AFFECTIVE AND COGNITIVE META-BASES OF ATTITUDES:
UNIQUE EFFECTS ON INFORMATION INTEREST AND PERSUASION

DISSERTATION

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ABSTRACT

One prominent way in which persuasive messages can differ is whether they focus on a recipient’s emotions regarding some issue versus the recipient’s beliefs about the issue. The current research investigated the possibility that the mere perception that one’s attitudes are based on affect (versus cognition) can influence interest in an affect-laden or cognition-focused message as well as persuasion to these messages. Past research has focused on whether one’s attitude is actually dominated by affect or by cognition, whereas the present research examines the utility of people’s subjective assessments of whether their evaluations are affect- or cognition-driven (i.e. meta-bases) as separate from whether people’s attitudes are actually affect- or cognition-based (i.e. structural bases). Studies 1 and 2 demonstrate that meta-bases uniquely predict interest in affective versus cognitive information above and beyond structural bases and other related variables (e.g., need for cognition and need for affect). In addition, Study 3 shows that meta-bases account for unique variance in attitude change as a function of whether the appeal elicits emotions or generates thoughts about attributes. Finally, Study 4 shows that meta-bases are predictive of information interest when people are relatively deliberative in their responses whereas structural bases predict information interest when
people are relatively spontaneous in their responses. Future directions for research on
meta-bases, as well as general implications of the meta-structural distinction, are
discussed.
Dedicated to my parents (See Leong Gan and Koh Wah Lee)

and my brother (See Chun Yang, Eric)
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CHAPTER 1

INTRODUCTION

Every day, we are inundated with a variety of appeals asking us to do various things – to quit smoking, to buy a car, to wear a seat belt, to vote for an issue or a candidate, and so forth. Frequently, these messages are tailored in some way so that various audiences can appreciate them. For instance, anti-smoking messages can either focus on resisting peer pressure or protecting children’s health, depending on whether the intended audience is teenagers or parents. Another example more relevant to the current research is anti-smoking appeals that emphasize negative emotions such as the fear of dying from lung cancer, or that highlight the undesirable characteristics of smoking such as the harmful effects of cigarettes on our health and consequently, our productivity. Given both an emotions-focused message and an attribute-focused message, which will draw more interest or be more persuasive? Prior research has established that an emotions-focused appeal is more persuasive for people whose existing attitudes are based primarily on emotion than cognition, whereas the opposite is true for an attribute-focused appeal (e.g., Fabrigar & Petty, 1999). The current research examines whether the mere perception that one bases one’s attitudes primarily on feelings or on beliefs can be an
important determinant of one’s interest in attitude-relevant information and attitude change.

Attitudes refer to one’s overall degree of favorability toward entities that include objects, issues, and people, and are important as they can influence behavior. Besides the attitude itself, which by definition, refers to the *valence* of one’s evaluation of the object, various strength properties of the attitude have been established as important separate constructs, because these properties determine the consequences of attitudes such as how stable the attitude is over time, its ability to resist change, and its impact on behavior (e.g., see Krosnick & Petty, 1995). An example of a strength-related property of attitudes is the accessibility of the attitude (e.g., Fazio, 1995). An individual can have a positive *or* a negative attitude toward smoking regardless of how quickly that attitude comes to mind. Beyond strength-related features, the specific *basis* of an attitude is also a separate property that matters. Attitudes can be based on affect or cognition (e.g., Crites, Fabrigar, & Petty, 1994), or on image versus quality concerns (e.g., Snyder & DeBono, 1985). Such attitudinal bases can be independent of valence. For example, an individual who relies on emotions in his or her attitudes can have an equally positive (or negative) attitude as another person who relies on beliefs. One important consequence of an individual’s attitudinal basis is persuasion. As discussed earlier, attitudinal bases influence attitude change as a function of the type of appeal.
Before discussing attitudinal bases in more detail, I will describe briefly a related issue that has received much attention in research on overall attitudes—the measurement of attitudes. In particular, contemporary theorists have distinguished between implicit and explicit measures of attitudes (see Fazio & Olson, 2003, for a detailed review of implicit measures). Although there are differences among the various implicit measures proposed, in general, such measures attempt to assess one’s automatically activated evaluation of an object, and do so in a manner that does not require awareness of what is being assessed. In contrast, explicit measures are direct assessments of participants’ more deliberative attitudes so that people are aware that they are reporting their attitudes. Some theorists consider implicit measures to be relatively objective indicators of attitudes, whereas explicit measures are more subjective.

Similar to attitudes, attitudinal properties have been assessed with some measures that can be considered subjective and others that are relatively objective. Subjective measures refer to people’s perceptions of some quality of an attitude (e.g., how much knowledge do they think they have about the attitude object; how conflicted do they feel toward the attitude object), whereas objective measures are used to gauge these same qualities more directly (e.g., the number of pieces of information they can generate about an object; the number of positive and negative reactions they have toward the object; see Wegener, Downing, Krosnick, & Petty, 1995). In much of the literature, it has been
common to treat both types of measures as if they represent a single underlying construct. For instance, researchers have sometimes used meta-attitudinal (i.e. subjective) and structural (i.e. objective) measures of the same attitudinal property as alternative operationalizations of each other. For example, in one study conducted by Davidson, Yantis, Norwood and Montano (1985), knowledge was operationalized as the number of relevant pieces of information that the participant generated in 2 ½ minutes. In other studies within the same research, knowledge was operationalized as the extent to which the participant reported being well-informed with respect to the object. The same outcome, attitude-behavioral intention consistency, was expected and obtained for both the structural and meta-attitudinal measures of knowledge.

Attitudinal ambivalence is another property for which researchers have treated structural and meta-attitudinal measures as tapping the same construct. In this case, self-reported ambivalence has typically been viewed as the criterion for establishing the validity of objective measures of ambivalence that assess conflicting positive and negative components (e.g., Priester & Petty, 1996; Thompson, Zanna, & Griffin, 1995). However, some attitude theorists have noted the potential importance of treating these two types of measures as reflecting distinct constructs rather than just alternative methods of assessing the same construct (e.g., Bassili, 1996; Krosnick & Petty, 1995; Visser, Bizer & Krosnick, 2006; see Figure 1). These distinct constructs will be referred to as
meta-attitudinal properties and structural properties of attitudes, respectively. The former result from participants’ subjective perceptions of an attitudinal property whereas the latter represent components in the cognitive architecture of an attitude.\(^1\)

In the current research, I introduce a new metacognitive feature of attitudes that has previously been examined only in its structural form. Whereas prior research has examined whether attitudes are *structurally* based primarily on affective or cognitive information (e.g., Crites et. al., 1994; Eagly Mladinic, & Otto, 1994), the present studies examine the possible importance of people’s meta-bases, which refer to people’s perceptions of the affective-cognitive nature of their attitudinal bases. In prior work, affective versus cognitive structural bases of attitudes have been assessed by measures that examine how well people’s affective reactions to an attitude object predict overall evaluation compared to their cognitive reactions. In some research, assessments of the affective and cognitive components followed expectancy-value models of attitudes (e.g., Fishbein & Ajzen, 1975), where each component reflected both the frequency with which a self-generated belief and emotion applied to the target object and the valence of those individual beliefs or emotions (e.g. Eagly et. al., 1994; Esses, Haddock, & Zanna, 1993). In other research, assessments of the components include only the valence of various beliefs and emotions that were provided for the participant (e.g., Chaiken, Pomerantz, & Giner-Sorolla, 1995; Fabrigar & Petty, 1999). In either case, participants know that they
are reporting their reactions to an attitude object but they do not necessarily know that their reliance on affect versus cognition in their attitudes is being examined. The present research assesses people’s meta-bases by asking them directly for their perceptions regarding the extent to which they rely on affect or cognition in forming attitudes.

The Importance of Meta-bases

Research on attitudes has established the importance of various types of meta-attitudinal judgments. One example is subjective perceptions of one’s ambivalence. In one study, subjective ambivalence interacted with attitudinal importance to influence context effects in attitude reports, such that people who experienced mixed reactions to an attitude object that was important to them were most likely to vary their responses according to the set of questions in which the target question was embedded (Tourangeau, Rasinski, Bradburn, & Andrade, 1989). Subjective ambivalence was also found to mediate the effects of an attitudinally heterogenous social network on susceptibility to attitude change, such that people who had relationships with attitudinally dissimilar others experienced greater ambivalence and thus, were more persuaded (Visser & Mirabile, 2004).

People’s assessments of their attitude-relevant knowledge have also been demonstrated to be an important variable. As discussed earlier, some research showed that people who perceived themselves to be knowledgeable regarding the attitude object
were more likely to engage in behavior consistent with those attitudes than those who had lower perceptions of knowledge (Davidson et. al., 1985; Studies 2 and 3). In addition, other research showed that meta-knowledge moderated the disrupting effects of analyzing reasons such that people who perceived themselves to know party candidates well did not change their attitudes after expressing reasons for their attitudes (Wilson, Kraft, & Dunn, 1989; Study 2).

Notably, in the research reviewed above, the structural counterparts of the subjective assessments were not measured. Thus, it is possible that these subjective perceptions were impactful to the extent that they overlapped with structural properties. In the current research, meta-bases and structural bases of attitudes are always simultaneously assessed within the same study because the goal is to show that meta-bases can contribute to attitudinal phenomena above and beyond the contribution of structural bases.

The Importance of Structural Bases

Before discussing the potential influences of meta-bases, I first turn to past research on the affective versus cognitive bases of attitudes as assessed with structural measures. Research in this domain began with a conceptual distinction between the affective and the cognitive bases of attitudes (e.g., Katz & Stotland, 1959; Zanna & Rempel, 1988). Affect refers to the positive and/or negative emotions that the attitude
object generates such as excitement or sadness whereas cognition refers to the positive and/or negative beliefs people hold about the attitude object such as usefulness or harmfulness. In addition, affect and cognition themselves can influence each other (see Eagly & Chaiken, 1993). Although one can experience emotions that stem from beliefs, (e.g., excitement about a robot vacuum cleaner because it is extremely useful) or hold beliefs about affect (e.g., the belief that a drug is useful because it induces relaxation to help one sleep), the present research emphasizes global attitudes as driven relatively more by emotions than beliefs, or vice versa. An example is favorability toward a drug more because of its relaxing properties than because of its usefulness or negative attitudes toward cigarette smoking because one finds it disgusting rather than because of the negative health implications.

In addition to being driven by affect versus cognition, various theorists have articulated other sorts of attitude bases. For example, Snyder and colleagues have noted that people who differ in their underlying motives (e.g., as assessed with the self-monitoring scale, Snyder, 1974) can have attitudes based on different kinds of information (i.e., image versus quality; see Snyder & DeBono, 1985). The present research focuses on affectively-based versus cognitively-based attitudes as a starting point for the examination of the utility of the meta-bases construct.
Much empirical work has established that affect and cognition do exert separate influences on various attitudes (e.g., Breckler, 1984, Breckler & Wiggins, 1989). Prior research has established that attitudes can vary in their bases with some being dominated by affect and others by cognition. For instance, Crites and his collaborators (1994) found that attitudes toward snakes and math were driven primarily by emotions rather than beliefs, whereas attitudes toward capital punishment were based more on beliefs than emotions. Additional research has also shown that attitudes can be generally more affectively- or cognitively-based between individuals who hold those attitudes rather than between attitude objects. That is, some individuals tend to base their attitudes primarily on affect whereas others tend to base them on cognition (e.g., Crites et. al., 1994; Huskinson & Haddock, 2004). As an initial investigation of meta-bases, the current research uses this individual differences approach. This is because if people have a general orientation toward many attitude objects, such an orientation would be more useful (i.e., predictive across a range of attitude objects) than if the perceived bases varied markedly from object to object.

Knowing whether an attitude primarily has an affective or cognitive structural base has important implications for attitude formation and change. With respect to persuasion, the dominant finding is for a matching effect. That is, people appear to be more influenced by persuasive messages that correspond to the structural basis of their
attitudes (Edwards, 1990). For example, in one study, relative to individuals with cognition-based attitudes, individuals with affect-based attitudes formed more positive attitudes toward an unknown beverage after an affective appeal than a cognitive appeal (Huskinson & Haddock, 2004). In another instance, attitudes that were experimentally created to be affect-based were more susceptible to persuasion by an affective appeal than attitudes induced to be cognition-based (Fabrigar & Petty, 1999; see Millar & Millar, 1990, for an exception).

Meta-attitudinal Constructs as Independent of Their Structural Counterparts

A key idea of this dissertation is that people’s meta-bases will contribute to attitudinal phenomena above and beyond that contributed by structural bases. There are various reasons to expect that meta-bases are independent of structural bases of attitudes. First, past research suggests that for all of the various properties of attitudes that have been examined in the literature so far, meta-attitudinal measures are not redundant with their structural counterparts. For example, meta-attitudinal reports of ambivalence and structural measures have typically been found to be only moderately correlated (e.g., rs ranged from .21 to .44; Priester & Petty, 1996; Thompson et. al., 1995). Similarly, subjective reports of knowledge and measures of actual knowledge listed have usually been only weakly correlated (rs ranged .14 to .29; e.g., Krosnick, Boninger, Chuang, Berent, & Carnot, 1993; Wood, Rhodes, & Biek, 1995) and have shown differential
predictive utility (e.g., Holbrook, 2002). In other research, factor analyses revealed that meta-attitudinal and structural measures do not represent the same underlying factor. For example, meta-response time, meta-extremity, and meta-ambivalence did not consistently load on the same factor as their operative counterparts (i.e. actual response latency, objective extremity and objective ambivalence; see Bassili, 1996).

In other research, two-factor models in which the two underlying latent factors were meta-attitudinal and structural constructs respectively provided better fit than single-factor models in which meta-attitudinal and structural constructs were not distinguished from each other (Holbrook, 2002). The fit superiority of the two-factor model over the one-factor model was obtained across three different strength-related properties (i.e. knowledge, ambivalence, and accessibility) and across various issues (i.e. legalized abortion, capital punishment, and defense spending). Therefore, past research suggests that people’s meta-attitudinal judgments of some aspect of attitudes need not correspond to the structural properties of those attitudes. This may not be surprising given that people do not have direct access to their psychological processes, including why their attitude toward an object is positive or negative (Nisbett & Wilson, 1977).

Indeed, past research suggests that when people think about their attitudinal bases, what comes to mind may not be representative of the structural content of attitudes (Wilson, Dunn, Bybee, Hyman, & Rotondo, 1984). For instance, prior research has
found that when people were asked to examine why they liked or disliked an attitude object, participants reported attitudes that were correlated with those reasons, but these attitudes did not predict behavior (Wilson et al., 1984). Wilson and colleagues proposed that this was due to participants’ inability to comprehensively identify the actual basis of their attitudes – often underestimating the affective basis. Moreover, even if people identify a representative sample of the bases of attitudes, they must be able to effectively gauge the unique contributions of each basis to their global evaluation. This is likely to be a difficult task, particularly in cases where affect and cognition are evaluatively consistent. For instance, if one knows that one has an overall positive attitude toward a drug, it might be hard to figure out how much of one’s overall positivity stems from the feeling of relaxation induced by a drug and how much is due to the utility of the drug.

The notion that difficulty in judgments leads to inaccurate judgments is not only intuitive but evident in research on inaccuracies in self-assessments regarding one’s skills. Although the desire to see oneself in a favorable light has been established as a source of overly positive self-judgments, the difficulty of understanding what these skills require also leads to inaccurate self-assessments. For example, Kruger and Dunning (1999) found that participants who are in the bottom quartile on tests of reasoning are the ones who overestimate their skills. Presumably, these are the participants who find it hard to grasp what reasoning skills require. Indeed, when bottom-quartile participants received
training in logical reasoning, they became more accurate in their estimation of their reasoning skills than other bottom-quartile participants who were not trained in reasoning. In other words, when reasoning became easier for people who had initially found it difficult, self-assessments about reasoning also became more accurate.

Since identifying one’s own attitudinal bases is also a difficult task, I expect people to be inaccurate in their perceptions of their attitudinal bases (i.e. meta-bases). Nonetheless, given past research demonstrating the consequences of subjective judgments regarding other attitudinal properties such as knowledge and ambivalence, I argue that these lay perceptions of one’s attitudinal bases can still be consequential. That is, the mere subjective belief that one’s attitudes are based primarily on affect or cognition, independent of the actual or structural bases of attitudes, could have important implications for the manner in which people acquire information, respond to that information, and use it to guide their behaviors.

The Present Research

The current research has several goals. The first is to provide evidence regarding the existence of affective versus cognitive meta-bases as distinct from structural bases. Following past work on the structural bases of attitudes, I assess meta-bases as a property of individuals (e.g., Huskinson & Haddock, 2004). One reason for this is that it matches the level at which I conceptualize meta-bases. Metacognitive judgments regarding the
bases of one’s attitudes, like other metacognitions, can arise from momentary experiences or from enduring lay theories (see Nelson, Kruglanski, & Jost, 1998). An example of a momentary metacognitive judgment is confidence in a recently generated thought due to recent validation from other people (Petty, Briñol, & Tormala, 2002). An example of a chronic metacognitive judgment is an individual’s lay theory about whether a particular factor (e.g., mood) leads to assimilation or contrast in attitudes (e.g., see Wegener & Petty, 1997). The approach I use is to view meta-bases as a chronic individual difference that applies across attitude objects. As will be evident in the details provided in the methods sections, the current research will measure meta-bases in a manner that is equivalent to (and thus, comparable with) that of structural bases. It is also possible to view both meta-bases and structural bases at the level of the specific attitude object. For maximum generality, however, the current research uses an individual differences rather than an individual attitude object approach.

In addition, I use the discrepancy between affective and cognitive bases (either structural or meta) within an individual as an index of the individual’s meta- or structural base, such that an individual is either relatively high in affective bases and low in cognitive bases or relatively low in affective bases and high in cognitive bases (see Haddock & Zanna, 1994, for a similar method of assessment).3 Certainly, it is possible for individuals to be high in both affective and cognitive bases or low in both bases.
However, it is unlikely that the extent to which an individual relies (or does not rely) on both affective and cognitive bases are exactly equal. In other words, even among some people who are high in both affective and cognitive bases, or other people who are low in affective and cognitive bases, there could be a preference for one type of basis over the other. Stated differently, regardless of whether such a preference is small (for instance, among individuals who are high in both bases or low in both bases) or big (for example, among individuals who are high in one basis but low in the other basis), the relative preference could be meaningful.

The second objective of the current research is to examine the practical and conceptual utility of assessing meta-bases by establishing that such subjective judgments are related to important attitudinal processes and that these effects remain after taking into account the influence of structural bases and/or other relevant individual difference variables. Since the goal of the present research is to establish the existence of effects of meta-bases for the first time, I first attempt to demonstrate the utility of meta-bases in contexts that seemed optimal for finding them.

What attitudinal processes might meta-bases be expected to predict? A straightforward prediction is that individuals who perceive themselves to generally rely on affect in their attitudes would be more interested in and tend to seek out information that is explicitly affective when making decisions, whereas those who perceive
themselves to rely more on cognition would be interested in and tend to seek out information that is explicitly cognitive. Stated differently, I expect meta-bases to predict behaviors that people engage in deliberatively, such as using certain aspects of some object to determine one’s preferences (e.g., focusing on the affective or cognitive qualities of a fiction book prior to selecting it) or selectively reading information at one’s own pace. This is because past research on general metacognitive judgments suggests that such judgments impact behaviors especially when participants are responding thoughtfully. For example, in their examination of self-validation processes, Petty and his collaborators (2002) found that given some information for which participants generated thoughts, participants’ confidence in those thoughts interacted with the direction of those thoughts to influence attitudes. Of relevance, confidence in thoughts mattered most among people who were thinking about the information carefully and thus, deliberative in using their thoughts to form attitudes. Since prior work on meta-cognition has suggested that meta-cognitions matter more under high than low thinking conditions (see Petty, Briñol, Tormala, & Wegener, 2007, for a review), my research examined situations in which people were likely to be at least somewhat deliberative about the information they received.

An important prediction of the current research is that both structural and meta-bases can be important and independent predictors of attitude-relevant behavior. I have
already noted why these concepts were not necessarily redundant. Why should they predict different behaviors or independently predict the same behavior? To address this, some parallels might be drawn between the meta-structural distinction in attitudinal bases and the implicit-explicit distinction in global attitudinal measurement. As mentioned before, explicit measures of attitudes are assessments of people’s subjective and conscious reports of their evaluations toward an object, whereas implicit measures of attitudes assess automatic reactions that presumably more directly reflect structural associations between objects and evaluations. Although very little prior research on attitudinal properties has simultaneously examined the independent contributions of meta-attitudinal and structural assessments of those properties within the same study, research on overall attitudes have included these two types of measures in the same study. One common finding in the domain of overall attitudes is that explicit and implicit measures have been established to predict different behaviors. For example, explicit measures of attitudes toward Blacks predicted self-paced ratings of a race-related incident whereas implicit measures of prejudice predicted friendliness of spontaneous behavior toward the Black experimenter (Fazio, Jackson, Dunton, & Williams, 1995, Study 1). In another instance, explicit prejudice assessments predicted deliberative race-related responses such as ratings of a Black experimenter whereas implicit prejudice assessments
predicted spontaneous behaviors such as visual contact with the experimenter (Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997).

In addition, explicit and implicit measures of attitudes have also been established to independently predict the same behaviors. One example is research establishing that explicit and implicit measures of attitudes toward political conservatism independently predicted participants’ request for information from either College Republicans or Democrats (e.g., Vargas, von Hippel, & Petty, 2004). Requesting information might be a behavior that involves deliberative (e.g., elaborating upon potential differences between information from one source or the other before making a selection) and spontaneous (e.g., using one’s self-identity as a heuristic to form a preference) processes. Another example is in the domain of attitudes toward oneself (i.e., self-esteem), where explicit and implicit assessments independently predicted the tendency to report excuses for anxiety during an interview (Spalding & Hardin, 1999). Again, the use of excuses to protect one’s self-esteem might comprise deliberative (e.g., selecting excuses after consideration of the extent to which each excuse is applicable) and spontaneous (e.g., selecting excuses that are most accessible) elements. Similarly, in the absence of constraints on thinking, selective interest can be a behavior that one engages in while thinking a lot (e.g., by carefully considering aspects of all of the information that one receives and then selecting aspects that one perceives to be important), a behavior that
one performs without much thinking (e.g., automatic attention to aspects of the information to which one is drawn), or a behavior that comprises both deliberative and spontaneous components (e.g. going back and forth between automatic attention and careful consideration of the relevant aspects).

Since I am interested in demonstrating the importance of meta-bases, the current research operationalizes selective information interest as behaviors that one can engage in deliberatively. Therefore, I expect meta-bases to predict such behaviors as using explicitly affective and cognitive information to form preferences and reading explicitly affective and cognitive information at one’s own pace. However, to the extent that spontaneous components idiosyncratic to the tasks are also involved, structural bases would also be expected to determine information interest. Therefore, Studies 1 and 2 examined the relationship between meta-bases and selective interest in information, while controlling for the effects of structural bases. In addition, as described in more detail shortly, Studies 1 and 2 also included individual difference variables that might be related to interest in affect and cognition more generally (e.g., individual differences in need for affect and need for cognition).

Another objective in the current research is to examine the unique effects of meta-bases on the most studied consequence of the affective versus cognitive bases of attitudes – persuasion. Recall that prior work on the structural bases of attitudes provided
evidence for a matching effect between attitudinal bases and the type of appeal. As noted before, past studies have demonstrated that implicit and explicit measures of global attitudes can sometimes independently predict the same behavior. Therefore, it is possible that structural and subjective assessments of one’s attitudinal bases will independently predict persuasion, though probably via different processes. As I explain further in introducing Study 3, I expect that meta-bases will also produce a matching effect that was independent of the impact of structural bases.
CHAPTER 2

STUDY 1

In Study 1, I aimed to fulfill two goals. First, I wanted to examine the effects of meta-bases on interest in affective versus cognitive information, controlling for structural bases. Information interest was operationalized as the extent to which participants relied on an object’s affect-cognition quality to determine their preference for the object. Thus, participants received information regarding various attributes of various books and ranked these books according to how interested they were in reading them. Since participants could take as long as they wanted to consider the information before making decisions, I expected meta-bases to predict their interest in relying on affective and cognitive aspects of the books in forming preferences. As mentioned before, there could be spontaneous processes involved in this task so I also measured structural bases in Study 1 for exploratory purposes.

Another goal of Study 1 was to distinguish meta-bases from possibly similar constructs that have already been examined in the literature. One such construct is need for cognition (NC; Cacioppo & Petty, 1982), which is measured by asking people directly how much they enjoy cognitive challenges and how often they engage in mentally
complex activities. Much research has shown that NC determines whether people’s attitudes are based on processed information or on peripheral cues (see Cacioppo, Petty, Feinstein, & Jarvis, 1996, for a review). Another potentially relevant construct is need for affect (NA; Maio & Esses, 2001) which is measured by asking people directly about the extent to which they approach and avoid emotion-arousing events. NA influences people’s willingness to view emotions-focused films (Maio & Esses, 2001) as well as people’s actual reliance on affect in attitudes, a structural criterion (Huskinson & Haddock, 2004).

Despite apparent similarities between meta-bases and the constructs of NC and NA, I argue that meta-bases are not redundant with NC and NA. For example, individuals high in NC may believe that their attitudes are driven as much by extensive thinking about emotions as by thinking about attributes. That is, although people high in NC like to think, they might think as much about emotional factors as cognitive ones and thus be equally interested in both types of information. As for a high NA individual, he or she may seek out affect-arousing stimuli for the sake of experiencing emotions in general but not necessarily for the purpose of explicitly forming evaluations.

Furthermore, even if meta-bases stem in part from individual differences in NC and NA, these two well-established variables are not likely to be the sole determinants of meta-bases. For example, people might also develop their meta-bases from cultural
expectations (e.g., it may be more accepted for women to rely on emotions than men). Nevertheless, to rule out redundancy between meta-bases and NC and NA, measures of the latter two variables were included in Studies 1 and 2.

Method

Participants and Overview of Procedure

Forty-four introductory psychology students at Ohio State University completed the study in return for partial course credit. Participants were told that they would be completing various studies so that they would not develop expectations about relationships between the measures. The first study presumably assessed personality. Participants completed the need for affect and need for cognition scales. The order in which the scales were presented was counterbalanced across participants. In the second study, participants indicated their structural and meta-bases toward five different attitude objects, one object at a time. By collapsing across these attitude objects, a measure of structural and meta-bases as a general tendency (i.e., individual difference) could be calculated.

Following these measures, participants engaged in a study described as an investigation of how people make decisions about what fiction books to read. Participants were then presented with information about different books before ranking the books according to their interest in reading them. All materials were presented using medialab.
software (Jarvis, 2005). Sample items for the materials for this study are included in Appendix A. Finally, participants were debriefed and thanked.

Predictor Variables

Need for cognition. Participants completed the 18-item need for cognition scale (Cacioppo, Petty, & Kao, 1984). Examples of items are “I would prefer complex to simple problems,” and “Thinking is not my idea of fun (reverse-coded).” Participants responded to each item on a 5-point scale anchored at (1) extremely uncharacteristic of me and (5) extremely characteristic of me. The items on this scale were highly intercorrelated ($\alpha = .86$) so they were summed to form a composite score. Scores ranged from 42 to 84 and the median score was 66.

Need for affect. Participants also completed the 26-item need for affect scale (NA; Maio & Esses, 2001). Responses to each item were made using a scale from -3 (strongly disagree) to 3 (strongly agree) and were recorded by medialab as if they were made on a scale with endpoints 1 and 7. The NA scale consists of a subscale with 13 items that assess the motivation to approach emotions ($\alpha = .88$) and another subscale with 13 items that assess the motivation to avoid emotions ($\alpha = .85$). An example of the former subscale is “I feel that I need to experience strong emotions regularly”; an example of the latter subscale is “If I reflect on my past, I tend to be afraid of feeling emotions.” Following recommended procedures (Maio & Esses, 2001), the final score was computed by
subtracting the scores on the latter 13 items from the former 13 items. Scores ranged from -32 to 48 and the median score was 22.

**Structural bases.** In order to assess participants’ structural bases, I used a measure adapted from one successfully employed in prior research by Huskinson and Haddock (2004). Specifically, participants were given instructions to indicate the feelings that they had toward an attitude object. They reported the extent to which they had positive feelings toward the object on semantic differential scales (e.g., annoyed-happy). Then, participants were told to indicate beliefs they had about the attitude object using semantic-differentials (e.g., useless-useful). Finally, they reported their overall attitudes, again using semantic-differentials (e.g., negative-positive). After reporting their affective, cognitive, and attitudinal responses as well as meta-bases (see below) for one attitude object, participants then repeated the procedure for another attitude object until they completed responses for five different attitude objects. The order in which participants reported their feelings and beliefs was counterbalanced across the five different objects for each participant.

The semantic-differential items were taken from prior research by Crites et. al. (1994). The five attitude objects were abortion, birth control, capital punishment, exercising, and spiders. The order in which the attitude objects were presented was counterbalanced across participants. This group of five attitude objects were selected
from a larger set that had been used in past research (e.g., Huskinson & Haddock, 2004), with the intention that the group of objects consisted of some objects that generally elicit affect-based attitudes and others that elicit cognition-based attitudes. For instance, birth control is an issue that tends to elicit affect-based attitudes for most individuals whereas capital punishment is an issue that tends to elicit cognition-based attitudes (Crites et. al., 1994).

To create a structural bases index, two correlations were computed for each participant. One correlation reflected the relationship between the participant’s affect and attitude. The other measured the relationship between the participant’s cognition and attitude. These correlations were then converted to Fisher’s z values. Finally, participants’ cognition-attitude correlations were subtracted from their affect-attitude correlations such that the higher a participant’s final score, the more the participant’s attitudinal structure across the five diverse attitude objects is dominated by affect rather than cognition (see Haddock & Zanna, 1994).

Meta-bases. After reporting their structural bases for each of the five attitude objects, participants indicated their meta-bases for the same object by responding to the following questions: 1) “To what extent do you think your attitudes toward (insert attitude object) are driven by your emotions?” and 2) “To what extent do you think your attitudes toward (insert attitude object) are driven by your beliefs?” To compute an index
for participants’ meta-bases, participants’ responses to the beliefs question across the five attitude objects were averaged. The same was done for their responses to the emotions questions. Finally, standardized values for each participant’s averaged responses to the beliefs questions were subtracted from standardized values for the participant’s averaged responses to emotions questions. Therefore, higher scores indicated more affective meta-bases.

*Dependent Measure: Information Interest*

To assess interest in affective versus cognitive information, participants were presented with information about six fiction books. Three of the excerpts were about books that aroused emotions (books A, D, and F). The other three excerpts referred to books that stimulated thoughts (books B, C, and E). An example of an affective book’s excerpt is “…this gripping story is full of twists and turns that leaves readers in jaw-clenching suspense…” An example of an excerpt for a thought-provoking book is “…the writer raises questions regarding the ethical implications of technological advances…” The books were similar in their overall ratings from the critics. Appendix A contains excerpted reviews and overall ratings that participants were told came from published criticisms of the six books.

Participants also received an information grid that contained ratings presumably from last quarter’s students. This procedure was adapted from past research by Wegener
and Petty (1994). Each book was rated on four dimensions: 1) the extent to which the book stimulates thinking, 2) how well-developed the characters are, 3) the extent to which the book elicits emotions, and 4) how distinctive the writing style is. The three affective books (books A, D, and F) received the lowest ratings on the extent to which they stimulated thinking and the highest ratings on the extent to which they aroused feelings. In contrast, the cognitive books (books B, C, and E) received the highest ratings on the extent to which they stimulated thoughts and lowest ratings on the extent to which they elicited emotions. Ratings of the irrelevant features (character development and writing style) were evenly distributed across the affective and cognitive books, such that the summed ratings on all four dimensions were 13 for each book. Appendix A contains the ratings for each book on the dimensions. After reading the excerpts and the ratings, participants were asked to rank the six books according to how much they would like to read them. The six books were presented in a random order during the ranking task.

It is worth noting that although participants were presented with four dimensions, they could simultaneously consider only two dimensions – the affect-cognition quality and the character-style quality. That is, a participant could rank a book based on the extent to which the book is thought-stimulating or the extent to which it arouses affect. The participant could at the same time consider the extent to which the book has good character development or a distinctive writing style. This is because a thought-
stimulating book is always low in its emotion-arousing quality, but could have no character development or excellent character development. The same goes for an affect-arousing book, which is never one that stimulates thoughts, but could have poor or excellent character development. Similarly, a book with distinctive writing style always has poor character development but could be one that elicits thoughts or emotions.

To examine participants’ reliance on the dimensions in their book preferences, two indices were created for each book. One index reflected the extent to which the book is affective rather than cognitive. Another index represented the degree to which the book has good character development rather than a distinctive writing style. That is, every book was ranked on each dimension relative to the other books. I then reverse-coded ranks on the cognition and acting dimensions and averaged the reverse-coded ranks with ranks on the affect and special effects aspects, respectively. This means that higher ranks refer to greater extents of affect relative to cognition and of better character development relative to writing style, respectively.

**Results**

*Relationships Among the Predictors*

I first assessed the relationships between meta-bases and other similar constructs. Participants’ meta-bases did not correlate with their structural bases, $r(41) = .02, p = .88$, thus suggesting that meta-bases were independent of structural bases. The absence of a
relationship is notable given that these measures were taken right after each other. In addition, more affective meta-bases were associated with higher need for affect (NA), $r_{(42)} = .30, p < .05$ and lower need for cognition (NC), $r_{(42)} = -.33, p < .05$. Table 1 contains all correlations among meta-bases, structural bases, NA, and NC.

**Information Interest**

As a first step in the analyses, two Spearman rank-order correlations were computed for each participant. One correlation was between the participant’s book ranking and the book’s affect-cognition quality, and reflects the extent to which the participant attends to the book’s affect-cognition quality and uses the dimension to determine overall preference for the book. Another correlation was between a participant’s book ranking and the book’s character-style quality, and reflects the extent to which the participant uses the book’s character-style quality to determine his or her preference for the book.

When individuals’ meta-bases were entered as the only predictor in the model, they predicted the relationship between a participant’s ranking of a book and the book’s affect-cognition quality, such that the more affective one’s meta-bases, the greater the relationship, $\beta = .54, t_{(42)} = 4.06, p < .001$ (all $\beta$s reported in the current research are standardized coefficients). In particular, neither need for cognition nor need for affect predicted the use of affect-cognition in book rankings ($ps > .17$). In addition, meta-bases
did not predict the relationship between a participant’s ranking of the book and the book’s character-style quality, \( \beta = -.19, t (42) = -1.20, p = .24 \). Importantly, the impact of meta-bases on the use of a book’s affect-cognition quality remained significant when controlling for all other predictors and for the use of the book’s character-style quality, \( \beta = .42, t (38) = 2.81, p = .01 \).

**Discussion**

Results from Study 1 provide initial evidence for meta-bases as distinguishable from structural bases. The findings also establish meta-bases as non-redundant with need for cognition (NC) and need for affect (NA). That is, the more affective one’s meta-bases, the more positive the relationship between a book’s affect-cognition quality and the book’s ranking. In addition, when considered as separate predictors, neither NC nor NA predicted the use of affect-cognition quality in determining preferences. However, a relative need for affect index that is computed from the subtraction of individuals’ standardized NC scores from their standardized NA scores did predict the use of affect-cognition quality in book rankings (see footnote 4). In fact, this relative need for affect index is correlated with meta-bases (see Table 1). This is consistent with the possibility that a potential origin of meta-bases is individuals’ perception of the extent to which they enjoy emotionally-arousing events and mentally challenging activities. More importantly, despite the relationship between meta-bases and relative need for affect versus cognition,
meta-bases uniquely predicted reliance on a book’s affect-cognition quality in preference for the book after controlling for the latter predictor. In Study 2, I will again examine the utility of meta-bases in information seeking using a different dependent measure.
CHAPTER 3

STUDY 2

The key goal was to replicate Study 1’s findings using a different operationalization of information interest. As an initial attempt to examine the relationship between meta-bases and information interest, participants in Study 1 were primed to attend to an object’s affect-cognition quality rather than irrelevant features, as they read verbal excerpts that differed only on the affect-cognition dimension before they looked at the information grid. Therefore, one could argue that conditions were optimal for meta-bases to predict information interest. In Study 2, I used a more subtle measure of information interest by assessing the amount of time an individual spends looking at the information with greater time assumed to indicate more interest (e.g. see Pomerantz, Chaiken & Tordesillas, 1995).

Another way in which Study 2 differed from Study 1 was the order in which participants completed the measures. In Study 1, participants completed the meta-bases immediately before they completed the information interest measure but in Study 2, participants completed the meta-bases measure some time after they completed the information interest measure. This is to ensure that meta-bases’ unique ability to predict
information interest was not limited to when meta-bases had just been made salient or when meta-bases were more temporarily accessible than the other related constructs of NC and NA.

Method

Participants and Overview of Procedure

Fifty-nine introductory psychology students at Ohio State University completed the study in return for partial course credit. As before, participants were told that that they would be completing various studies. The explicit purpose of the first study was to examine how people made decisions. In this study, participants read an affective and a cognitive message against smoking. The second study ostensibly assessed personality. Participants completed the need for cognition, and need for affect scales. The order in which the scales were presented was counterbalanced across participants. In what was described as a separate study assessing attitudes, participants indicated their structural and meta-bases toward five different attitude objects, one object at a time. Finally, participants were debriefed and thanked.

Dependent Measure: Information Interest

Participants were told that the first study’s purpose was to examine how people make decisions. They were then presented with an affective anti-smoking message and a cognitive version. Each message contained two paragraphs of information and an image.
The affective message was about a smoker who lied to get money for his cigarettes and underwent a laryngectomy, and was accompanied by an image that focused on the throat of a person who had undergone laryngectomy. The cognitive message discussed the addictive feature of tobacco and consequences of smoking such as various cancers. This information was followed by a graph showing the smoking status of male and female adults. Appendix B contains the messages. To assess participants’ selective interest in affective versus cognitive information, we measured the proportion of time each participant spent reading the affective message to the total amount of time spent on reading both the affective and cognitive messages, thus controlling for individual reading speed.

**Predictor Variables**

*Need for cognition and need for affect.* After reading the messages, participants completed an ostensible personality survey in which they completed the NC scale (Cacioppo et. al., 1984) and the NA scale (Maio & Esses, 2001). Scores ranged from 25 to 87 and the median score was 63 for the NC scale ($\alpha = .89$). For the NA scale, which was computed from the difference between the motivation to approach emotions subscale ($\alpha = .87$) and the motivation to avoid emotions subscale ($\alpha = .88$) as before, scores ranged from -52 to 72 and the median score was 16.
Structural bases. After completing the various scales above, participants were told that a separate study aimed to examine their opinions as a way of assessing personality. Participants’ structural bases were measured in the same way as in Study 1 with the same five attitude objects.

Meta-bases. Participants reported their meta-bases in the same way at Study 1 toward the same five attitude objects.

Results

Relationships Among the Predictors

As in Study 1, participants’ meta-bases did not correlate with their structural bases, $r (56) = .11, p = .41$, thus suggesting the meta-bases were independent of structural bases. Unlike in Study 1, meta-bases were not related to need for affect (NA), $r (57) = -.05, p = .72$ and were marginally related to need for cognition (NC), $r (57) = -.22, p = .10$. Unlike Study 1, meta-bases were not correlated with relative need for affect versus cognition. Table 2 contains all correlations among the predictor variables.

Information Interest

In the first regression analysis, meta-bases were included as the only predictor of the proportion of time participants spent on the affective message. Results showed that the more affective one’s meta-bases, the greater the extent to which one spent more time reading the affective information relative to the cognitive information, $\beta = .29, t (57) = \ldots$
Then, separate regression analyses were conducted with structural bases, NA, and NC as predictors, respectively. None of these variables predicted proportion of reading time for the affective message (all \( p > .30 \)). A final regression analysis was conducted with all the predictors entered. The analysis revealed that only meta-bases predicted the proportion of time spent on the affective message, \( \beta = .37, t(52) = 2.75, p = .01 \). In other words, meta-bases’ ability to predict information remained significant even after controlling for all the other predictors.

Discussion

The results of Study 2 showed that meta-bases predicted relative information interest that was manifest as actual behavior – proportion of time spent reading affective information. Although meta-bases were modestly correlated with NA (positively so) and NC (negatively so) in Study 1, meta-bases were not related to NA and were only marginally related to NC in Study 2. This suggests that people’s perceptions of their attitudinal bases do not overlap strongly with their intrinsic interest in cognitive challenges or with their motivation for emotionally-arousing events. As in Study 1, neither NA nor NC predicted participants’ information interest. This was despite the fact that participants completed the NA and NC scales immediately after the reading time assessment.
As in Study 1, meta-bases were not correlated with structural bases. Furthermore, meta-bases but not structural bases mattered in the prediction of selective reading time for the affective message. Thus, in addition to Study 1’s findings, Study 2’s results suggest that structural bases do not impact selective interest in information. The null findings for structural bases are unlikely due to a lack of sensitivity of the measure, as the structural bases measure is very similar to the meta-bases index and the former has proven useful in prior research on persuasion (Huskinson & Haddock, 2004). Rather, it is likely that selective interest as operationalized in the studies so far is a deliberative behavior. Still, to rule out the alternative explanation that the structural bases measure I have used so far is less sensitive than the meta-bases measure, I wanted to compare meta-bases and structural bases in their influence on a phenomenon that previous research has clearly established to be impacted by structural bases. In particular, past research has shown that attitudes are influenced by the interaction between structural bases and the nature of a persuasive message (e.g., Fabrigar & Petty, 1999; Huskinson & Haddock, 2004). Thus, Study 3 was designed to assess the separate influences of meta-bases and structural bases on attitude change as a function of whether the persuasive communication contains affective or cognitive information.

Based on past research, I expected structural bases to have an impact in this instance. The question was whether meta-bases would also predict attitude change and
would do so above and beyond structural bases. As discussed earlier, research on attitudes has demonstrated that explicit measures can *uniquely* predict the same behavior that is already predicted by implicit measures. As I proposed, meta-bases could be especially impactful when the behavior comprises deliberative processes. To the extent that processing a message also involves high-elaboration (e.g., thoughtful consideration of the nature and strength of information) processes, I expect meta-bases to predict attitude change as a function of the appeal type.
CHAPTER 4

STUDY 3

The primary goal of Study 3 was to compare the unique contributions of meta-bases and structural bases in predicting attitude change to affective versus cognitive persuasive messages. I expected that as in past research, structural bases would interact with the type of persuasion to influence attitude change. What about meta-bases? There are plausible conceptual rationales for expecting meta-bases to influence persuasion processes. For instance, among the common mechanisms by which variables produce persuasion (e.g., Petty & Cacioppo, 1986), a few seem to be likely candidates to explain the impact of meta-bases. First, people with a particular meta-basis might see information of that type as more diagnostic and thus, be positively biased in elaborating persuasive messages that match the perceived basis of their attitude, resulting in more favorable post-message attitudes. Alternatively, matching a message to meta-bases could result in greater motivation to elaborate upon the message under conditions where background factors are such that people are neither constrained to be very high or low in their elaboration. Yet another possibility is that people with a particular meta-basis might be more confident in the thoughts that they generate in response to a message that
matches their meta-basis, such that they are more willing to use their thoughts in forming their attitudes. Thus, given a convincing message, matching the message type to an individual’s meta-bases would lead to greater persuasion than mismatching the two variables. Importantly, all of these effects could occur independent of differences in structural bases. The separate mechanisms by which meta-bases and structural bases impact persuasion will be considered further following Study 3. The main goal in Study 3 was to investigate the unique impact of meta-bases on attitude change as a function of message type. First, participants’ meta- and structural bases were assessed as in Studies 1 and 2. Participants were then presented with either an affective or a cognitive message in favor of blood donation before reporting their attitudes toward this topic. Since need for cognition (NC) and need for affect (NA) were uncorrelated with structural bases and did not account for any of the effects of meta-bases in Studies 1 and 2, I did not include NC or NA in Study 3.

Method

Participants

One hundred and forty-five introductory psychology students at the Ohio State University participated in the study in return for partial course credit.
Procedure

Participants were told that they would be completing various studies in order to fulfill the credit requirement. The first study was presumed to be a survey that assessed students’ opinions toward various attitude objects. During this phase, both the structural and meta-bases of participants’ attitudes were assessed. The second study was said to be about students’ opinions toward social issues that were presumed to be randomly selected. During this phase of the study, participants first read a distracter message and then read the target message regarding blood donation. After participants completed the dependent measures, they were debriefed and thanked for their participation.

Independent Variables

Structural bases. Participants’ structural bases were assessed in the same way as in Studies 1 and 2. The four attitude objects were birth control, capital punishment, George W. Bush, and spiders. These were aggregated as described previously to create an index of structural bases.

Meta-bases. Participants’ meta-bases were assessed in the same way as in the earlier studies. That is, participants indicated the extent to which their attitudes were driven by affect and by cognition for each of the four attitude objects. These were aggregated across the four objects to create an index of meta-bases.
Message type. After reading a distracter message (concerning capital punishment), participants read either an affective message or a cognitive message in favor of blood donation. The affective message focused on positive emotions such as the good feelings associated with blood donation. For instance, the message mentioned the joy and excitement people experience when donating blood. The cognitive message was designed to elicit positive thoughts about donating blood. For example, the message discussed the various ways in which donated blood can be used. Appendix C contains the messages.

Dependent Measure: Attitude Change

Before reading the message, participants reported their attitudes toward blood donation using semantic-differentials with the following anchors: negative-positive, undesirable-desirable, negative-good, and dislike-like. Then, after reading the blood donation message, participants reported their attitudes toward blood donation again using the same items. An index of attitude change was created by subtracting the average of participants’ post-message attitudinal responses from the average of their pre-message responses.

Results

As before, participants’ meta-bases did not correlate with their structural bases, r (143) = -.03, p = .71. The primary analysis was a hierarchical regression in which all
main effects were entered, then the two-way Structural Base X Message Type and Meta-
Base X Message Type interactions (see Cohen & Cohen, 1983). Results showed that
neither message type nor structural bases on its own predicted attitude change, $\beta = .02$, $t$
(141) = .18, $p = .86$, and $\beta = -.10$, $t$ (141) = -1.21, $p = .23$, respectively. There was a
marginally significant tendency such that meta-bases were related to attitude change, $\beta =$
-.15, $t$ (141) = -1.73, $p = .09$. That is, people with cognitive meta-bases tended to show
more attitude change than those with affective meta-bases. Of more relevance, the past
finding that structural bases interact with message type to influence attitudes was
replicated as there was a significant Structural Base X Message Type interaction, $\beta = .17$,
t (139) = 2.08, $p = .04$. That is, the type of message was differentially effective as a
function of individuals’ structural bases. The top panel in Figure 1 shows a relative
persuasion matching effect such that individuals with primarily affective structural bases
tended to be more influenced by the affective than the cognitive message. However, as
structural bases became more cognitive, the advantage of the affective message
disappeared and, in fact, the cognitive message tended to be more impactful.

Crucial to the current hypothesis is the Meta-Base X Message Type interaction, $\beta$
= .16, $t$ (139) = 1.98, $p = .05$, which remained significant even when controlling for the
Structural X Message Type interaction. That is, the nature of the message differentially
influenced attitudes as a function of individuals’ meta-bases. As shown in the bottom
panel of Figure 1, there again was a relative persuasion matching effect such that affective meta-base individuals tended to be more persuaded by the affective than the cognitive appeal. The advantage of the affective message was gone for individuals with cognitive meta-bases. Instead, the cognitive message tended to be more effective for these individuals.$^{11}$

Discussion

Results from Study 3 suggest that both meta-bases and structural bases interacted with message type to produce a matching effect on persuasion. That is, individuals with cognitive meta- and structural bases were more persuaded by the cognitive message than the affective message, whereas the opposite was true for individuals with affective meta- and structural bases—they were more persuaded by the affective than the cognitive messages. The fact that meta-bases and structural bases accounted for separate amounts of variance provides support for the hypothesis that it is important to consider meta-bases in addition to structural bases when examining attitude change to affective versus cognitive communications. In fact, the interaction between meta-bases and message type was equivalent in effect size to the interaction between structural bases and message type. This suggests that meta-bases play at least an equally important role as structural bases in accounting for affective-cognitive matching effects.
These findings imply that given a message, people’s structural bases may guide their inclination to actually rely on emotions or beliefs in attitudes such that they are more persuaded by the message that matches their structural bases. At the same time, the same matching effect occurs for people’s meta-bases independently of their structural bases. As I proposed, meta-bases and structural bases could be impactful under conditions that promote deliberative and spontaneous responses, respectively. Since participants in Study 3 were not constrained to engage in minimal effort or a lot of effort in their attitude change, deliberative and spontaneous processes such as considering the merits of the information and automatically attending to the information could be involved. On the other hand, I suggested that participant in Studies 1 and 2 were likely to be deliberative in their selection of affective or cognitive information in making book selections. There was sufficient time to be deliberative as people read the affective and cognitive information at their own pace. Furthermore, the novelty of the ranking task likely further fostered a deliberative orientation. However, to more directly test the hypothesis that meta-bases are more impactful when people respond thoughtfully, whereas structural bases are more influential when people respond spontaneously, I conducted Study 4, which examined the differential impact of meta- versus structural bases when a ranking task was completely novel, and thus responded to deliberatively, or familiar leading to more spontaneous reactions.
CHAPTER 5

STUDY 4

So far, I have obtained findings that meta-bases but not structural bases are influential in people’s reliance on affective versus cognitive information in determining preferences and in people’s selectivity in the amount of time they spend reading affective or cognitive information. I have also found that both meta-bases and structural bases could be independently influential in persuasion as a function of the type of appeal. Taken together, these findings imply that meta-bases are a separate construct from structural bases. The current study aims to examine a potential moderator of when meta-versus structural bases might be influential – deliberativeness.

As I have explained previously, meta-bases reflect metacognitive judgments about one’s attitudinal bases. Previous research suggests that general metacognitive judgments are more likely to occur and be influential when participants engage in much rather than little thinking (see Petty et. al., 2007). In other words, it is possible that when people are deliberating carefully about the information they are about to use in their decisions, they not only consider the information they are faced with, but they also think about whether they typically base their attitudes more on affect or on cognition and use such
metacognitive judgments to guide their reactions to the information. Therefore, I expect meta-bases, like other metacognitive judgments, to be more impactful when people are responding deliberatively.

On the other hand, prior research has conceptualized structural bases as tapping into existing associations among people’s affect, cognition and overall evaluation toward various attitude objects. That is, just as an attitude reflects the association between an object and its stored evaluation in memory (Fazio, 1995), a structural basis represents the associations among an evaluation, its affective components and its cognitive components in memory. When cognitive components are more strongly linked than emotional components to the object and its evaluation, the attitude is viewed as having a cognitive structural base. On the other hand, when emotions are more strongly associated with the object and its evaluation in memory, the attitude is considered to have an affective structural base. In past research, structural bases were indicated by the extent to which a component was evaluatively consistent with the target attitude (e.g., Crites et. al., 1994, Eagly et. al., 1994, Huskinson & Haddock, 2004). In other words, the positivity of the component is compared with the overall attitudinal valence. Presumably, the more similar the component is to the attitude with respect to its valence, the more strongly linked the component is to the target evaluation in memory. Evidence for the notion that structural bases are linked to the target object in memory is provided by research on differences in
accessibility of affective versus cognitive components as a function of whether the attitude is affect- or cognition-based. In particular, Giner-Sorolla (2004) showed that relative to cognition-based objects, affect-based objects elicited quicker response times to associated emotional adjectives than cognitive adjectives. That is, participants were faster in completing the affective stem “a (insert target object) makes me feel ___” than the cognitive stem “a (insert target object) is something ___” with provided adjectives when the target object is affect-based. Therefore, similar to automatically activated attitudes, which have been posited to be especially influential for spontaneous behaviors (e.g., Fazio & Towles-Schwen, 1999), I expect that structural bases, which represent relative accessibility of affective or cognitive bases, might also be more impactful when people are responding spontaneously.

As an initial test of the hypothesis that the deliberativeness with which people are responding moderates the impact of meta- versus structural bases, I returned to using the ranking task in Study 1, for which effects of structural bases were not obtained. In this task, participants were given information about various qualities of the target object before they rank the objects. In the current study, participants actually completed two different ranking tasks – one for fiction books and another for video clips that were described as supplementary materials for the introductory psychology course. The first ranking task presumably replicates the conditions of Study 1. Since the ranking task is
unfamiliar, participants are expected to be relatively deliberative in responding to it. Once participants get to the second ranking task, however, the ranking procedure is more familiar. Due to practice and experience with the first ranking task, participants were expected to respond more spontaneously to the second ranking task.¹²

For Study 4, I hypothesize that when participants complete the first ranking task, for which they are deliberative in their responses, meta-bases would be more important in predicting the extent to which they rely on an object’s affective versus cognitive qualities in their preference for the object. However, when participants complete the second ranking task, for which they are quicker and more spontaneous in their responses, structural bases would be more impactful on their use of an object’s affect-cognition nature to determine their preference for the object.

**Method**

**Participants**

Sixty-four introductory psychology students at the Ohio State University participated in the study in return for partial course credit.

**Procedure**

Participants were told that they would be completing various studies in order to fulfill the credit requirement. In the first study, participants were told that the study’s purpose was to examine how people make decisions about fiction books and video clips.
that served as supplementary materials for the introductory psychology course.

Participants received information about the various dimensions of each target object before they ranked the objects. Each participant completed two ranking tasks – first for fictions books and then for video clips. Participants then completed a Stroop test as the filler task. Finally, in an ostensibly separate study, participants reported their structural bases and meta-bases before they were debriefed and thanked for their participation.

*Information Interest Tasks*

*Information interest in the first (deliberative) ranking task.* The first task that participants completed in the experiment was the ranking task for fiction books. Unlike in Study 1, participants were not presented with fictitious excerpts. In other words, they were not primed to attend to affective or cognitive qualities in this study. Instead, they received only an information grid that contained ratings presumably from last quarter’s students. This information grid was similar to the one used in Study 1 and contained ratings of the extent to which each book stimulated thinking, had good character development, elicited emotions, and had good plot development. Participants then ranked the books according to their interest in reading them. I expected participants to be deliberative in their ranking of books as this was their first exposure to such a task.

*Information interest in the second (spontaneous) ranking task.* After the book ranking task, participants received a similar information grid for the introductory
psychology video clips. The grid contained ratings that were presumably from last quarter’s students on the extent to which each clip had good audiovisual quality, were emotionally provoking, were of appropriate length, and were thought-provoking. Participants then ranked the video clips. They were expected to be less deliberative in their ranking of these clips because they had just completed a similar task and should be familiar with the task. Indeed, participants took about half the time to rank the video clips ($M = 6.82s, SD = 1.55s$) as they did to rank the books ($M = 12.97s, SD = 7.19s$), $t (61) = 6.93, p < .001$. Appendix D contains the information grids and ranking instructions for the books and clips.

Independent Variables

Structural bases. Participants’ structural bases were assessed in the same way as in the prior studies. These were aggregated across the same five attitude objects in Studies 1 and 2 as described previously to create an index of structural bases.

Meta-bases. Participants’ meta-bases were also assessed in the same way as in the earlier studies. That is, participants indicated the extent to which their attitudes were driven by affect and by cognition for each of the five attitude objects. These were aggregated across the five objects to create an index of meta-bases.
Results

Relationship Between Meta-bases and Structural Bases

In this study, meta-bases and structural bases were moderately correlated with each other, \( r (62) = .29, p < .05 \), such that more affective meta-bases were associated with more affective structural bases.

Information Interest in the First (Deliberative) Ranking Task

As in Study 1, two Spearman rank-order correlations were computed for each participant. One correlation was between the participant’s book ranking and the book’s affect-cognition quality, and reflects the extent to which the participant attends to the book’s affect-cognition quality and uses the dimension to determine overall preference for the book. Another correlation was between a participant’s book ranking and the book’s character-plot quality, and reflects the extent to which the participant uses the book’s character-plot quality to determine his or her preference for the book.

As expected for when participants were relatively deliberative in their responses, when individuals’ meta-bases were entered as the only predictor in the model, they predicted the relationship between a participant’s ranking of a book and the book’s affect-cognition quality, such that the more affective one’s meta-bases, the greater the use of a book’s affect-cognition qualities to determine overall preferences, \( \beta = .29, t (63) = 2.35, p < .05 \). On the other hand, when structural bases were entered as the only predictor,
they did not predict the use of affect-cognition qualities to determine preference, \( \beta = .14, t (63) = 1.10, p = .28 \). Importantly, in the regression analysis in which meta-bases and structural bases were entered simultaneously as predictors for the use of the affect-cognition quality in book ranking (the first task) and the use of the irrelevant dimension was entered as a co-variate, meta-bases accounted for a significant amount of variance, \( \beta = .26, t (60) = 2.05, p = .045 \) but structural bases did not, \( \beta = .05, t (60) = .40, p = .69 \). Furthermore, meta-bases did not predict the relationship between a participant’s ranking of a book and the book’s character-plot quality, \( \beta = -.04, t (63) = -.31, p = .75 \). This was expected as a book’s character-plot quality was a dimension that might be important in book preferences but not relevant to perceptions of whether one relied on affective or cognitive bases. Similarly, structural bases also did not predict the use of a book’s character-plot quality in preferences, \( \beta = -.04, t (63) = -.31, p = .75 \).

*Information Interest in the Second (Spontaneous) Ranking Task*

As with the ranking task above, two Spearman rank-order correlations were computed for each participant. One correlation was between the participant’s clip ranking and the clip’s affect-cognition quality. Another correlation was between a participant’s clip ranking and the clip’s AV-length quality, and reflects the extent to which the participant uses the clip’s AV-length quality to determine his or her preference for the clip.
As expected for when participants were relatively spontaneous in their responses, when individuals’ structural bases were entered as the only predictor in the model, they predicted the relationship between a participant’s ranking of a clip and the clip’s affect-cognition quality, such that the more affective one’s structural bases, the greater the relationship, $\beta = .41$, $t (63) = 3.49$, $p = .001$. Unexpectedly, meta-bases also predicted reliance on a clip’s affect-cognition quality to form preferences for the second task, such that more affective meta-bases were associated with greater reliance on affect-cognition qualities, $\beta = .25$, $t (63) = 2.06$, $p < .05$. Importantly, however, when meta-bases and structural bases were entered simultaneously as predictors and the use of the irrelevant dimension was entered as a co-variate, meta-bases did not account for any variance, $\beta = .13$, $t (60) = 1.10$, $p = .28$, but structural bases did predict the relationship between preference for the clip and the clip’s affect-cognition quality, $\beta = .34$, $t (60) = 2.85$, $p = .01$. This suggests that meta-bases were predictive of the use of affect-cognition qualities to form preferences only to the extent that they co-varied with structural bases whereas structural bases reliably predicted the use of a clip’s affect-cognition quality to form preferences. As for the use of the irrelevant dimension – the clip’s audiovisual-length quality, neither structural bases nor meta-bases accounted for any variance in the relationship between a participant’s clip ranking and the clip’s audiovisual-length quality, $\beta = .08$, $t (63) = .60$, $p = .55$, and $\beta = .11$, $t (63) = .89$, $p = .38$, respectively.
Discussion

Results from Study 4 suggest that when participants were forming their preferences thoughtfully, their meta-bases impacted their information interest such that individuals with relatively affective meta-bases relied on an object’s affective qualities more than its cognitive qualities to determine their overall preference to a greater extent than individuals with cognitive meta-bases. However, individuals’ structural bases did not predict the use of an object’s affect-cognition quality to determine preferences. These findings replicate those in Study 1 even though in the current study, participants were not primed to attend to information about an object’s affective and cognitive qualities prior to receiving the information grid. Of more interest, the results from Study 4 showed that when participants were more spontaneous in their responses, as suggested by the shorter time they took to complete the second rankings, it was structural bases that predicted participants’ reliance on an object’s affect-cognition quality to determine preferences. In other words, individuals with affective structural bases used an object’s affective qualities to determine their preference more than individuals with cognitive structural bases.

Overall, the findings from Study 4 provide some support for the hypothesis that meta-bases are more important in determining information use when an individual is engaging in the behavior deliberatively whereas structural bases are more influential when the individual is responding more spontaneously. It is worth noting that evidence
for such differential impact was obtained despite a moderate correlation between meta-
bases and structural bases, thus suggesting that even when individuals have some insight
into whether their attitudinal bases are dominated by affect or cognition, their perceptions
of their attitudinal bases are still separate from their actual attitudinal bases in the ability
to predict information interest.
CHAPTER 6

GENERAL DISCUSSION

The major goal of the current research was to introduce the construct of affective versus cognitive meta-bases as distinct from affective versus cognitive structural bases. The latter concept has achieved considerable prior attention in the literature on attitudes and persuasion, but the former is completely new. Meta-bases refer to subjective impressions of whether one’s attitudes are primarily driven by affect or cognition and are conceptually distinguishable from structural bases, which refer to whether one’s judgments are structurally based on affect or cognition. The present research provided empirical evidence to support such a distinction. Study 1 showed that meta-bases predicted reliance on explicitly affective or cognitive information to guide attitudes. In comparison, structural bases, need for affect and need for cognition did not predict such information interest. Study 2 replicated the unique ability of meta-bases to predict information interest as manifest in actual behavior – proportion of time spent reading affective versus cognitive information. Study 3 demonstrated that meta-bases interact with the type of message to influence persuasion, and that such effects are independent of the effects of structural bases. Taken together, these three studies establish that meta-
bases uniquely predict attitude-related phenomena such as interest in information that is expected to be used in forming evaluations as well as persuasion as a function of message type. Moreover, the findings from Study 4 suggest that while structural bases are more impactful when people are spontaneous in their responses, meta-bases exert their influence especially when the people are responding deliberatively.

Assessing Meta-bases

In order to compare meta-bases with structural bases that were assessed as an individual difference, we examined meta-bases as varying across individuals. As mentioned earlier, I expected that, like other types of metacognitive judgments, meta-bases can exist as stable individual differences. The present research supports this idea by showing the impact of chronic meta-bases that are assessed with respect to one’s perceptions regarding specific attitude objects. As with structural bases, which could vary as a function of the attitude object in question, meta-bases might vary across objects too. For instance, people may chronically perceive affective bases for their attitudes toward objects for which feelings are viewed as more pertinent than thoughts (e.g. one’s relationship partner) but cognitive bases for evaluations of objects for which thoughts are considered more relevant (e.g. job applicants). Nevertheless, the current research indicates that there is sufficient uniformity across attitude objects within individuals such
that an individual difference index of meta-bases predicts responses across a wide variety of attitude objects (e.g., books, smoking, and blood donation).

Although the current studies have shown that it is useful to consider meta-bases as an individual difference, it is also likely fruitful to consider meta-bases at the object-specific level. In this regard, one potentially interesting type of object to examine is social groups. In prior research, participants’ attitudes toward men, women, and Democrats were predicted by their emotions but not their beliefs regarding these groups (Eagly et. al., 1994). In other research, Canadian participants’ judgments of Native Indians and French Canadians were predicted by emotions but not beliefs associated with the group, but for Pakistanis and homosexuals it was the opposite (Esses et. al., 1993).

The current research suggests that in addition to the structural bases of prejudice toward specific social groups, it might be useful to also consider the meta-bases of prejudice toward that group, because matching the affect-cognition nature of a message about a prejudiced group to the meta-bases of that prejudice could be more effective in reducing prejudice than mismatching the two. For example, future research can assess whether Blacks are perceived to be a social group that elicits affectively-based or cognitively-based prejudice and whether prejudice can be reduced by presenting a message that matches the meta-basis of attitudes toward Blacks in addition to the structural basis of attitudes toward Blacks.
In the current research, meta-bases were always measured rather than manipulated. One limitation of measuring rather than manipulating meta-bases is the issue of confounding variables. The current research examined the two most likely confound candidates—need for cognition and need for affect. However, to rule out other possible confounding variables, it will be important for future research to examine the impact of meta-bases by attempting a manipulation of meta-bases. One potential manipulation is to vary the salience of base-relevant behaviors, for instance by systematically varying the self-reported frequency of instances in which one relied on affect in one’s decisions versus those in which one relied on cognition (e.g., Salancik & Conway, 1975). In this manipulation, participants should be more likely to agree with the statement that they occasionally feel delighted to donate blood than the statement that they frequently feel delighted to donate blood. When instances of relying on affect are paired with moderate rather than extreme frequency and instances of relying on cognition are paired with extreme rather than moderate frequency, people should be more likely to perceive themselves to rely on affect. If a temporary change in meta-bases has the same impact as the more chronic meta-bases studied in the current work, concern about confounding variables would be attenuated.
Deliberativeness as a Moderator

In addition to demonstrating meta-bases as unrelated to structural bases, the current research establishes the importance of meta-bases in their unique consequences for information interest and persuasion. One question that arises is under what conditions meta-bases versus structural bases will predict behavior. I propose that in Studies 1 and 2, the behaviors of interest – relying on a book’s explicit affect-cognition quality to determine preference for the book and reading preferred information at one’s own pace – are likely to be ones that participants engaged in with some deliberation. Furthermore, in these studies, the affective versus cognitive nature of the information was rather explicit, further encouraging the more deliberative focus on these dimensions. In Study 3, attitude change was likely to have comprised both deliberative and spontaneous elements such as carefully considering the nature and merits of the message and experiencing ease of processing such information, respectively. Indeed, Study 4 provides some initial evidence that when people are primarily deliberative in their responses, meta-bases are more impactful in one’s reliance on an object’s affect-cognition quality in forming preferences but when people are responding more spontaneously, structural bases are more influential. The hypothesis that meta-bases matter more when people are deliberative is consistent with prior research on other types of meta-cognitive judgments, such as using the perceived validity of one’s thoughts. In past research, the perceived validity of one’s
thoughts is more likely to affect judgments under high than low thinking conditions (e.g., Petty et. al., 2002). In addition, the hypothesis that structural bases are more impactful in attitudes and related phenomena when people respond spontaneously is consistent with the conceptualization of automatically activated attitudes, which have been proposed to be especially influential for spontaneous behaviors (e.g., Fazio & Towles-Schwen, 1999).

In Study 4, the hypothesis that deliberativeness would moderate the impact of meta-bases versus structural bases was tested explicitly by examining the same behavior (i.e. use of an object’s explicit affect-cognition quality to determine overall preference) in judgments that were made deliberatively or more spontaneously. One potential future direction is to examine the differential influence of meta-bases versus structural bases on different behaviors that tend to be deliberative or spontaneous. For instance, one could examine whether certain deliberative behaviors such as the effortful retrieval of information are more impacted by meta-bases than structural bases whereas certain spontaneous behaviors such as automatic attention (e.g., Roskos-Ewoldsen & Fazio, 1992) are more influenced by structural bases than meta-bases. Findings from such research could shed light on the underlying mechanisms through which meta-bases and structural bases influence behaviors such as attitude change.
Underlying Mechanisms for the Impact of Meta-bases and Structural Bases

Besides differences between meta-bases and structural bases in when one is more likely to be impactful than the other, there should exist differences between the two constructs in how they would be impactful. For example, how do meta-bases increase persuasion in the case of matched appeals? As discussed in Study 3’s introduction, the extent to which people elaborate upon the information in a message varies considerably in persuasion situations (e.g., Petty & Cacioppo, 1986). One particularly interesting condition that might allow for the distinction between the underlying mechanisms of meta-bases and structural bases in attitude change is when people are not constrained to be low or high in their elaboration. When the tendency to elaborate is moderate, meta-bases might influence people to increase their overall processing of the matched appeal such that the merits of the matched appeal are recognized to a greater extent than those of the mismatched appeal. Importantly, it is possible that meta-bases are influencing the amount of scrutiny given to the appeal by impacting the motivation to process and distinguish between affective and cognitive information rather than the ability to do so. In fact, past research on other metacognitive judgments suggests that such judgments impact motivation-dependent behavior rather than ability-dependent behavior. For example, consider research on the Social Judgeability Model (e.g., Yzerbyt, Schadron, Leyens, & Rocher, 1994). Yzerbyt and colleagues found that relative to control participants,
individuals who believed they had unconsciously received individuating information were more likely to rely on stereotypes in their judgments, even though they actually did not receive any such information. Since participants were randomly assigned to the meta-information or control condition, knowledge of stereotypes should be evenly distributed across both groups. Thus, it is unlikely that participants in the meta-information condition made more stereotypical judgments because they had more knowledge of stereotypes. Rather, they were more willing to use stereotypes because the perception that they had received individuating information encouraged them to believe their judgments were legitimate.

What about structural bases? How might they influence attitude change? Given that structural bases represent existing associations among affect, cognition and attitudes in one’s memory (e.g., Giner-Sorolla, 2004), it is likely that such associations influence one’s ability to be selectively process affective or cognition information. For example, an individual with affective structural bases might be able to automatically attend to and/or to retrieve more affective information than cognitive information even when given equal opportunity to process both types of information. As mentioned, when people are not constrained in their elaboration likelihood, matching the message to their meta-bases might increase their overall scrutiny of the message. Similarly, matching the message to people’s structural bases might also increase their overall processing of the message.
However, while meta-bases might increase overall processing of the matched message by impacting the motivation for processing, for instance by encouraging the perception that the matched information is more personally relevant, structural bases might increase overall scrutiny of the matched appeal by influencing the ability to comprehend and remember the matched information relative to the mismatched information. Further research can assess this hypothesis by examining the extent to which additional motivation-related factors (e.g., perceived importance) and ability-related factors (e.g., automatic attention) serve as potential mechanisms for message-matched persuasion.

**Origins of Meta-bases**

Besides differing in their consequences, meta-bases and structural bases might also differ in their origins. As demonstrated in prior research on the structural bases of attitudes, people can base their attitudes on affect or on cognition as a function of what knowledge they actually possess about the object. For example, participants who read information designed to elicit emotions toward a fictitious animal (a lemphur) formed more affectively-based attitudes, whereas participants who read information about the characteristics of the animal such as its intelligence and its usefulness developed more cognitively-based attitudes (Fabrigar & Petty, 1999). In addition, some have argued that even when given both affective and cognitive information, the information that is presented first is the information upon which an attitude is structurally based (e.g.,
Edwards, 1990). What about perceptions of attitudinal bases? If meta-bases are not derived from structural bases, where do they come from?

First, it is possible that meta-bases stem in part from individual differences in need for affect and need for cognition. In other words, perceptions of reliance on affective bases may arise from perceptions that one is attracted to affectively arousing experiences, and perceptions of reliance on cognitive bases may arise from perceptions that one enjoys cognitive challenges. In fact, meta-bases may develop from perceptions regarding one’s interest in affective and cognitive information in general. That is, people who think they like to process affective information regardless of whether the information is arousing or complex may also perceive that they like to use such information to make decisions. Similarly, people who perceive themselves to enjoy processing cognitive information in general may also think that they rely on cognitive information in forming their attitudes. Finally, although the current research focuses on the conceptualization of meta-bases as perceptions regarding affective versus cognitive bases for one’s attitudes, it is possible that this conceptualization could be broadened to include perceptions about bases for one’s behavior. In fact, perceived attitudinal bases may develop from perceptions of behavioral bases, and vice versa.

Given that meta-bases were only moderately correlated with need for affect and need for cognition in the current research, and that the latter two variables did not predict
information interest as accounted for by meta-bases, there must be other factors that contribute to the development of meta-bases. As discussed above, other factors include perceived interest in general affective versus cognitive information as well as perceived bases for one’s behavior. Another approach to addressing this question is to consider differences in people’s perceptions of their ability and motivation to process affective or cognitive information. For instance, people who perceive that they tend to know a lot about emotions might also perceive that they tend to use affect to guide their attitudes but people who think they tend to be well-informed about the characteristics of various issues and objects might also think that they tend to rely on cognition in their attitudes. Furthermore, such perceptions about knowledgeability with regard to affect and cognition may not correspond to actual knowledgeability. Rather, perceptions of affective or cognitive knowledgeability might be influenced by general lay theories such as gender stereotypes. Indeed, prior research that distinguishes perceived performance from actual performance has demonstrated that women tend to view themselves as having low ability in science relative to men (Ehrlinger & Dunning, 2003). Such perceptions, in turn, reduce their interest in participating in a science competition. Applied to meta-bases, women may view themselves as well-informed about emotions to the extent that they perceive themselves to rely on affect more than cognition in attitudes.
People might also perceive that they are differentially motivated to process affective versus cognitive information. Such perceptions include the view that one is intrinsically motivated toward affective or cognitive information, which may arise due to self-attributions regarding such instances. For example, people may perceive greater use of affect in their evaluations because they can retrieve examples of such behavior more easily regardless of whether they actually use affect to guide decisions more often. Much research has established that the subjective accessibility of one’s memories influence one’s self-judgments, for example, regarding one’s assertiveness (e.g. Schwarz et. al., 1991). It is plausible that preference for reliance on affect in one’s evaluations is an additional self-concept that is influenced by such ease of retrieval, regardless of from where the ease stems.

Are Meta-bases Ever Related to Structural Bases?

The lack of a relationship between meta- and structural bases in the first three studies as well as the modest relationship between meta- and structural bases in Study 4 is consistent with research on introspection showing that people may not have accurate access to why they like or dislike something.13 One might ask whether people’s meta-bases would ever correspond to structural bases. To the extent that the lack of relationship between meta- and structural bases is driven by factors such as incomplete access to reasons for attitudes and difficulty in distinguishing between unique
contributions of affect versus cognition, these same factors could be modified to produce correspondence between meta- and structural bases. For example, people should be able to comprehensively access their attitudinal bases under certain conditions, such as when all of these bases are subjectively accessible. In other words, it might be easier for people to accurately detect a greater use of affect if the greater amount of attitude-relevant affective information that occurred to them spontaneously was experienced as easier to retrieve than cognitive information. Whether affective or cognitive information is subjectively accessible may also depend on whether people view the attitude object in question as a consummatory or instrumental object. Millar and Tesser (1986) made the distinction between consummatory and instrumental behaviors. Consummatory behaviors are behaviors that people perform for their own sake (e.g., playing with puzzles) whereas instrumental behaviors are those that people perform to attain a separate goal (e.g., playing with puzzles as a way to practice for an upcoming analytic test). In their research, Millar and Tesser found that when participants viewed playing with puzzles as a consummatory behavior, those who tried to access affective bases for their attitudes reported attitudes that were more predictive of their behavior than others who tried to access cognitive bases. In contrast, when participants viewed playing with puzzles as an instrumental behavior, it was the group that tried to access cognitive bases that reported attitudes that were more predictive of behaviors. Perhaps participants experienced more
ease in retrieving a representative sample of affective bases when they viewed puzzles as consummatory but more ease in retrieving a representative sample of cognitive bases when they viewed puzzles as instrumental.

In addition to identifying a representative set of reasons, people also need to accurately distinguish between the unique contributions of affect and cognition in determining attitudes for their meta-bases to correspond with their structural bases. People may be more likely to recognize the unique contributions of affect and cognition in their judgments in situations where affect and cognition are evaluatively inconsistent. When the components of an attitude are evaluatively consistent and close to one another in extremity, it will be especially hard for people infer a dominant base for their attitudes. However, the task would be easier if the components differ evaluatively. For example, given a positive attitude toward a drug, people should find it relatively easy to infer an affective base for their attitude if the drug produces desirable emotions but is associated with negative beliefs.

*Implications of the Meta-structural Distinction for Other Attitudinal Bases*

The meta-structural distinction might be useful for understanding bases of attitudes beyond affect and cognition. According to past research, attitudes can be based on various functions such as to make sense of the world, fit in with others, and uphold values (see Katz, 1960; Smith, Bruner, & White, 1956). In addition, previous research
has shown that the functional basis of an attitude interacts with message type to influence attitudes such that a message type that matches an attitude’s function tends to produce more persuasion than a message type that does not match an attitude’s function – at least if the arguments presented are strong (Petty & Wegener, 1998). For instance, DeBono (1987) showed that high self-monitors whose attitudes are based on the perceived motivation to fit in with others were more persuaded by arguments presumed to be related to others’ opinions than by arguments framed as value-relevant. The opposite was true for low self-monitors. Given that self-monitoring was always assessed directly, self-monitoring probably taps into meta-attitudinal judgments of social concerns or values as bases for one’s preferences. In other words, high and low self-monitors might be said to differ in their image or value meta-bases. However, it is unclear whether attitudes among high self-monitors are also structurally based on social concerns. For example, a high self-monitor might also have attitudes that are associated with social concerns in memory. Given that the current research demonstrated the equal and independent contributions of meta- and structural bases to persuasion, it could be useful to assess structural functional bases in high and low self-monitors. Differences in structural image- or value bases between high and low self-monitors might explain additional variance in persuasion beyond the variance already accounted for by meta-bases. In addition, such
bases might be especially impactful when people are changing their attitudes spontaneously.

Another example involves attitudes that are based on one’s group membership, especially when one is highly identified with the group. Past research has established that persuasion tends to increase when the source of a cogent message is from the same group as the participant (see Fleming & Petty, 2000, for a review). The current distinction between meta and structural bases suggests that some individuals might perceive their attitudes as driven to a large extent by their group membership or might actually base their attitudes on their social identity. Similar to perceptions of affective or cognitive bases, one’s subjective impressions of group-based attitudes may not completely overlap with the actual structural basis of the attitudes. For instance, an individual might think that he or she is in favor of welfare assistance mainly because he or she is a Democrat. However, the association between the individual’s attitude toward welfare assistance and the individual’s self-concept as a Democrat may be weaker or stronger than expected. It might be fruitful to assess the extent to which one’s attitude is structurally based on one’s identified group membership as well as the extent to which one perceives such a basis in order to examine their distinctive consequences for attitude change. For instance, perceptions of such a basis might impact one’s willingness to process information from an ingroup member (e.g. perceptions that an ingroup source has relevant arguments to
make about welfare assistance) relative to an outgroup member, regardless of how easy or difficult the information is to process, whereas the structural basis might impact one’s ability to remember information from an ingroup member (e.g. comprehension of statements from the ingroup source) compared to an outgroup member, regardless of how relevant the statements are to welfare assistance. Finally, the meta-structural distinction could also be extended to matching effects for additional bases of attitudes such as one’s self-schema (e.g., Wheeler, Petty & Bizer (2005) or one’s regulatory goal (e.g., Aaker & Lee, 2001).

**Conclusion**

The current research provides evidence for the utility of a meta-structural distinction in the affective versus cognitive bases of attitudes. Since past research focused on structural bases, the present studies emphasized the importance of meta-bases by showing the impact of meta-bases on information seeking behaviors that are unaffected by structural bases, and by showing the influence of meta-bases in addition to that of structural bases on attitude change. I believe that the meta-structural distinction might prove to be fruitful with respect to other attitudinal properties. Much of past research in attitudes has focused on structural properties or on metacognitive judgments. Even in research where both structural properties and metacognitive judgments were examined, the two were usually viewed as representing a single underlying construct. Although I
have discussed the application of such a distinction to certain types of attitudinal bases, the distinction may prove useful for understanding additional attitudinal properties such as ambivalence.

Given the established utility of meta-bases, various future directions are possible. First, examination of the consequences of meta-bases and structural bases under different conditions could be useful in identifying when meta-bases versus structural bases are important. Such work could shed light on how meta-bases and structural bases impact attitude change. At the same time, a clearer picture of meta-bases would emerge from examining the origins of meta-bases and its relationship to structural bases. Such issues are interesting to consider because we now know that the mere perception that one bases one’s attitudes primarily on feelings or on beliefs influences whether one is more interested in or persuaded by a message that appeals to emotions versus cognitions.
Footnotes

1 Other terms that overlap with the current conceptualization of “meta-attitudinal” versus “structural,” such as “explicit” versus “implicit,” and “subjective” versus “objective” could have been selected. One reason I prefer the word “meta-attitudinal” to describe people’s perceptions of their attitudinal properties is because the current research was inspired by the question: what happens when people develop metacognitions about their attitudes? Perceptions of one’s attitudinal property can reflect a metacognitive process, which begins with a first-order cognition about one’s attitude (e.g., “I am negative toward smoking”) and then a second-order cognition about that cognition (e.g., “This negativity is based on my beliefs about smoking”). As for the word “structural,” its meaning closely maps onto the conceptualization of properties that exist in association with an attitude in one’s memory.

In addition, as Fazio & Olson (2003) pointed out, the word “implicit” is potentially confusing because it could be interpreted as lacking awareness of one’s reactions or lacking awareness that one’s reaction is being examined. Structural bases tap into affective and cognitive reactions that one is aware of although one may not know which type of reactions are the dominant basis for one’s attitude. As for the words “subjective” and “objective,” they have been used to describe methodological differences
for indices that are designed to tap the same underlying construct, which is precisely what the current research is trying to discourage.

2 In Zanna & Rempel’s tripartite model, attitudes are also posited to be based on behavioral factors. However we do not discuss the behavioral base as it is not relevant to the current research.

3 Conceptually, I argue that even preferences that distinguish between affective and cognitive bases to a small extent should matter, though greater relative preferences should matter more. In addition, there are several practical reasons for treating meta- and structural bases as discrepancies between affective and cognitive bases. First, the difference score addresses individual differences in response bias for people who just tend to say they use all types of information in their attitudes. Second, from a statistical standpoint, the difference score is more powerful because it leads to a simpler model with more degrees of freedom. Finally, using the difference score avoids the problem of multicollinearity, which renders regression analyses problematic. In fact, in the current research, affective and cognitive meta-bases tend to be correlated (.33 < rs < .57).

Certainly, there are disadvantages to using discrepancy scores (e.g., see Peter, Churchill Jr., & Brown, 1993). One issue is that discrepancy scores may be unreliable, thus undermining the tendency for them to correlate with another variable. However, this feature of discrepancy scores actually makes it harder to obtain evidence of meta-bases’
predictive utility. Another issue is that the relationship between a discrepancy score and another variable of interest may really be driven by only one component, so that using the discrepancy score leads to misleading conclusions. That is, in the present research, one could argue that a relationship between the meta-bases discrepancy index and information interest may be obtained when really, only the affective meta-bases (or only the cognitive-bases) are related to information interest (or persuasion). Additional analyses will be reported using affective and cognitive meta-bases as separate predictors to address this issue. As further analyses in the current studies demonstrate, both affective and cognitive meta-bases predict the variable of interest (i.e., information interest or persuasion), although predictions are strongest when the meta-bases discrepancy index is used. This suggests that the predictive power of meta-bases on information interest or persuasion is not driven solely by affective meta-bases or cognitive meta-bases. Stated differently, the discrepancy between affective meta-bases and cognitive meta-bases provides additional information beyond the separate meta-bases. As noted earlier, the discrepancy reflects an individual preference for one type of basis over the other.

4 In additional analyses, I created a discrepancy index from NA and NC to reflect a preference for emotionally-arousing events over cognitive challenges, as such an index would be more equivalent (than treating NA and NC as separate predictors) to the meta-bases measure with respect to reflecting a preference. This relative need for affect index
was created by subtracting participants’ standardized NC scores from their standardized NA scores. As the only predictor in the model, relative need for affect predicted the use of affect in determining choice such that higher one’s relative need for affect the more one relied on the affect-cognition quality of a book in book preference, $\beta = .30$, $t(42) = 2.05$, $p = .05$. However, when meta-bases and relative need for affect were entered in a simultaneous regression analysis, results showed that only meta-bases predicted reliance on the affect-cognitive quality of a book, $\beta = .43$, $t(41) = 2.74$, $p = .01$ but relative need for affect did not, $\beta = .09$, $t(41) = .55$, $p = .59$. This suggests that relative need for affect predicted the use of the affect-cognition dimension in book preference to the extent that it covaried with meta-bases.

I also conducted analyses using affective and cognitive meta-bases as separate predictors rather than using the index created from the discrepancy between the two variables. Results revealed that when only affective and cognitive meta-bases were entered as the predictors, both predicted the use of affect in book ranking such that affective meta-bases predicted greater use of affect in book ranking, $\beta = .46$, $t(41) = 3.20$, $p < .01$, whereas cognitive meta-bases predicted less use of affect in book ranking, $\beta = -.34$, $t(41) = -2.37$, $p = .02$.

When separate affective and cognitive meta- and structural bases, as well as NC, NA and use of character in book ranking were entered simultaneously in another
regression, cognitive meta-bases still predicted use of affect, $\beta = -.37, t(36) = -2.52, p = .02$. There was a marginal tendency for affective meta-bases to predict use of affect, $\beta = .34, t (36) = 1.96, p = .06$. None of the other personality variables, including separate affective and cognitive structural bases, predicted use of affect (all $ps > .16$).

Pilot testing indicated that the anti-smoking messages tended to differ in their absolute cognitive qualities but did not differ in their emotional qualities. In the pilot test, for each message, participants indicated the extent to which the message appealed to their feelings, the extent to which the message added to their emotions about smoking, and the extent to which the message led them to form opinions toward smoking based on their feelings. Participants also indicated the extent to which each message appealed to their reasoning, the extent to which each message added to their knowledge, and the extent to which the message led them to form opinions toward smoking based on their thoughts. Results revealed that the affective message ($M = 6.35, SD = .47$) tended to have less cognitive qualities than the cognitive message ($M = 7.45, SD = .47$), $F (1, 61) = 3.37, p = .07$. With respect to absolute emotional qualities, the affective message ($M = 7.50, SD = .52$) did not differ from the cognitive message ($M = 7.04, SD = .41$), $F (1, 61) = .49, p = .49$. To compare the messages in their relative affective-cognitive qualities, we computed a relative emotions-arousing index by subtracting the average of the cognitive responses from the average of the emotional responses. The extent to which the message elicited
emotions rather than thoughts was greater for the affective version \((M = 1.15, SD = .35)\) than the cognitive version \((M = - .41, SD = .28)\), \(F (1, 61) = 12.29, p = .001\).

\(^7\) In an additional regression analysis in which relative need for affect was entered as the only predictor (see Footnote 4 above), results revealed that relative need for affect did not predict the proportion of time spent reading the affective message, \(\beta = -.11, t (57) = -.83, p = .41\).

\(^8\) As in Study 1, I conducted additional analyses using affective and cognitive meta-bases as separate predictors (see Footnote 5). Results revealed that when only affective and cognitive meta-bases were entered as the predictors, cognitive meta-bases predicted a lower proportion of time spent on reading the affective message, \(\beta = -.32, t (56) = -2.06, p = .04\). Affective meta-bases did not predict the proportion of time spent on reading the affective message although the trend was in the expected direction, \(\beta = .22, t (56) = 1.41, p = .16\).

When separate affective and cognitive meta- and structural bases, as well as NC and NA were entered simultaneously in another regression, cognitive meta-bases still predicted a lower proportion of time spent on reading the affective message, \(\beta = -.35, t (52) = -2.18, p = .03\). As in the earlier regression, affective meta-bases did not predict the proportion of time spent reading the affective information although the trend was in the expected direction, \(\beta = .25, t (52) = 1.54, p = .13\). There was also a marginally significant
tendency for NC to predict a greater proportion of time spent reading the affective information, \( \beta = .28, t (52) = 1.85, p = .07 \). This might have been due to participants’ perception that the affective information was more challenging to process than the cognitive information. Affective structural bases, cognitive structural bases and NA did not predict relative reading time (all \( ps > .20 \))

A pilot study demonstrated that the pro-blood donation messages did not differ in their absolute cognitive qualities but did in their emotional qualities. In the study, participants indicated the extent to which the message appealed to their affect and the extent to which the message appealed to their cognition (see Footnote 6 above for the questions used). Results showed that the affective message (\( M = 7.00, SD = .37 \)) appeared to be equivalent to the cognitive message (\( M = 6.76, SD = .47 \)) in its cognitive qualities, \( F (1, 61) = .16, p = .69 \). However, the affective message (\( M = 7.73, SD = .42 \)) was perceived to have more emotional qualities than the cognitive message (\( M = 6.36, SD = .53 \)), \( F (1, 61) = 4.06, p = .05 \). To compare the messages in their relative affective-cognitive qualities, a relative emotions-arousing index was created by subtracting the average of the cognitive responses from the average of the emotional responses. The extent to which the message elicited emotions rather than thoughts was greater for the affective message (\( M = .73, SD = 1.20 \)) than for the cognitive message (\( M = -.40, SD = 1.58 \)), \( F (1, 61) = 10.18, p < .01 \).
A regression analysis with pre-message attitudes as a covariate and post-message attitudes as a dependent variable was also conducted. Results were virtually identical to the change score analysis. To match the conceptualization of the dependent measure (i.e., persuasion), the change score analysis is reported in the text.

An alternative view of these interactions is that for the cognitive message, those with cognitive bases (meta- and structural) were more persuaded than those with affective bases, but for the affective message, basis made little difference. The fact that matching appeared to work better for one attitudinal basis than another (i.e., there is not a full crossover interaction) is a fairly common finding in research on affective-cognitive matching (e.g., see Fabrigar & Petty, 1999; Huskinson & Haddock, 2004) and various factors can contribute to this. In the current study, cognitive meta-base individuals tended to change their attitudes more than affective meta-base individuals. One possibility is that the messages were different in their affective-cognitive qualities in relative but not absolute terms. That is, the affective and cognitive messages were actually equivalent in their cognitive qualities although significantly different in their affective qualities (see Footnote 8). Thus, the affective message was still somewhat persuasive to the cognitive meta-base individuals even if less so compared to the cognitive message. Therefore, a full cross-over interaction would presumably have been obtained on the cell means if the affective message had less cognitive qualities than the cognitive message on an absolute
level. When all main effect variance is removed from the cell means, the interaction variance alone would form a crossover pattern (Petty, Fabrigar, Wegener, & Priester, 1996; Rosenthal & Rosnow, 1985).

Furthermore, as in Studies 1 and 2, I conducted regression analyses using affective and cognitive meta-bases and structural bases as separate predictors. In addition, interaction terms involving the separate meta-bases and message type as well as the separate structural bases and message type were included in the second step. Results showed that there was a tendency for affective meta-bases to interact with message type in predicting attitude change, $\beta = .11, t (135) = 1.71, p = .09$. The same was true for cognitive meta-bases in the opposite direction, $\beta = -.11, t (135) = -1.66, p = .10$. As for structural bases, the multicollinearity involving affective structural bases and cognitive structural bases rendered regression analyses with those separate terms problematic.

Indeed, pilot testing of the video and book ranking tasks to be used in this study (N = 22) confirmed that participants took a shorter time to complete the second ranking task than the first one regardless of whether the book task preceded the video task or vice-versa, $ps < .01$. 

12
In all four studies, when affective and cognitive meta- and structural bases were examined separately, no correlation was found between affective meta-bases and affective structural bases or between cognitive meta-bases and cognitive structural bases (with the exception of a marginally significant correlation between cognitive meta-bases and affective structural bases at $p = .07$ in Study 3, all $ps > .10$).
LIST OF REFERENCES


APPENDIX A

SAMPLE MATERIALS FROM STUDY 1
In this session, you will be participating in separate experiments. In the first experiment, you will help us test the validity of different personality scales. Please follow the instructions for each scale. If you want to withdraw from the session at any point, you may do so without losing credit.
NC scale:

For each of the statements below, please indicate to what extent the statement is characteristic of you. Please use the following scale:

1 = extremely uncharacteristic
2 = somewhat uncharacteristic
3 = uncertain
4 = somewhat characteristic
5 = extremely characteristic
I would prefer complex to simple problems.

1. extremely uncharacteristic
2. somewhat uncharacteristic
3. uncertain
4. somewhat characteristic
5. extremely characteristic

Need for Cognition Scale Sample Item
Thinking is not my idea of fun.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>extremely uncharacteristic</td>
</tr>
<tr>
<td>2</td>
<td>somewhat uncharacteristic</td>
</tr>
<tr>
<td>3</td>
<td>uncertain</td>
</tr>
<tr>
<td>4</td>
<td>somewhat characteristic</td>
</tr>
<tr>
<td>5</td>
<td>extremely characteristic</td>
</tr>
</tbody>
</table>
NFA scale: Please indicate the extent to which you agree with the following statements.
If I reflect on my past, I see that I tend to be afraid of feeling emotions.

-3 strongly disagree
-2
-1
0
1
2
3 strongly agree

Need for Affect: Motivation to Avoid Emotions Subscale Sample Item
Need for Affect: Motivation to Approach Emotions Subscale Sample Item

I feel that I need to experience strong emotions regularly.

-3  strongly disagree
-2
-1
0
1
2
3  strongly agree
Attitudes inventory

Sometimes, people’s opinions regarding various issues and objects can be indicative of their personality. Please be honest in expressing your attitudes toward the various objects. Please be assured that your responses will be anonymous. That is, your answers will not be linked to your name.
Please answer the following questions about your opinion toward abortion.
Please click on the number on each of the following scales that best describes your FEELINGS about abortion.
Thinking of abortion makes me feel ________.

-5 sad
-4
-3
-2
-1
0
1
2
3
4
5 delighted

Structural Bases: Affect Sample Item
Please click on the number on each of the following scales that best describes your BELIEFS about abortion.
Abortion is a ________ thing to have.

-5 useless
-4
-3
-2
-1
0
1
2
3
4
5 useful

Structural Bases: Cognition Sample Item
Please click on the number on each scale that best describes your attitude about abortion:

Structural Bases: Attitude Instructions
My overall attitude toward abortion is _______________.
To what extent do you think your attitudes toward abortion are driven by your emotions?

- 5 not at all driven by my emotions
- 4
- 3
- 2
- 1
  0
  1
  2
  3
  4
  5 totally driven by my emotions

Meta-bases: Affect Sample Item
To what extent do you think your attitudes toward abortion are driven by your beliefs?

-5 not at all driven by my beliefs
-4
-3
-2
-1
0
1
2
3
4
5 totally driven by my beliefs

Meta-bases: Cognition Sample Item
Welcome to this study! We are interested in looking at how people make decisions about what books they like to read. In order to prevent any personal bias (e.g. for a particular author) on your part, we have excluded information that may let you identify the following fiction books. Instead, for each book, we will provide a very brief excerpt from a critic’s review. In addition, we will also give you ratings from last quarter’s participants who have actually read excerpted passages from the books.
<table>
<thead>
<tr>
<th>Book</th>
<th>Excerpt from book review</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book A</td>
<td>“...this gripping story is full of twists and turns that leave readers in jaw-clenching suspense...”</td>
<td>★★★★★</td>
</tr>
<tr>
<td>Book B</td>
<td>“...the writer raises questions regarding the ethical implications of technological advances...”</td>
<td>★★★★☆</td>
</tr>
<tr>
<td>Book C</td>
<td>“...the ending will make readers re-examine their assumptions about America's economic diversity...”</td>
<td>★★★★☆</td>
</tr>
<tr>
<td>Book D</td>
<td>“...this is a funny read that will leave you in stitches as the protagonist stumbles from one adventure to another...”</td>
<td>★★★★☆</td>
</tr>
<tr>
<td>Book E</td>
<td>“...this book is filled with eye-opening perspectives that make us think beyond today's headlines...”</td>
<td>★★★★★</td>
</tr>
<tr>
<td>Book F</td>
<td>“...the author narrates the family's experience in a way that successfully displays the full range of human emotion...”</td>
<td>★★★★☆</td>
</tr>
</tbody>
</table>

Book Preferences: Excerpts from Book Reviews
Ratings from last quarter’s OSU students

Last quarter, our student participants read excerpts from the books and rated the books according to the extent to which
1.) the book stimulates thinking
2.) the characters are well-developed
3.) how book elicits emotions
4.) the writing style is distinctive

Students rated each book on a scale from 1 to 5, where
1 = does not make me think at all, no character development at all, does not make me feel anything, or extremely common writing and
5 = makes me think a lot, superb character development, makes me experience strong emotions, or extremely distinctive writing.

Please review the averaged ratings from last quarter before you rank the books yourself.
<table>
<thead>
<tr>
<th></th>
<th>Stimulates thinking?</th>
<th>Well-developed characters?</th>
<th>Elicits emotions?</th>
<th>Distinctive writing style?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book A</td>
<td>2.1</td>
<td>1.9</td>
<td>4.5</td>
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</tr>
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<td>Book B</td>
<td>4.5</td>
<td>4.1</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Book C</td>
<td>4.4</td>
<td>3.4</td>
<td>1.9</td>
<td>3.3</td>
</tr>
<tr>
<td>Book D</td>
<td>1.9</td>
<td>2.3</td>
<td>4.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Book E</td>
<td>4.6</td>
<td>1.8</td>
<td>2.2</td>
<td>4.4</td>
</tr>
<tr>
<td>Book F</td>
<td>3.0</td>
<td>3.9</td>
<td>4.4</td>
<td>1.7</td>
</tr>
</tbody>
</table>
Book Ranking Screen 1
Book Ranking Screen 2
APPENDIX B

MESSAGES FROM STUDY 2
CIGARETTES

John tried his first cigarette at the age of 14. Smoking was a means for him to fit in with his new friends at school. It did not take long for John to realize that he was addicted to cigarettes. His addiction turned him into a sneak, a liar and a thief. He stole money from his younger brother to buy cigarettes because he could not afford to buy the quantity he had to smoke. Even after he became a father to two children, the lying did not stop. He borrowed money from his brother and lied that the money was for an X-Box for his son’s birthday. He lied to his doctor, insisting that he smoked “only less than a pack a day.” He was absolutely ashamed but could not stop. He was compelled to such action, all because of his nicotine addiction.
In 1999, John was diagnosed with cancer in the larynx. The doctor suggested a laryngectomy, which meant that John could not talk again. When John first got home after the operation, his children ran away from him when they saw the hole in his throat. He opened his mouth to call them but no voice came out. Soon later, he suffered from withdrawal symptoms from having stopped smoking. He experienced increased anger and hostility, and had problems with basic cognitive functions such as language comprehension. Worse still, his older son Jimmy was diagnosed with bronchitis, a disease common in people exposed to secondhand smoke. Guilt overcame John but it was too late. When smoking doesn’t kill, it destroys.
CIGARETTES

Patient who has undergone laryngectomy

Please click to continue

Affective Anti-smoking Message Screen 3
CIGARETTES

Forty years have passed since the first Surgeon General’s report on smoking and health. Yet smoking remains the leading preventable cause of death in this country. Tobacco continues to cost our society too many lives and too many dollars. The new Surgeon General’s report illustrates the harmful impact of smoking on many organs in the body. The report’s statistics and conclusions highlight the necessity of remaining vigilant in our smoking prevention efforts. For example, smoking causes 87% of lung cancer, and most cancers of the larynx, oral cavity, esophagus, and bladder. In addition, secondhand smoke is responsible for an estimated 3,000 lung cancer deaths among nonsmokers each year. This is no surprise considering that tobacco smoke contains
CIGARETTES

thousands of chemical agents, including over 60 substances that are known to cause cancer.

Cigarette smoking has been the most popular method of taking nicotine since the beginning of the 20th century. Nicotine is highly addictive. Nicotine provides an almost immediate “kick” because it causes a discharge of epinephrine from the adrenal cortex. This “kick” then leads the abuser to seek more nicotine. Addiction to nicotine results in withdrawal symptoms when a person tries to stop smoking. For example, during periods of abstinence and/or craving, smokers have shown impairment across a wide range of psychomotor and cognitive functions, such as language comprehension. Such are the harmful effects of smoking.
CIGARETTES

Smoking Status of adults aged 21-45 years

Percentage of adults aged 21-45 years

Ad Council –tobacco msg 3 p. 3

Cognitive Anti-smoking Message Screen 3
APPENDIX C

MESSAGES FROM STUDY 3
Blood donation

Kelly is bursting with excitement. She knows that there is always a need for blood donation, and she is glad to be able to contribute. The red cells in her blood will be useful for the treatment of all sorts of anemia and for sickle cell disease—imagine that! The platelets in her blood can be used for patients undergoing chemotherapy—she is going to help save lives! Kelly is filled with joy as she thinks about how she will help save others such as Jake. Kelly has read about poor Jake, who was diagnosed with leukemia at the age of 6. Jake had to undergo chemotherapy, which took a huge strain on his young life. In fact, Jake narrowly escaped death from a bone marrow infection that occurred as a side effect of chemotherapy. Every year, about 110,960 chemotherapy patients are in need of your blood. Be a happy blood donor today!
Blood donation makes you feel good all over!
Blood donation

Did you know that every day, new medical treatments are being developed and more operations are being carried out? Not surprisingly, blood donations are always needed. About 2.5 million blood donations, to be exact. The donated blood can be used in several ways. Blood as a whole is rarely used, except in cases of severe blood loss. Usually, blood is separated into its individual components to be used. Red blood cells are widely used to replace lost blood during surgery, or in the treatment of anemia and sickle cell disease. Platelets are used to help patients undergoing chemotherapy or suffering from leukemia. These are but a few examples of how the donated blood can be used. Every year, about 110,960 chemotherapy patients are in need of your blood. Be a helpful blood donor today!
Give a gift that costs nothing to give!

Cognitive Blood Donation Message Screen 2
APPENDIX D

SAMPLE MATERIALS FROM STUDY 4
Welcome to this study! We are interested in looking at how people make decisions about what books they like to read. To avoid personal biases, we are not telling you the titles of the books. Instead, we will give you ratings from last quarter’s participants who have actually read excerpted passages from the books.
Ratings from last quarter’s OSU students

Last quarter, our student participants read excerpts from the books and rated the books according to the extent to which
1.) the book stimulates thinking
2.) the characters are well-developed
3.) the book elicits emotions
4.) the plot is well-developed

Students rated each book on a scale from 1 to 5, where
1 = does not make me think at all, no character development at all, does not make me feel anything, or no plot development at all and
5 = makes me think a lot, superb character development, makes me experience strong emotions, or excellent plot development.

Please review the averaged ratings from last quarter before you rank the books according to how interested you are in reading them yourself.
### Ratings from last quarter’s OSU students

<table>
<thead>
<tr>
<th></th>
<th>Stimulates thinking</th>
<th>Well-developed characters</th>
<th>Elicits emotions</th>
<th>Plot development</th>
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<tbody>
<tr>
<td>Book A</td>
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<td>1.9</td>
<td>4.5</td>
<td>4.5</td>
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<td>Book B</td>
<td>4.5</td>
<td>4.1</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Book C</td>
<td>4.4</td>
<td>3.4</td>
<td>1.9</td>
<td>3.3</td>
</tr>
<tr>
<td>Book D</td>
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<td>2.3</td>
<td>4.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Book E</td>
<td>4.6</td>
<td>1.8</td>
<td>2.2</td>
<td>4.4</td>
</tr>
<tr>
<td>Book F</td>
<td>3.0</td>
<td>3.9</td>
<td>4.4</td>
<td>1.7</td>
</tr>
</tbody>
</table>
Book Ranking Screen 1
Book Ranking Screen 2
Video Clips for Psychology 100

Thank you for ranking the books. We are also interested in what types of video clips introductory psychology students prefer as supplementary materials for the psychology 100 course. In order to exclude any personal bias for certain topics (e.g. memory, personality etc.), we have excluded information that will let you identify the relevant topic in each clip. Instead, we will give you ratings from students in the psychology 100 course last year.
Ratings from last quarter’s OSU students

Last quarter, psychology 100 students watched the clips and rated each clip according to the extent to which
1.) the clip has good audiovisual quality
2.) the clip arouses emotions
3.) the clip is of appropriate length
4.) the clip stimulates thinking

Students rated each clip on a scale from 1 to 10, where
1 = poor audiovisual quality, does not make me feel anything, too long for class, or does not make me think at all, and
10 = good audiovisual quality, makes me experience strong emotions, of appropriate length for class, or makes me think a lot.

Please review the averaged ratings from last quarter before you rank the clips yourself.
<table>
<thead>
<tr>
<th>Clip</th>
<th>Audiovisual quality?</th>
<th>Provokes feelings?</th>
<th>Appropriate length?</th>
<th>Stimulates thinking?</th>
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</thead>
<tbody>
<tr>
<td>Clip 1</td>
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<td>Clip 2</td>
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<td>8.8</td>
<td>9.2</td>
</tr>
<tr>
<td>Clip 3</td>
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<td>4.6</td>
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<td>4.0</td>
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</table>
Clip Ranking Screen 1
Clip Ranking Screen 2
Figure 1: Top panel: Uni-Construct view where objective and subjective measures are treated as tapping the same construct. Bottom panel: Dual-Construct view where objective and subjective measures are treated as tapping separate construct.
Figure 1.

Attitudinal property
\[ e.g. \textit{accessibility} \]

- Structural Measures
- Meta-attitudinal Measures

Structural property
\[ e.g. \textit{accessibility} \]

- Meta-attitudinal property
  \[ e.g. \textit{meta-accessibility} \]

- Structural Measures
- Meta-attitudinal Measures
Figure 2. Top panel: Impact of structural bases on attitude change as a function of message type. The cognitive structural base group consists of individuals who are at one standard deviation below mean structural bases. The affective structural base group consists of individuals who are at one standard deviation above mean structural bases. Bottom panel: Impact of meta-bases on attitude change as a function of message type. The cognitive meta-base group consists of individuals who are at one standard deviation below mean meta-bases. The affective meta-base group consists of individuals who are at one standard deviation above mean meta-bases.
Figure 2.
Table 1. Correlations Among Structural Bases, Meta-bases, Need for Affect and Need for Cognition.

* $p < .05$. ** $p < .01$
Table 2. Correlations Among Structural Bases, Meta-bases, Need for Affect and Need for Cognition.

<table>
<thead>
<tr>
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<th>4</th>
<th>5</th>
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<td>.02</td>
<td>-.03</td>
<td>-.08</td>
<td>.04</td>
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<td>2. Meta-bases</td>
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<td>3. Need for Affect (NA)</td>
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<td>4. Need for Cognition (NC)</td>
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* *p < .05. ** *p < .01