Persuasion through facts and feelings: integrating affect and cognition into behavioral decision models and health messages

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Chapter one

Dissertation overview
Affect has long been neglected in models of behavioral decision making and the persuasive messages based on them. For example, health messages traditionally encourage health behaviors by listing positive consequences, and discourage risk behaviors by listing negative consequences, resulting in very rational messages. This approach to health communication is probably a reflection of influential theories, such as the theory of planned behavior (TPB; Ajzen, 1985; Ajzen, 1991), which emphasize that behavioral decisions are based on a rational process of weighing the pros and cons. In the past decade, this rational view of decision making has been challenged by a number of studies showing that individuals’ affect toward health behaviors has a great impact on health decisions (e.g., Kiviniemi, Voss-Humke, & Seifert, 2007; Lawton, Conner, & McEachan, 2009; Van der Pligt & De Vries, 1998). However, much is unknown about how affect exerts its influence on health decision making.

Throughout this dissertation, affect is contrasted with cognition. Affect in this context refers to a judgment about the pleasantness or
unpleasantness of performing a behavior. Cognition refers to a more rational evaluation, for instance whether performing the behavior would be useful or not. Affect has traditionally been attributed a peripheral role in behavioral decision making, but recent evidence suggests it is in fact a very strong determinant of behavior (e.g., Lawton et al., 2009). Two themes arising from affect’s newfound impact are at the heart of this dissertation: integrating affect and cognition into behavioral decision models, and integrating affect and cognition into health messages. These two themes are discussed in this dissertation overview.

**Integrating affect and cognition into behavioral decision models**

To fully understand the role of affect and cognition in health decision making, we need to investigate 1) their influence across the members of a population (i.e., a between-subjects perspective), and 2) individual differences in the degree to which they influence decision making (i.e., a within-subjects perspective). Most previous research on the determinants of health behavior has focused on the former, neglecting individual differences in the strength of those determinants. However, with the growing possibilities of the internet, it is becoming easier to provide individuals with information tailored to their personal style of decision making. Insights into individual differences are thus becoming increasingly important. The present dissertation examines the role of affect and cognition in health decision making from both a between-subjects and a within-subjects perspective. The next two sections discuss these two issues.
How does affect interact with cognition and other behavioral determinants?

Affect and cognition have long been regarded as components of attitude (e.g., Breckler, 1984). *Attitude* is a very global evaluation of a behavior, indicating the degree to which one considers that behavior positive or negative (Breckler & Wiggins, 1989; Crites, Fabrigar, & Petty, 1994). The notion that affect and cognition are components of attitude assumes that affect and cognition contribute to an individual’s overall judgment of a behavior. This manifests itself in the theory of planned behavior (TPB; Ajzen, 1985; Ajzen, 1991), in which the term *attitude* is used to refer to “the evaluation of an object, concept, or behavior along a dimension of favor or disfavor, good or bad, like or dislike” (Fishbein & Ajzen, 2010, p. 78). In the TPB, the definition of attitude includes global evaluations, as well as more cognitive and affective dimensions; this is in line with the idea that affect and cognition are components of attitude. The TPB postulates that one’s attitude toward a behavior – along with one’s perceived social norm and perceived control over the behavior – determines one’s intention to perform that behavior. The degree to which one intends to perform a behavior is in turn considered the main determinant of actual behavior.

Although affect and cognition have traditionally been regarded as parts of a single construct (i.e., attitude), studies have shown that they can be distinguished from each other. In addition, they can be distinguished from attitude when attitude is operationalized very globally (e.g., in terms of good versus bad; positive versus negative, etc.) (Crites et al., 1994; Trafimow & Sheeran, 1998; Van den Berg, Manstead, Van der Pligt, & Wigboldus, 2005). Consequently, a number of researchers have measured and treated affect, cognition, and attitude as distinct concepts. This raises the question how these constructs relate to each other. The traditional notion that affective and cognitive evaluations are...
summarized in a global evaluation (i.e., attitude) would suggest that they both influence attitude. Indeed, studies have found support for this (Breckler & Wiggins, 1989; Crites et al., 1994; Trafimow & Sheeran, 1998). However, some researchers have omitted attitude from their models, and treated affect and cognition as direct determinants of intention. Generally, these studies have found that both affect and cognition influence intention, and that the influence of affect is larger than that of cognition (French et al., 2005; Kraft, Rise, Sutton, & Reysamb, 2005; Lawton et al., 2009; Lowe, Eves, & Carroll, 2002). This raises two questions. First, do affect and cognition influence intention independently of attitude? The traditional notion that affect and cognition are elements of attitude suggests that their influence on intention should be largely mediated by it. If affect and cognition influence intention independently of attitude, that notion would be challenged. Second, although affect consistently was a better predictor of intention than cognition across the studies mentioned, most have looked at only one or two behaviors. Does this pattern extend to a wider range of behaviors?

Chapter Two of this dissertation addresses precisely these questions. Across a wide range of health behaviors, it investigates whether the influence of affect and cognition on intention is mediated by attitude, or whether that influence is direct. In contrast with the view that affect and cognition are elements of attitude, the results revealed that affect in particular – and for some health behaviors, cognition as well – influenced intention directly, independently of attitude. This suggests that it may be more accurate to conceive of affect and cognition as constructs separate from attitude, not as part of it. In line with previous studies (French et al., 2005; Kraft et al., 2005; Trafimow et al., 2004), the overall results indicate that affect exerts a larger influence on intention than does cognition. However, this pattern was not true for all
health behaviors. Some behaviors not included in earlier studies showed a reversed pattern. For example, intentions involving exercise and diet were more strongly determined by affect, but intentions to perform dental hygiene behaviors (such as brushing one’s teeth at least twice a day, and using toothpicks or dental floss daily) were more strongly determined by cognition. Future research could focus on identifying behavioral characteristics that predict whether a behavior is more strongly determined by affect or cognition. For example, the influence of affect and cognition may depend on whether the behavior is prevention-focused or detection-focused (e.g., using a condom [prevention] versus obtaining a test for STDs [detection]). This follows Millar and Millar’s (1993a) argument that a possible threat to one’s health is inherent in the decision to perform a detection behavior, and that such a threat is likely to generate strong emotional reactions that influence the decision. In contrast, preventive health promotion behaviors involve little threat to health. Therefore, emotional reactions should be less strong, and people may focus more on the instrumental outcomes of the behavior. Another behavioral characteristic that may explain the degree to which behaviors are determined by affect or cognition is the time-frame in which affective and instrumental consequences are expected. If the affective consequences of the behavior are expected immediately, and the instrumental consequences only in the long run (as in the case of exercise), affect may be a stronger determinant of the behavior. As the expected instrumental consequences become less distant, cognition may become a better predictor of the behavior (e.g., wearing a seat belt provides immediate safety).

The finding that affect influenced intention independently of attitude suggests that it should be measured and treated separately from attitude. Of course, separating affect from attitude immediately raises the question of where affect should be positioned relative to other
behavioral determinants. It has been suggested that affect may act as a mental shortcut in decision making (Kiviniemi et al., 2007). That is, social-cognitive variables such as those described in the TPB may result in a feeling toward a behavior which is used in future decision making. For example, if a behavior has many benefits, is socially accepted, and is easy to perform, people may associate positive feelings with it. Conversely, a behavior that has adverse consequences, is frowned upon, and is difficult to perform may be associated with negative feelings. Once that affect has formed, it may be directly used to guide future decisions with regard to that behavior. Basing a behavioral decision on affect may be a very efficient way of decision making, as monitoring feelings provides judgmental responses that are potentially faster than weighing all the pros and cons associated with a behavior (Fiske & Pavelchak, 1986; Pham, Cohen, Pracejus, & Hughes, 2001; Slovic, Peters, Finucane, & MacGregor, 2005).

If affect acts as a mental shortcut in decision making, it should mediate the influence of TPB variables on intention. This is tested across a wide range of behaviors in Chapter Three. The results indicate that affect partially mediates the influence of attitude and perceived behavioral control on intention. Thus, affect may partially act as a mental shortcut in decision making, but each of the TPB-variables also has an independent influence on intention. Still, these results, in conjunction with those in Chapter Two, strongly indicate that decision making is not merely a rational process of weighing the pros and cons of a behavior. Whereas traditional attitude theory and the TPB postulate that affect is a distal determinant of intention, influencing it through attitude, the results reported here clearly indicate that affect is a proximal determinant of behavioral intention. Affect impacts intention directly, independently of attitude and the other TPB variables. In fact, affect partly mediates the influence of some of those variables on
intention. These findings suggest that affect should be given a more prominent position in the TPB. Failing to do so will result in a severe underestimation of its influence.

How do individual differences in the extent to which decisions are based on affect and cognition influence decision making?

Most previous studies that have looked at the influence of affect and cognition on health decision making have employed a between-subjects design. Such a design allows the strengths of various behavioral determinants to be measured across a large number of individuals. In this fashion, Chapter Two indicated that, across the sample, affect was a stronger determinant of people’s intention to eat two pieces of fruit a day, whereas cognition was a stronger determinant of their intention to have dental check-ups. However, very little is known about individual differences in the degree to which people rely on affect and cognition to make health decisions. Research indicates that there are reliable differences in the degree to which individuals base their attitudes and intentions on affect and cognition (Huskinson & Haddock, 2004; Trafimow et al., 2004). Across behaviors, some individuals base their attitudes and intentions mostly on affect, whereas others base them mostly on cognition, and still others base them on both equally. Despite the potential relevance of such individual differences for health decision making and health communication, very few researchers have investigated their impact on decision making. This dissertation adds to the literature by showing that individual differences in reliance on affect and cognition predict the intention-behavior gap (Chapter Four), and that they provide a good basis for tailored health messages (Chapter Five).

The intention-behavior gap is a well-known limitation of several behavioral theories, such as the theory of planned behavior. Intention is thought to be a direct determinant of behavior, yet the empirical
relationship between the two is far from perfect (Sheeran, 2002). Persuasive communication is often targeted at determinants of intention, assuming that changes in these determinants will result in intention change and eventually behavior change. However, the intention-behavior gap implies that even if persuasive communication efforts succeed in changing people’s intentions, actual behavior may remain unchanged. Understanding the intention-behavior gap is thus imperative if the efficacy of persuasive messages is to be increased.

Chapter Four shows that individual differences in the degree that intentions are based on affect help predict the strength of the intention-behavior relationship. Individuals who base their intentions on affect more strongly are more likely to put those intentions into action than individuals who base their intentions only weakly on affect. People who neglect potential affect (e.g., physical pain, craving) when they form an intention to do something, may deviate from their intention when the behavior becomes imminent and the affective consequences become more apparent. For example, if someone’s intention to engage in exercise has no basis in the feelings associated with it, he or she may diverge from that intention and decide not to exercise when the moment of exercising comes closer and the physical discomfort becomes more apparent. In contrast, individuals who more strongly base their intentions on affect have intentions that are more predictive of behavior. Chapter Four also indicates that the degree to which individuals base their intentions on cognition does not influence the strength of the intention-behavior relationship. The findings of Chapter Four again support the notion that affect has a large impact on health decision making. They also indicate that studying individual differences helps us understand the health decision making process more thoroughly. Specifically, behavioral theories will predict health behaviors more accurately when they include individual differences in the degree to
which intentions are based on affect as a moderator of the intention-behavior relationship.

**Integrating affect and cognition into health messages**

The studies in this dissertation show that affect plays a large role in behavioral decision making. Therefore, using health messages to address people’s affect is a highly promising persuasive strategy. At present, very little is known about how affect can be effectively integrated in health messages. This dissertation responds to this gap by addressing two important questions: “What is the effect of tailoring affective and cognitive messages to individuals who tend to base their decisions on affect or on cognition?” and “Can different message characteristics that tap into the affect-cognition distinction be effectively combined in health messages?” These questions are discussed in the next two sections.

**Tailoring messages to individual differences in reliance on affect and cognition**

The previous section showed that individual differences in reliance on affect and cognition helps us to understand decision making. Such individual differences may have practical implications too. Individuals who differ in the extent to which they base their decisions on affect and cognition may respond differently to affective and cognitive means of persuasion. Two conflicting hypotheses have been proposed in response to this. The first predicts that messages are more persuasive when they match an individual’s attitude base (Edwards, 1990). That is, affective messages will be more effective in persuading individuals who tend to base their attitudes on affect, whereas cognitive messages will be more effective in persuading individuals who tend to base their attitudes on
cognition. The reasoning behind this is that addressing the dominant determinant of attitude is most effective, simply because it will have the most influence on attitude. The second hypothesis predicts precisely the opposite, namely that messages are most effective when they run counter to an individual’s attitude base (Millar & Millar, 1990). This hypothesis is based on the premise that an individual’s dominant attitude base is likely to be strong, and thus resistant to change. The non-dominant attitude base may be weaker and more susceptible to arguments; therefore, targeting the non-dominant attitude base should be more effective. Previous studies have found support for both hypotheses (e.g., Edwards, 1990; Millar & Millar, 1990; Millar & Millar, 1993b; See, Petty, & Fabrigar, 2008). Chapter Five helps explain these conflicting results by revealing that the efficacy of matching versus mismatching message strategies depends on 1) the way attitude base is operationalized (self-assessment versus structural measure), and 2) on the dependent variable (message judgment versus attitude and intention).

Two measures of attitude base are distinguished in Chapter Five: meta-base and structural base. Meta-bases are individuals’ self-assessments of their attitude bases. They are measured simply by asking individuals to what degree their attitudes are based on affect and cognition. Structural bases are a more objective measure of attitude base. They are measured by assessing individuals’ affect, cognition, and attitudes toward a number of health behaviors. The attitude scores are then correlated with the affect and cognition scores, and the strength of these two correlations is compared. Individuals whose attitude-affect correlation is larger than their attitude-cognition correlation are considered to have an affective structural base; those whose attitude-cognition correlation is larger are considered to have a cognitive structural base.
Chapter Five reveals that messages that match an individual’s meta-base are judged more positively than messages that mismatch it. This is in line with previous research suggesting that people are more interested in information that matches their meta-base (See et al., 2008). However, this is not to say that they are more persuaded by messages that match their meta-base; whether messages matched or mismatched an individual’s meta-base had no impact on attitudes and intentions.

Instead, attitude and intention were influenced by the degree to which messages matched versus mismatched people’s structural base. Messages that mismatched people’s structural base resulted in more positive attitudes and intentions than those that matched. This finding supports the mismatch hypothesis, which says that individuals’ dominant attitude bases are strong and resistant to change. A matching approach might challenge an individual’s dominant structural attitude base, thus inciting psychological reactance against the message. In contrast, a mismatching message does not challenge the dominant beliefs, since it provides a different type of information. This may be less threatening than an approach that challenges the dominant beliefs. Therefore, the recipient of a mismatching message may feel less inclined to oppose the message, making mismatching messages more persuasive than matching ones. In sum, the findings indicate that people prefer information in line with their own assessments of what determines their attitude, but they are persuaded by information mismatching their structural attitude base.

Combining message characteristics that tap into the affect-cognition distinction

Given that affect is an important determinant of health behavior, using messages that address people’s affect is a promising persuasive strategy. However, little is known about exactly how messages should
Two possibilities which have been studied in previous research are 1) using narrative (versus objective) message formats, and 2) using arguments concerning the affective (versus instrumental) consequences of performing the advocated behavior. Chapter Six studies the effects of combining these message characteristics.

Narratives are messages that present information in a personal as opposed to objective format. They are designed to engage the audience, containing emotionally appealing information, such as a first-person account of someone who has experience with the advocated behavior. In contrast, objective messages are designed to persuade people by presenting arguments in the form of facts. According to the transportation-imagery model, narratives “transport” the recipient of the message into the narrative world (Green & Brock, 2002). The mental state of being transported may be described as “an integrative melding of attention, imagery, and feelings, focused on story events” (Green, 2004, p. 247). This mental state may facilitate belief change through its potential to reduce cognitive activities that underlie resistance to persuasion, such as counter-arguing (De Wit, Das, & Vet, 2008; Green, 2004; Niederdeppe, Shapiro, & Porticella, 2011). Narratives have been shown to generate greater emotional responses from readers than objective messages (Kopfman, Smith, Yun, & Hodges, 1998; McQueen & Kreuter, 2010), suggesting they have the potential to address people’s affect.

A second technique that may be used to address an individual’s affect is using arguments that pertain to the affective consequences of the advocated behavior (rather than the instrumental consequences). For example, to persuade individuals to refrain from binge drinking, messages could argue that it prevents feelings of lethargy (affective argument), or that it prevents excessive spending (instrumental argument). Evidence shows that affective arguments address people’s affect.
whereas instrumental arguments address their cognition (Millar & Millar, 1993a). Thus, both a narrative format and affective arguments can be used to address individuals’ affect, whereas an objective format and instrumental arguments will address their cognition.

The effects of combining message format and argument have not been studied before. Chapter Six reveals that the persuasiveness of objective messages is independent of the type of argument. On the other hand, narrative messages resulted in more positive message judgment, higher perceived effectiveness, and more positive intentions when they contained affective arguments, compared to instrumental ones. Narratives including affective arguments were more persuasive than those including instrumental arguments, because they resulted in more mental transportation and less psychological reactance. This suggests that instrumental arguments do not fit well in a story about someone’s personal experiences (i.e., a narrative). Presumably, individuals expect to read about affective rather than instrumental arguments in narratives. Instrumental arguments may thus stand out, distracting the reader and resulting in reduced mental transportation and increased psychological reactance. Unlike narratives, objective messages appeal to rational processes. The reason that type of argument does not influence the efficacy of objective messages may be that both instrumental and affective consequences of a behavior are likely to be seen as valid considerations when rationally evaluating a particular behavior. For example, expecting to feel regret (affective) and expecting to think less clearly (instrumental) after binge drinking are both important considerations in one’s rational evaluation of that behavior.

The use of narratives is becoming increasingly popular in health communication. Their ability to reduce resistance to persuasion makes them a very promising tool for health promotion. Nevertheless, the relative efficacy of narrative versus objective messages varies; some
studies have found that narrative messages are more persuasive, whereas others have found the opposite (Allen & Preiss, 1997; Baesler & Burgoon, 1994). The present results provide insight into what makes an effective narrative. The type of arguments used is an important factor in the quality of narratives. Specifically, narratives including affective arguments are more persuasive than those including instrumental ones.

The research described here focused on two message characteristics that tap into the affect-cognition distinction: message format and argument type. In addition, a number of other message characteristics may also be manipulated to address people’s affect versus cognition. For example, Mayer and Tormala (2010) manipulated the framing of the arguments by exchanging the words “feel” and “think” (e.g., “I feel / think that donating blood is one of the most important contributions I can make to society”). Another strategy to tap into affect versus cognition is to describe an attitude object so that it elicits a feeling in the reader rather than describing it in an objective manner. For example, Fabrigar and Petty (1999) presented individuals with either a message designed to evoke positive emotions toward a fictitious animal, or a message containing positive information about it. Still another technique may be to include different types of images in the messages; for example, emotionally appealing photos versus graphs. Future research may add to our knowledge on affective communication by clarifying which types of manipulations most effectively address individuals’ affect versus cognition. In addition to examining the independent effects of each of these manipulations, future research should assess their combined effects. As shown in Chapter Six, choosing the right mix of message characteristics can substantially improve the efficacy of persuasive communication.
Practical implications

Chapters Two through Four highlight the importance of affect in health decision making. They found that affect is a proximal determinant of behavioral intention, and that individuals are more likely to translate their intentions into behavior if they base them strongly on affect. These results have important practical implications, suggesting that addressing an individual’s affect will be highly persuasive. Therefore, health educators should consider addressing affect in their messages.

As affect has been shown to have a large direct effect on an individual’s intention to perform health behaviors, health educators may address affect as a means to influence intentions regarding these behaviors. However, it should be kept in mind that although affect was a stronger determinant of intention than cognition for most behaviors studied, there were some exceptions. Therefore, health practitioners need to investigate which of the two determinants, affect or cognition, has most influence on the specific behavior, before developing their message.

Chapter Four reveals that individuals whose intentions have a strong affect-base are more likely to put those intentions into action than individuals whose intentions have a weak affect-base. The degree to which individuals based their intentions on cognition did not influence the intention-behavior relationship. Two practical implications may be inferred from this finding. First, affective appeals may be used not only to change individuals’ intentions, but also to help them form intentions that have a higher likelihood of being acted on. Consider, for example, a situation where someone is required to perform a behavior with which he or she is unfamiliar. In this situation, using affective information to advocate that behavior should be especially effective, as the person has not yet formed an intention with regard to the behavior.
If the first information the individual receives about the behavior is affective, his or her intention will also be affect-based and thus more likely to be put into action. Second, health interventions should ideally make room for individual differences in the degree to which intentions are based on affect. For example, strategies aimed at increasing the intention-behavior relationship – such as formulating implementation intentions and inducing distant-future time perspectives (see Gollwitzer, 1993; Strathman, Gleicher, Boninger, & Edwards, 1994) – should be especially effective with individuals who give little consideration to affective factors when forming their intentions, as these individuals have a large intention-behavior gap.

Individual differences in reliance on affect or cognition can also be used as a basis for tailored communication. Chapter Five reveals that individuals judge messages more positively when they are in line with their meta-base (i.e., their self-assessment of whether their attitudes are more strongly determined by affect or cognition). For example, individuals who evaluated their attitude base as cognitive, had a preference for messages pointing out the instrumental (versus affective) consequences of the advocated behavior. However, the interaction between meta-base and argument type did not go beyond message judgment. Whether messages matched or mismatched people’s meta-base made no difference for attitude and intention change. This means that to communicate persuasively, health educators should not rely on tailoring their messages to meta-bases. However, as people do have a preference for information that matches their meta-base, matching an individual’s meta-base could be a good strategy when the aim is not to persuade, but to inform.

Instead of using meta-base, health educators can use structural base (i.e., a correlational measure of whether an individual’s attitudes are more related to their affect or cognition) to develop persuasive
tailored communication. To change people’s attitudes, the common practice in health communication is to target the beliefs that are most strongly related to an individual’s attitudes. Chapter Five shows that this is not always the most effective strategy. At least in the context of binge drinking, messages mismatching people’s structural base resulted in more positive attitude and intention change than messages matching them. Instead of attacking individuals’ dominant beliefs, which are likely to be resistant to change, health practitioners should consider targeting less dominant beliefs, since these are more susceptible to arguments.

A final important practical implication of the findings presented in this dissertation concerns the content of narrative messages. The use of narratives may be an effective strategy to persuade people (Baesler & Burgoon, 1994), not in the least because they tap into an individual’s affect (Kopfman et al., 1998; McQueen & Kreuter, 2010). However, it is important for health educators to note that the efficacy of narratives is highly dependent on the type of arguments used in them. Narratives that include affective arguments result in less psychological reactance and more mental transportation than narratives with instrumental arguments. Because of this, narratives that present affective arguments are more persuasive than those with instrumental ones. Health educators are thus advised to include affective instead of instrumental arguments in their narrative messages.

**Persuasion through facts or feelings?**

The studies described here clearly show that affect plays a major role in people’s health decisions. As such, it should be given a central position in theories on behavioral decision making. Does this mean that health messages should address feelings instead of facts? Not quite. Though affect is important, traditional social-cognitive determinants
still have a large influence on decision making. In addition, there are large individual differences in the degree to which people base their decisions on affect and cognition, differences which are directly linked to their susceptibility to affective and cognitive messages. Thus, not all people are susceptible to affective persuasion. That said, affect exerts a larger influence on health decisions than previously thought, and there is great merit in directing our attention to it. Health communicators need to consider affect as an essential target of their persuasive messages.