 2007, 2008, Fall/Spring 2008, 2009
- *Critical Discourse*, Fall 2005; Fall/ Spring, 2006, 2007, 2008, 2009, 2010
- *Business and Professional Communication*, Fall 2009

**Publications**

Checton, M. G., & Greene, K. (in press). College students' use of compliance-gaining strategies to obtain prescription stimulants for illicit use. *Health Education Journal*.

Theiss, J. A., Knobloch, L. K., Checton, M. G., & Magsamen-Conrad, K. (2009). Relationship characteristics associated with the experience of hurt in romantic relationships: A test of the relational turbulence model. *Human Communication Research*, 35, 588-615.