THE SEQUENTIAL EXPOSURE BIAS:
A PREFERENCE FOR APPROACHING PRO-ATTITUDINAL BEFORE COUNTER-ATTITUDINAL INFORMATION THAT CAN BIAS EVALUATIVE JUDGMENTS

BY

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DISSERTATION

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ABSTRACT

When searching for information, people often engage in behaviors that lead to biased rather than accurate judgments (e.g., confirmation bias). The present research identified the *sequential exposure bias*, defined as a tendency to approach attitude-supportive (congenial) information before attitude-unsupportive (uncongenial) information when searching for information. Participants were more likely to approach congenial before uncongenial information for a variety of stimuli, including novel consumer products (Studies 1-4) and important social topics such as civil rights (Studies 5-6). Further, the sequential exposure bias influenced downstream judgments via primacy effects – when participants initially liked (disliked) a stimulus, they tended to approach positive (negative) information first, and this approach order caused final attitudes to be relatively more positive (negative). Consequently, the sequential exposure bias helps individuals defend their attitudes against the persuasive influence of uncongenial information. Importantly, participants induced to have a strong desire to defend their attitudes displayed a stronger sequential exposure bias, indicating that the sequential exposure bias is sometimes deliberately used for attitude defense (Study 5). Although it was hypothesized that a strong accuracy motivation would reduce the sequential exposure bias, accuracy motivation could not be successfully manipulated to test this hypothesis (Study 6). Finally, individuals displayed consistent patterns of sequential exposure decisions across stimuli (Studies 1, 7, and 8), suggesting that individuals have consistent preferences for the order in which they approach positive versus negative information. Overall, the present research identified the sequential exposure bias as a novel information search behavior that has the potential to bias information search outcomes by making people relatively resistant to uncongenial information.

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CHAPTER 1: INTRODUCTION

Before spending money on a product, using a medical treatment, or voting for a politician, people often search for relevant information to guide their decisions. When doing so, they generally encounter positive and negative information – the product will have some favorable reviews and some unfavorable reviews, the medical treatment will have some intended effects and some side effects, and the politician will support some views that constituents like and some they dislike. Though people occasionally avoid one side of an issue altogether (Hart et al., 2009; Sweeny, Melnyk, Miller, & Shepperd, 2010), approach to both sides of an issue requires a simple choice: Which set of information will be approached first? Although seemingly innocuous, the order in which people process positive and negative information can profoundly affect their responses to that information (Haugtvedt & Wegener, 1994; Petty, Tormala, Hawkins, & Wegener, 2001). Further, when searching for information about a topic, the motivation to confirm pre-existing attitudes is often stronger than the motivation to develop accurate attitudes, and this imbalance leads to the use of biased information search strategies (e.g., selective exposure; Hart et al., 2009). Surprisingly, no research has examined whether individuals strategically use processing order effects to defend their attitudes. As biased information search strategies can yield invalid attitudes that promote poor decision making (Kray & Galinsky, 2003; Greitemeyer & Schulz-Hardt, 2003; Sweeny et al., 2010), the present research seeks to discover whether attitude-confirming information is deliberately sought out before or after attitude-disconfirming information and whether these sequential exposure decisions influence resulting attitudes.

I propose that individuals have a *sequential exposure bias*, defined as an information search strategy in which attitude-supportive ("congenial") information is approached before attitude-unsupportive ("uncongenial") information. An *attitude* is defined as an individual's overall evaluation of a target (e.g., a behavior, event, issue, object, person, etc.; Albarracin & Vargas, 2010). Thus, positive (negative) information is congenial with positive (negative) attitudes, whereas negative (positive)

information is uncongenial with positive (negative) attitudes. Information that contains both congenial and uncongenial statements ("two-sided information") generally motivates people to elaborate on and thus resolve discrepancies in that information (Festinger, 1957, 1964; Hastie 1980; Jonas, Diehl, & Brömer, 1997; Maheswaran & Chaiken 1991; McGuire 1981; Sengupta & Johar, 2002; Srull and Wyer 1989). For example, receiving two-sided information about a consumer product can result in more elaboration of the information than receiving an equal amount of information that is only positive or only negative (Jonas et al., 1997). Moreover, high levels of elaboration during the presentation of messages yields primacy effects, in which the information presented first has a stronger influence on final attitudes than the information presented last (Haugtvedt & Wegener, 1994; Petty et al., 2001). Elaboration elicits primacy effects because thoroughly considering the initial information promotes thoughts favorable to that side of the issue, and those thoughts then influence the interpretation and scrutiny of the subsequent information.

Despite the field's extensive knowledge of order effects in message processing, it is currently unknown whether individuals *deliberately choose* to approach congenial information before or after uncongenial information. Previous research has only examined how individuals respond to being presented with two-sided messages, neglecting how individuals organize these messages for personal consumption. Although forced exposure is representative of many real life situations (e.g., being presented with political ads on television), information choices are increasingly prevalent. For example, online retailers such as Amazon.com allow users to sort customer reviews by valence (e.g., from 1-star to 5-star reviews or vice-versa). Additionally, when reading news articles, people can choose to read articles that are favorable to a topic before or after articles that are unfavorable. Finally, when people deliver mixed news, they often ask the message recipients whether they want the good news first or the bad news first. It is currently unknown whether information seekers use their initial attitudes to organize such two-sided messages. This is an important question because the order in which messages

are processed can influence subsequent judgments (Haugtvedt &Wegener, 1994). Consequently, any association between initial attitudes and decisions about exposure order has the potential to bias the learning that occurs during an information search. Specifically, if individuals deliberately approach congenial before uncongenial information, this exposure order may render attitudes resistant to the uncongenial message, thus biasing people against the use of potentially legitimate information.

The sequential exposure bias represents an order-dependent effect of information search on attitudes that has not been identified to date. This effect suggests that equal exposure to congenial and uncongenial information may not be sufficient to guarantee impartial attitudes given that, all else equal, the sequential nature of information processing still provides opportunities for attitudes to become biased. Further, this strategy should be used more often when people are motivated to defend their pre-existing attitudes than when they are motivated to hold accurate attitudes. Moreover, if people frequently use this strategy, its use may interact with certain personality traits (e.g., optimism) to bias most of an individual's attitudes in either a positive or a negative direction, thus potentially creating individual differences in the tendency to have positive versus negative attitudes in general (a trait known as the dispositional attitude; Hepler & Albarracin, 2013a). These processes are summarized in Figure 1.

1.1 Sequential exposure as a defense strategy

People are often interested in defending their current attitudes (e.g., Festinger, 1957), and this motivation is expressed in a variety of ways when searching for information (Sweeny et al., 2010). For example, people commonly evince a congeniality bias, in which they approach more congenial than uncongenial information (Eagly & Chaiken, 1993, 1998, 2005; Frey, 1986; Hart et al., 2009; Jonas, Schulz-Hardt, Frey, & Thelen, 2001). The congeniality bias leaves information seekers with a plethora of information in support of their initial attitudes and little evidence against them, which causes attitudes to remain unchanged or to strengthen (Hart et al., 2009). Other times, people engage in pure

information avoidance, in which they decide to avoid information altogether and thus remain ignorant about a topic. Information avoidance is often used when the only information available is likely to be uncongenial (Sweeny et al., 2010). For instance, consumers who purchase a product and believe they might have overpaid are likely to avoid learning any information about how much others spent on the same product (Vohs, Baumeister, & Chin, 2007). Finally, sometimes people have an uncongeniality bias, in which they approach more uncongenial than congenial information. This occurs when they believe the information that is available will be weak and easy to argue against (Frey, 1986; Kleinhesselink & Edwards, 1975). Under these conditions, people prefer to approach uncongenial information because doing so allows them to easily show why the opposing side of an issue is wrong, which ultimately strengthens their convictions in their original opinion (Lowin, 1967). Thus, people use a variety of strategies to defend their attitudes when they search for information.

The sequential exposure bias represents a hereto unidentified information search strategy that people may use to defend their attitudes. The sequential exposure bias may be used instead of using other strategies (e.g., information avoidance) or in combination with them (e.g., congeniality and uncongeniality biases). Regardless, processing congenial before uncongenial information has been shown to make attitudes resistant to persuasion (McGuire & Papageorgis, 1961) due to such mechanisms as thought-induced attitude polarization (Tesser & Conlee, 1975), enhanced attitude confidence (Sherman & Gorkin, 1980), and increased memory for congenial information (Lydon, Zanna, & Ross, 1988). Although these effects are well established in the context of information exposure paradigms in which researchers control the order of presentation of two-sided information (Haugtvedt & Wegener, 1994; Petty et al., 2001), no research has examined whether individuals deliberately choose to approach congenial before uncongenial information when given a choice.

Approaching congenial information first will only help individuals defend their attitudes if doing so results in a primacy effect. Primacy effects occur to the extent that processing initial information in a

sequence yields resistance to subsequent information (e.g., Haugtvedt & Wegener, 1994; Petty et al., 2001). For example, when reading messages about the implementation of comprehensive college exams, participants who demonstrated primacy effects also demonstrated an increased tendency to counter-argue the information presented second, whereas participants who demonstrated recency effects did not (Haugtvedt & Wegener, 1994). Consequently, if this increased resistance to the information encountered second were overcome by other factors, then the biasing effect of sequential exposure should decrease. For example, people may be forced to elaborate on the second information set to a greater extent than the first information set. In other words, the biasing effect of approaching congenial information first should be neutralized if people are forced to think about the later, uncongenial information more than the initial congenial information.

Although people may use the sequential exposure bias under certain conditions, it is unlikely that people will always choose to approach congenial information first. Instead, use of the sequential exposure bias should depend on motivations that occur during information searches. Two important motivations commonly guide information searches: defense and accuracy motivations (Chaiken, Liberman, & Eagly, 1989). Defense motivation concerns a desire to confirm pre-existing attitudes, whereas accuracy motivation concerns a desire to form and maintain valid attitudes. Defense-promoting strategies such as the congeniality bias are used more when defense motivation is high and less when accuracy motivation is high (Hart et al., 2009). Defense motivation is activated and increased by a variety of factors (Hart et al., 2009), such as an increased personal commitment to an attitude (Abelson, 1988; Harmon-Jones & Harmon-Jones, 2008; Schwarz, Frey, & Kumpf, 1980). For example, when individuals explain or justify their attitudes to others (e.g., in a discussion), their commitment to the attitude increases (Betsch, Haberstroh, Glöckner, Haar, & Fiedler, 2001; Schwarz et al., 1980), and they subsequently use strategies such as the congeniality bias to avoid the unpleasant realization that the attitude they just expressed may be bad or incorrect (i.e., they do this to avoid cognitive dissonance;

Brehm & Cohen, 1962; Kiesler, 1971). In contrast, accuracy motivation is often activated when the information being sought can facilitate the achievement of important goals (Chaiken et al., 1989; Hart et al., 2009). For example, when preparing for a debate, individuals frequently search for information in an unbiased manner, equitably approaching both congenial and uncongenial information (Canon, 1964; Freedman, 1965). As initial approach to congenial information can result in successful attitude defense, people who have a strong defense motivation (i.e., a goal to successfully defend their attitudes) should be more likely to use the sequential exposure bias. Oppositely, stronger accuracy motivation should be associated with a weaker sequential exposure bias. Further, as attitude defense is the most common goal during information searches (Hart et al., 2009), the sequential exposure bias should be observed at baseline.

In sum, the proposed sequential exposure bias involves approaching congenial before uncongenial information. I further predict that individuals who initially approach congenial information will be more resistant to uncongenial information, but this effect should be eliminated or even reversed if resistance to the information approached second is otherwise reduced. Finally, because this strategy promotes attitude defense, defense and accuracy motivations should increase and decrease the use of this strategy, respectively.

1.2 Additional factors that may influence sequential exposure decisions

Defense and accuracy motivations are relevant to the sequential exposure bias because they are critical antecedents of other information search biases, such as the congeniality bias (Chaiken et al., 1989; Hart et al., 2009). However, sequential exposure decisions are most likely multiply determined, and a variety of other factors may influence the decision to approach congenial information before or after uncongenial information including the following. (a) Self-affirmation: When people self-affirm, uncongenial information is rendered less threatening (Sherman & Cohen, 2002), and this may lead to a decreased initial approach toward congenial information. (b) Validity-seeking: Because individuals may

view congenial information to be more valid than uncongenial information (Lord, Ross, & Lepper, 1979), they may approach congenial information first because they want to approach information with higher perceived validity before information with lower perceived validity. (c) Ease of processing: Congenial information may be easier to process than uncongenial information, and people may thus approach congenial information first so they can make a quick decision and then process the later uncongenial information with little attention. (d) Lay theories: People may hold explicit beliefs about whether it is more appropriate or strategic to approach congenial information first or last, and these beliefs may impact sequential exposure decisions. (e) Mood maintenance: Individuals may approach congenial information first either to extend a current positive mood as long as possible or to create a positive mood that will buffer against anticipated negative reactions to uncongenial information. In sum, various factors other than defense and accuracy motivations may influence sequential exposure decisions. However, because defense and accuracy motivations frequently occur during information searches (Chaiken et al., 1989; Hart et al., 2009), the present research will focus on these two motivations as moderators of the sequential exposure bias.

1.3 Sequential exposure as an antecedent of dispositional attitudes

People who are chronically motivated to defend their attitudes may frequently use the sequential exposure bias by approaching congenial information first. Further, individuals may differ in whether positive or negative information tends to be congenial. For example, optimists have generalized positive expectations, and thus positive information should be more likely to be congenial than negative information (and vice-versa for pessimists). Thus, given a strong defense motivation, optimists may generally approach positive information first, whereas pessimists may generally approach negative information first. Further, habitually approaching positive or negative information first may influence people's tendency to form positive or negative attitudes in general. That is, if optimists generally

approach positive information first when searching for information, they may ultimately form a larger number of positive attitudes.

Of relevance, individuals differ in the tendency to have positive versus negative attitudes, which is a trait known as the dispositional attitude (Hepler & Albarracin, 2013a). Dispositional attitudes are a bias in attitude formation and expression, such that some individuals display an overall positivity bias in their attitudes, whereas others display an overall negativity bias (i.e., some people tend to like things whereas others tend to dislike things). The sequential exposure bias may contribute to dispositional attitudes for people who have a strong motivation to defend prior attitudes. Specifically, optimists seeking attitude-defense may habitually approach positive information first and form attitudes that confirm their initial positive expectations regardless of the attitude-object. Optimists not seeking attitude-defense, however, may be less likely to strategically prioritize positive information and thus may not show a bias in their dispositional attitudes. These predictions are summarized in Table 1.

To summarize, individual differences in expectations about stimuli (e.g., optimism) and defense motivation should interact to predict sequential exposure decisions across attitude-objects. Further, consistently approaching positive or negative information first may subsequently influence dispositional attitudes. Therefore, I will also examine (a) if sequential exposure decisions are relatively consistent when examining within-person, between-stimulus decisions, (b) whether the valence of the information approached first is predicted by the interaction of optimism and defense motivation, and (c) whether sequential exposure is related to dispositional attitudes. If so, then sequential exposure use would be shown to not only bias specific attitudes, but also to bias aspects of personality.

1.4 Overview

The present research seeks to explore the phenomenon of the sequential exposure bias, defined as an information search strategy in which individuals choose to approach congenial before uncongenial information. This research will attempt to (a) determine whether pre-existing attitudes are an

antecedent of sequential exposure decisions, (b) establish whether sequential exposure decisions influence resulting attitudes, (c) determine whether the biasing effects of sequential exposure decisions can be eliminated by increasing the impact of the last information in the sequence, (d) investigate defense and accuracy motivations as moderators of sequential exposure decisions, and (e) examine whether sequential exposure is related to dispositional attitudes.

Study 1 serves as an initial test of the predictions related to the sequential exposure bias, including whether prior attitudes motivate sequential exposure decisions and whether sequential exposure decisions influence subsequent attitudes. Study 2 manipulates initial attitudes to examine if initial attitudes causally influence sequential exposure decisions. Study 3 manipulates the order of information presentation to examine if order per se causally influences the results of information searches. Study 4 examines if the sequential exposure bias's downstream effects on attitudes can be eliminated by increasing elaboration of the information approached last. Studies 5 and 6 examine if sequential exposure decisions are moderated by defense and accuracy motivations, respectively. Finally, Studies 7 and 8 examine whether individuals differ in the tendency to approach positive or negative information first as a function of their optimism and defense motivation, and whether this tendency is related to dispositional attitudes.

CHAPTER 2: STUDY 1 – THE SEQUENTIAL EXPOSURE BIAS

Study 1 served as an initial test of the predictions related to the sequential exposure bias. Specifically, this study examined whether sequential exposure decisions are related to (a) initial attitudes and (b) final attitudes via primacy effects. Participants completed an ostensible "consumer opinion survey" in which they read about and evaluated three novel consumer products. For each product, participants provided their initial attitudes before learning anything about the product other than its name. Participants then decided whether they would read positive product reviews before or after negative product reviews, and the reviews were then presented in the chosen order. Participants then reported their final attitudes toward the product. This procedure occurred separately for each product, which allowed for a test of whether individuals consistently approached positive or negative information first.

2.1 Method

2.1.1 Participants. Participants (*N* = 300) were recruited online using Amazon's Mechanical Turk website and were paid $0.25 to complete the study. The age of respondents ranged from 19 to 71 (*M* = 31.39, *SD* = 10.72). In this sample, 42% of respondents were female, 73% had a bachelor's degree or higher, and the modal income category was $0 - $24,999. The sample was 46% Indian, 25% Non-Indian Asian, 23% Caucasian, and 6% other.

2.1.2 Procedure. Participants completed an ostensible consumer opinion survey in which they read about and evaluated three fictitious products: the "Monahan LPI-800 Compact Microwave Oven," "Sunny Valley Premium Roast Coffee," and "Frontier Cigarettes." Although these products are fictitious, participants were led to believe that they were real. The products were presented sequentially in random order. For each product, participants were initially presented with the product name and were asked to provide their initial attitudes for the product using four 7-point semantic differential scales ("I think [product name] will be something that…" *I dislike/I like, is bad/is good, is useless/is useful, is*

unfavorable/is favorable). Next, participants were told they would read six product reviews from actual customers who purchased the product, three of which were "5-star (positive)" and three of which were "1-star (negative)." Participants were told that although they would read all six reviews, they would choose whether to read the positive reviews first or the negative reviews first, and that all reviews of one type (positive or negative) would be presented together in a set. Next, participants were presented with all six reviews in their chosen order (the review stimuli are listed in Appendix A). Participants then reported their attitudes toward the product using four 7-point semantic differential scales ("This product is something that…" *I dislike/I like, is bad/is good, is useless/is useful, is unfavorable/is favorable*). This procedure was repeated for the remaining two products. Finally, participants completed the Dispositional Attitude Measure (DAM) to measure dispositional attitudes (see Appendix B).

The survey included four "attention check" questions that read: "This question checks whether you are skipping questions. Select the middle option." These questions were randomly inserted throughout the questionnaires, and the response option to be selected varied across each question. Ninety-nine respondents failed at least two attention check questions. Their submissions were rejected, and their data were not recorded. Therefore the sample size of 300 respondents does not include those who failed this manipulation check.

2.2 Results and Discussion

2.2.1 Calculating measures. Descriptive statistics for all measures are displayed in Table 2. Initial and final attitudes were calculated by averaging the respective semantic differential items for each product. The sequential exposure decisions were coded as 0 if participants chose to read the negative reviews first for a given product and 1 if participants chose to read the positive reviews first. Participants were more likely to read positive reviews before negative reviews for the microwave product (68% chose positive first; Binomial $p < .001$) and coffee product (65% chose positive first; Binomial $p < .001$)

but were equally likely to choose positive or negative information first for the cigarette product (45% chose positive first; Binomial p = .12).

2.2.2 Descriptive analyses. For each product, sequential exposure decisions were significantly positively correlated with both initial and final attitudes (Table 2). Therefore, when participants initially liked a stimulus, they were more likely to approach positive before negative information (and vice-versa) which supports the prediction that individuals tend to approach congenial information first, thus establishing the existence of the sequential exposure bias. Further, participants who chose to read positive information before negative information for a given product formed more positive final attitudes toward that product (and vice-versa), which supports the prediction that the sequential exposure bias can influence subsequent attitudes via primacy effects.

2.2.3 Mediation analysis. The indirect effect of initial attitude on final attitude through sequential exposure order was estimated using bias corrected bootstrapping with 10,000 resamples (Preacher & Hayes, 2004). The mediation model appears in Figure 2, and the path coefficients and indirect effects for each stimulus appear in Table 3. For each stimulus, the indirect effect was positive and the 95% confidence interval did not include zero. Therefore, participants with positive (negative) initial attitudes tended to have more positive (negative) final attitudes in part because they approached positive (negative) information first. These results support the hypothesis that sequential exposure decisions function to defend pre-existing attitudes – i.e., approaching positive information first allows individuals with initially positive attitudes to maintain relatively positive final attitudes, and vice-versa.

2.2.4 Sequential exposure and dispositional attitudes. To examine whether participants consistently approached positive or negative information first across stimuli (e.g., always choosing positive or negative first), sequential exposure decisions for each product were summed together to form an overall exposure index. Values ranged from 0 (always read negative reviews first) to 3 (always read positive reviews first) with a mean of 1.77 (SD = 1.05). Fourteen percent of participants scored 0,

25% scored 1, 29% scored 2, and 31% scored 3. Therefore, participants did not display a common strategy, but rather a great deal of between-participant variance existed. Cronbach's α for the exposure index was .56, and the average inter-item correlation was .30. Thus, the valence of the information approached first was relatively consistent when examining within-participant, between-stimulus decisions. This is initial evidence that some individuals consistently approach one type of information (positive or negative) before the other regardless of whether the attitude-objects are normatively negative or positive. Further, dispositional attitudes were positively correlated with this index ($r(300) = .20$, $p = .001$), suggesting that the more an individual tended to approach positive before negative information, the more positive their attitudes were in general (for unrelated attitude-objects), and vice-versa.

2.2.5 Conclusions. The results from this study provided strong support for the existence of a sequential exposure bias in information search behaviors. Specifically, across three separate stimuli, participants were significantly more likely to approach congenial information before uncongenial information than vice-versa. Further, a significant indirect effect of initial attitudes on final attitudes through sequential exposure order was observed. Consequently, the sequential exposure bias increased the consistency between initial and final attitudes, which suggests that the sequential exposure bias functions to defend initial attitudes. Finally, across a variety of attitude-objects (including normatively negative and positive stimuli), individuals displayed consistency in the valence of the information they chose to approach first. The form of this consistency (generally approaching positive or negative first) was correlated with dispositional attitudes, suggesting that individuals who consistently approach positive (negative) information first may consistently form more positive (negative) attitudes in general.

CHAPTER 3: STUDY 2 – THE CAUSAL ROLE OF PRE-EXISTING ATTITUDES

Because the present theory predicts that initial attitudes influence sequential exposure decisions, it is important to provide persuasive evidence for this causal link. Although initial attitudes and sequential exposure decisions were related in Study 1, the correlational design of Study 1 leaves open the possibility that initial attitudes and sequential exposure decisions were not causally related, but rather correlated with one another because both were influenced by other factors. Therefore, the primary objective of Study 2 is to investigate whether initial attitudes causally influence sequential exposure decisions. To this end, the paradigm employed in Study 2 is similar to Study 1, with the exception that participants' initial attitudes were manipulated rather than measured.

3.1 Method

3.1.1 Participants. Participants (*N* = 200) were recruited online using Amazon's Mechanical Turk website and were paid $0.25 to complete the study. The age of respondents ranged from 19 to 66 (*M* = 30.26, *SD* = 8.52). In this sample, 38% of respondents were female, 87% had a bachelor's degree or higher, and the modal income category was $0 - $24,999. The sample was 56% Indian, 33% Non-Indian Asian, 10% Caucasian, and 1% other.

3.1.2 Procedure. Participants first completed a brand preference survey, in which they reported their attitudes toward 10 well-known international brands (e.g., Coca-Cola, Google) using scales from *1* (*extremely unfavorable*) to *7* (*extremely favorable*). Participants were then told they would complete a consumer opinion survey about one product. To manipulate initial attitudes about the upcoming product, participants were either told that the results of the brand preference survey indicated that they would strongly like or strongly dislike the upcoming product; assignment to the positive and negative initial attitude conditions was random and independent of participants' actual responses to the brand preference survey. Next, participants completed the same consumer opinion survey used in Study 1. The procedure was identical, except participants only evaluated the "Monahan LPI-800 Compact Microwave

Oven" (and not the other two products) and they did not report initial attitudes. The survey included the same "attention check" questions used in Study 1. Thirty-five respondents failed at least two attention check questions. Their submissions were rejected, and their data were not recorded. Therefore the sample size of 200 respondents does not include those who failed this manipulation check.

3.2 Results and Discussion

3.2.1 Calculating measures. Descriptive statistics for all measures are displayed in Table 4. Final attitudes and sequential exposure decisions were calculated as in Study 1. Initial attitudes were coded as 0 for the negative attitude condition (n = 94) and 1 for the positive attitude condition (n = 106).

3.2.2 Descriptive analyses. Participants were more likely to approach positive before negative reviews in both the positive initial attitude condition (77% chose positive first; Binomial $p < .001$) and negative initial attitude condition (62% chose positive first; Binomial $p = .03$). However, participants in the positive initial attitude condition were significantly more likely to approach positive information first compared to participants in the negative initial attitude condition, $t(198) = 2.44$, $p = .02$. As initial attitudes were manipulated, this study demonstrates that initial attitudes can causally influence sequential exposure decisions. Replicating Study 1, final attitudes toward the product were positively correlated with sequential exposure decisions (Table 4).

3.2.3 Mediation analysis. The data were analyzed using the same mediation approach as Study 1, and the resulting path coefficients and indirect effect appear in Table 5. The indirect effect was positive and the 95% confidence interval did not include zero. Therefore, participants induced to have positive (negative) initial attitudes tended to have more positive (negative) final attitudes in part because they approached positive (negative) information first. These results replicated Study 1 while manipulating initial attitudes, which demonstrates that initial attitudes causally influence sequential exposure decisions and thus causally contribute to biased outcomes for information searches involving approach to two-sided information.

CHAPTER 4: STUDY 3 – THE CAUSAL ROLE OF SEQUENTIAL EXPOSURE

As the present theory predicts that the sequential exposure bias can influence attitudes (i.e., via primacy effects), it is important to provide evidence for this causal link. Therefore, the primary objective of Study 3 was to investigate whether sequential exposure order causally influences final attitudes. To this end, the paradigm employed in Study 3 is similar to Study 1, with the exception that sequential exposure order was manipulated rather than allowing participants to select an exposure order.

4.1 Method

4.1.1 Participants. Participants (*N* = 300) were recruited online using Amazon's Mechanical Turk website and were paid $0.25 to complete the study. The age of respondents ranged from 19 to 67 (M = 30.18, SD = 9.52). In this sample, 40% of respondents were female, 80% had a bachelor's degree or higher, and the modal income category was $0 - $24,999. The sample was 63% Indian, 24% Non-Indian Asian, 9% Caucasian, and 4% other.

4.1.2 Procedure. Participants completed the same consumer opinion survey used in Study 1. The procedure was identical, except participants only evaluated the "Monahan LPI-800 Compact Microwave Oven" (and not the other two products) and were randomly assigned to an information order (positive-then-negative or negative-then-positive) rather than being allowed to choose an order. Before being exposed to the information, participants were told they would read six reviews, three of which were positive and three of which were negative. They were told that the reviews would be presented in a randomly determined order, such that all positive reviews would be presented followed by all negative reviews or vice-versa. Therefore, participants in this study were just as informed as participants in Studies 1-2 about the two-sided nature of the upcoming information, but they were unable to sort the information as participants in previous studies were allowed to do. The survey included the same "attention check" questions used in Studies 1-2. One-hundred eleven respondents failed at least two attention check questions. Their submissions were rejected, and their data were not

recorded. Therefore the sample size of 300 respondents does not include those who failed this manipulation check.

4.2 Results and Discussion

4.2.1 Calculating measures. Descriptive statistics for all measures are displayed in Table 6. Initial and final attitudes were calculated as in Study 1. Sequential exposure was coded as 0 (1) if participants were assigned to read negative (positive) reviews first.

4.2.2 Descriptive analyses. As a manipulation check, initial attitudes and information order were uncorrelated, indicating that random assignment to information order was successful with respect to initial attitudes (Table 6). Importantly, a primacy effect was observed between information order and final attitudes, thus replicating Studies 1-2. Because sequential exposure order was manipulated, Study 3 provides evidence that order per se causally influences final attitudes via primacy. This dovetails with previous research on order effects, in which primacy effects occur in high-elaboration conditions such as when people are exposed to two-sided information (Haugtvedt & Wegener, 1994). Therefore, when participants deliberately approach congenial information first (e.g., in Studies 1-2), their sequential exposure decisions may cause an attitudinal bias in the direction of that congenial information.

4.2.3 Mediation analysis. The data were analyzed using the same approach as Studies 1-2, and the resulting path coefficients and indirect effect appear in Table 7. The indirect effect should be non-significant because the indirect effect depends on the relation between initial attitudes and information order, and information order was manipulated independently of initial attitudes. As anticipated, the 95% confidence interval for the indirect effect included zero, and thus was not significant. This demonstrates that information order only mediates the relation between initial and final attitudes when individuals are allowed to choose the order in which they approach that information. In other words, the sequential exposure bias can only be used to defend initial attitudes to the extent that exposure order is influenced by initial attitudes.

CHAPTER 5: STUDY 4 – ELIMINATING THE BIASING CONSEQUENCES OF SEQUENTIAL EXPOSURE

Primacy effects occur to the extent that the information approached first increases resistance to the information approached last (e.g., Haugtvedt & Wegener, 1994). Therefore, the sequential exposure bias should only be an effective attitude defense strategy to the extent that the information approached last remains unpersuasive. If the persuasiveness of the later information increased, the defense-promoting consequences of the sequential exposure bias should decrease or even reverse. Given that the persuasive messages used in the present research contain strong arguments, a simple way to increase the persuasiveness of this information is to increase participants' elaboration of the information (Petty & Cacioppo, 1986). Therefore, to examine whether the consequences of the sequential exposure bias can be eliminated, Study 4 manipulated the amount of elaboration directed toward information approached first versus last. Specifically, half of the participants were required to produce three thoughts in response to each product review for the review set approached first and one thought in response to each product review for the review set approached second. This directly manipulated the amount of relative elaboration, such that these participants thought more about early relative to late information, and this condition should therefore replicate the results observed in Studies 1-3 (i.e., participants should be relatively resistant to information encountered second). In contrast, the second half of participants were required to produce only one thought in response to each product review for the review set approached first and three thoughts in response to each product review for the review set approached second. Having participants think more about late relative to early information should reverse the pattern of results observed in Studies 1-3. That is, increasing the amount of elaboration of the second information set should increase the persuasiveness of that information and eliminate the primacy effect induced by the use of the sequential exposure bias.

5.1 Method

5.1.1 Participants. Participants (*N* = 300) were recruited online using Amazon's Mechanical Turk website and were paid $0.25 to complete the study. The age of respondents ranged from 19 to 72 (*M* = 30.26, *SD* = 9.92). In this sample, 35% of respondents were female, 78% had a bachelor's degree or higher, and the modal income category was $0 - $24,999. The sample was 46% Indian, 37% Non-Indian Asian, 12% Caucasian, and 5% other.

5.1.2 Procedure. Participants completed the same consumer opinion survey used in Study 1, except participants only evaluated the "Monahan LPI-800 Compact Microwave Oven" (and not the other two products). To manipulate elaboration, participants were assigned to one of two conditions. In the "3-then-1" thought condition, participants provided three thoughts in response to each product review they chose to approach first and one thought in response to each product review they chose to approach second. This condition should cause participants to be more persuaded by the reviews they chose to read first. In the "1-then-3" thought condition, participants provided one thought in response to each product review they chose to approach first and three thoughts in response to each product review they chose to approach second. This condition should cause participants to be more persuaded by the reviews they chose to read second. Participants were unaware of the elaboration manipulation when making sequential exposure decisions. All other aspects of the procedure remained the same as Study 1. The survey included the same "attention check" questions used in Studies 1-3. Seventy-five respondents failed at least two attention check questions. Their submissions were rejected, and their data were not recorded. Therefore the sample size of 300 respondents does not include those who failed this manipulation check.

5.2 Results and Discussion

5.2.1 Calculating measures. Descriptive statistics for all measures are displayed in Table 8; results are separated by elaboration condition (*n* = 150 in each condition). Table 8 also displays comparable results from Studies 1-3 for comparison purposes. Attitudes and sequential exposure

decisions were calculated using the same methods as Study 1. Participants were more likely to approach positive reviews before negative reviews in the 3-then-1 condition (66% chose positive first; Binomial $p < .001$) and the 1-then-3 condition (61% chose positive first; Binomial $p = .01$). As anticipated, sequential exposure decisions did not differ between conditions, $t(298) = .96$, $p = .34$.

5.2.2 Descriptive analyses. The 3-then-1 condition replicated Studies 1-3, such that sequential exposure decisions were significantly positively correlated with both initial and final attitudes (Table 8). In contrast and as predicted, information order was positively correlated with initial attitudes but not final attitudes in the 1-then-3 condition. Instead, when participants elaborated more on information approached last, sequential exposure order was unrelated to final attitudes. Therefore, despite allowing participants to choose the order in which they approached information (and thus allowing the sequential exposure bias to occur), it was possible to eliminate the attitude-biasing effect of sequential exposure by having participants spend more effort thinking about the information approached last.

5.2.3 Mediation analysis. The data were analyzed separately for each elaboration condition using the same approach as Studies 1-3, and the resulting path coefficients and indirect effects appear in Table 9. The 3-then-1 condition replicated the results of Studies 1-3 with a positive and significant indirect effect. In contrast, and as predicted, the 1-then-3 condition produced a negative indirect effect whose 95% confidence interval did not include zero. Therefore, forcing participants in the 1-then-3 condition to elaborate more on information approached last produced a recency effect rather than a primacy effect when controlling for initial attitudes. That is, participants in the 1-then-3 condition who had initial positive (negative) attitudes approached positive (negative) information first, but they ultimately developed more negative (positive) attitudes. This reversal occurred because participants were forced to elaborate more on information approached last, and thus their attitudes were more influenced by the later information that was inconsistent with their initial attitudes.

Thus, the downstream effects of the sequential exposure bias can be eliminated (and even reversed) by increasing the persuasiveness of information approached later. Therefore, although the sequential exposure bias can influence the outcome of an information search, this influence can be overcome by deliberately processing information approached later with more effort than information approached earlier. Although the present research demonstrated a reversal (rather than elimination) of the sequential exposure bias's effects, it should be possible to strike a meaningful balance of differential elaboration that would nullify the effects. Overall, Study 4 demonstrated that the sequential exposure bias facilitates attitude defense to the extent that approaching congenial before uncongenial information increases resistance to the information approached later, and behaviors that reduce this resistance can eliminate the defensive effects of this bias.

CHAPTER 6: STUDY 5 – DEFENSE MOTIVATION AS A MODERATOR

Although the results of Studies 1-4 demonstrated that the sequential exposure bias can facilitate defensive processing objectives (i.e., sequential exposure decisions increased the consistency between initial and final attitudes), it is possible that this defensive facilitation is incidental rather than motivated. In other words, Studies 1-4 do not provide any direct evidence that the sequential exposure bias is influenced by the defense-related motivational states of the individuals making the exposure decisions. Therefore, defense motivation was manipulated in Study 5 to provide direct evidence that it is involved in the sequential exposure bias. Specifically, increasing defense motivation should strengthen the sequential exposure bias because individuals will become particularly motivated to confirm their pre-existing attitudes (Hart et al., 2009). A variety of factors can influence the motivation to defend one's attitude, including commitment to the attitude because having an important attitude disconfirmed is particularly upsetting (Brehm & Cohen, 1962; Kiesler, 1971). A common method for increasing attitude commitment is to have participants explain or justify the attitude (e.g., in a written essay; Harmon-Jones & Harmon-Jones, 2008; Olson & Stone, 2005; Schwarz et al., 1980). Therefore, in Study 5 participants reported their attitudes, wrote an essay justifying their attitudes (high defense motivation condition) or wrote nothing (control condition), and then chose the order in which they approached congenial versus uncongenial information. I predict that participants in the high defense motivation condition (versus control) will show a stronger sequential exposure bias.

6.1 Method

6.1.1 Pretest 1: Selecting an attitude-object. Although Studies 1-4 provided evidence that the sequential exposure bias occurs for novel attitude-objects, it is important to examine whether this bias occurs for pre-existing attitudes-objects as well. Therefore, Studies 5-6 will use attitude-objects for which most participants have strong pre-existing attitudes. To select appropriate stimuli, I conducted a pretest in which participants reported their attitudes toward 43 potentially divisive social issues.

Participants (N = 200) were recruited online using Amazon's Mechanical Turk website and were paid $0.10 to complete the pretest. The age of respondents ranged from 18 to 72 (*M* = 30.17, *SD* = 9.90). In this sample, 46% of respondents were female, 73% had a bachelor's degree or higher, and the modal income category was $0 - $24,999. The sample was 43% Indian, 30% Non-Indian Asian, 23% Caucasian, and 4% other. Participants reported their attitudes toward 43 non-consumer attitude-objects using a single-item scale from 1 (strongly dislike) to 7 (strongly like). The list of attitude-objects and ratings can be found in Appendix C. The distributions of the items were examined to identify attitude-objects with bimodal distributions because this distribution form indicates that many participants held strong, polarized attitudes toward the stimulus. Four items satisfied this criterion: equal rights for heterosexual and homosexual couples, legalized abortion, taxing unhealthy food purchases, and capital punishment (see Figure 3). To confirm the multimodality of the distributions, Hartigan's dip statistic (HDS) was calculated for each item (Freeman & Dale, 2013). The HDS values of .12 (equal rights for heterosexual and homosexual couples), .10 (legalized abortion), .11 (taxing unhealthy food purchases), and .09 (capital punishment) were all significant at $p < .001$, thus confirming the presence of multimodality for these attitude-objects. Of these four items, I selected two at random to be used in Studies 5-6: Equal rights for heterosexual and homosexual couples (Study 5) and legalized abortion (Study 6).

6.1.2 Pretest 2: Commitment manipulation. Participants will either be induced to write an essay justifying their beliefs (high defense motivation condition) or not (control condition) because this manipulation has proven effective in prior research (Harmon-Jones & Harmon-Jones, 2008; Olson & Stone, 2005; Schwarz et al., 1980). To confirm the success of this manipulation, an independent group of participants (*N* = 200) was recruited online using Amazon's Mechanical Turk website and was paid $0.10 to complete a manipulation pretest. The age of respondents ranged from 19 to 70 (*M* = 31.03, *SD* = 10.52). In this sample, 45% of respondents were female, 68% had a bachelor's degree or higher, and the modal income category was $0 - $24,999. The sample was 36% Indian, 30% Non-Indian Asian, 24%

Caucasian, and 10% other. Participants reported their attitudes toward "equal rights for homosexual and heterosexual couples" using four 7-point semantic differential scales ("I think [this topic] is…" *bad/good*, *unacceptable under all circumstances/acceptable under all circumstances*, *definitely wrong/definitely right*, *unfavorable/favorable*). Next, participants were either assigned to write an essay justifying their attitudes (n = 87) or not (n = 113). The essay instructions read as follows:

> "We want to know more about your attitude. Using the box below, please write at least 5 sentences explaining why you feel this way about equal rights for homosexual and heterosexual couples. When doing so, please explain your beliefs as if you had to justify yourself to someone who disagrees with you. That is, try to explain why you think that you are right."

Next, all participants completed a 6-item measure of attitude commitment adapted from Abelson (1988), which includes items such as "How strongly do you hold your views on this topic?" and "How often do you think about this topic?" (see Appendix D for the full measure). Responses to the six items were internally consistent (α = .87) and thus averaged to form an overall commitment index. Participants in the essay condition (M = 4.90, SD = 1.20) reported being significantly more committed to their attitudes than participants in the control condition (M = 4.34, SD = 1.46), t(198) = 2.91, p = .004. Therefore, the essay manipulation successfully influenced attitude commitment.

6.1.3 Power analysis. To determine an appropriate sample size for Study 5, I conducted a power analysis. I used a value of q = .20 as an anticipated effect size because no prior research has examined moderation of the sequential exposure bias and q = .20 is the typical effect size found in social-personality psychological research (Richard, Bond, & Stokes-Zoota, 2003). Because I had a strong a priori directional hypothesis, I computed the sample size necessary to detect an effect size of .20 with α = .05 and power = .80 for a one-tailed test of the difference between two independent correlations using the G*Power program (Faul, Erdfelder, Lang, & Buchner, 2007). Based on these parameters, a total sample size of N = 626 (n = 313 per condition) is required.

6.1.4 Participants. Participants (*N* = 626) were recruited online using Amazon's Mechanical Turk website and were paid $0.30 to complete the study. The age of respondents ranged from 18 to 72 (*M* = 33.47, *SD* = 11.10). In this sample, 44% of respondents were female, 67% had a bachelor's degree or higher, and the modal income category was $0 - $24,999. The sample was 38% Caucasian, 31% Indian, 26% Non-Indian Asian, and 5% other.

6.1.5 Procedure. Participants completed an opinion survey similar to Studies 1-4 for the topic of "equal rights for heterosexual and homosexual couples." Participants were initially presented with this topic and were asked to provide their attitudes using four 7-point semantic differential scales ("I think [this topic] is…" *bad/good, unacceptable under all circumstances/acceptable under all circumstances, definitely wrong/definitely right, unfavorable/favorable*). Next, to manipulate defense motivation, half of the participants (*n* = 313) were required to write an essay justifying their attitudes (see pretest above for manipulation details). The other half of participants (*n* = 313) served as the control group and were not required to justify their attitudes; these participants did not write an essay.

Next, participants were told that they would read six brief opinion pieces "that appeared together in a recent issue of a prestigious international newspaper," three of which were "opinions in support (pros)" and three of which were "opinions in opposition (cons)" of this topic. In reality, these messages were adapted from persuasive arguments listed on the political website procon.org (see Appendix E for stimuli). Participants were told that although they would read all six opinions, they would choose whether to read the pros or cons first. Next, participants were presented with the opinions in their chosen order. Participants were then told, "Your attitude may or may not have changed since the beginning of the survey, and either way is fine." Participants then reported their final attitudes using four 7-point semantic differential scales that included different scale anchors from the initial attitude measure ("I think [this topic] is…" *negative/positive, never justified/always justified, something I completely oppose/something I completely favor, undesirable/desirable*). The survey included the same

"attention check" questions used in Study 1. Thirty-five respondents failed at least two attention check questions. Their submissions were rejected, and their data were not recorded. Therefore the sample size of 626 respondents does not include those who failed this manipulation check.

6.2 Results and Discussion

6.2.1 Calculating measures. Descriptive statistics for all measures are displayed in Table 10, with the results separated by defense motivation condition. Initial attitudes, final attitudes, and sequential exposure decisions were calculated as in Studies 1-4.

6.2.2 Moderation analyses. Initial attitudes significantly predicted sequential exposure decisions for both conditions (Table 10). This demonstrates that the sequential exposure bias can occur for attitudes concerning important, pre-existing attitude-objects in addition to novel attitude-objects as examined in Studies 1-4. To examine the hypothesis that the sequential exposure bias is moderated by defense motivation, the correlation between initial attitudes and sequential exposure decisions was compared between conditions using a Fisher r-to-z transformation. The defense motivation condition had a significantly larger correlation than the control condition, $z = 2.09$, $p_{1\text{-}tail} = .02$. Therefore, the defense manipulation successfully increased the magnitude of the sequential exposure bias, such that participants required to justify their attitudes displayed a stronger tendency to approach congenial before uncongenial information relative to control participants.

6.2.3 Mediation analyses. The data were analyzed separately for each condition using the same approach as Studies 1-4, and the resulting path coefficients and indirect effects appear in Table 11. Although initial attitudes were related to sequential exposure decisions for both conditions, sequential exposure decisions were unrelated to final attitudes when controlling for initial attitudes, and the indirect effect was consequently not significant. Although the sequential exposure bias can influence final attitudes as demonstrated in Studies 1-4, it should not be expected to always influence attitudes. For example, if the messages that individuals receive are too weak relative to their current attitudes

(i.e., they are not effective persuasive messages), then the messages will not influence attitudes. The present study used an attitude-object for which most individuals had strong, polarized attitudes, thus decreasing the probability of attitude change in response to any set of presented messages. In support of this possibility, the correlation between initial and final attitudes in Study 5 was r = .94 for the essay condition and r = .89 for the control condition, whereas this correlation in the previous studies that used novel attitude-objects ranged from .33 to .81 with a sample-size weighted average of .52. Thus, attitudes in Study 5 displayed much more consistency between time 1 (pre-message) and time 2 (post-message) than attitudes in Studies 1-4, indicating that the messages in Study 5 were relatively unpersuasive. It is particularly difficult to influence strong attitudes, but it is possible if strong enough persuasive messages are used. Therefore, although the sequential exposure bias did not influence final attitudes in this particular study, it is still reasonable to expect an influence of sequential exposure on final attitudes under the right circumstances (i.e., when the messages are appropriately persuasive).

6.3 Replication: Study 5b

As these results are critical for providing evidence that the sequential exposure bias is partially caused by defense motivation, I directly replicated the results.

6.3.1 Power analysis. To determine an appropriate sample size for the replication, I conducted a power analysis using the effect size obtained in the initial study (q = .17 based on correlations of r = .29 for the high defense condition and r = .13 for the control condition). I computed the sample size necessary to detect an effect size of .17 with α = .05 and power = .80 for a one-tailed test of the difference between two independent correlations using the G*Power program (Faul et al., 2007). Based on these parameters, a total sample size of N = 886 (n = 443 per condition) is required.

6.3.2 Participants. Participants (N = 886) were recruited online using Amazon's Mechanical Turk website and were paid $0.30 to complete the study. The age of respondents ranged from 18 to 77 (M = 31.54, SD = 10.90). In this sample, 41% of respondents were female, 72% had a bachelor's degree or

higher, and the modal income category was $0 - $24,999. The sample was 39% Indian, 28% Non-Indian Asian, 27% Caucasian, and 6% other.

6.3.3 Procedure. The procedure was identical to the original Study 5. The survey included the same "attention check" questions. One-hundred three respondents failed at least two attention check questions. Their submissions were rejected, and their data were not recorded. Therefore the sample size of 886 respondents does not include those who failed this manipulation check.

6.3.4 Results and Discussion. The results replicated. All measures were calculated in the same way as the original study. Descriptive statistics and mediation results are displayed in Tables 12 and 13, respectively. Critically, the sequential exposure bias was once again moderated by defense motivation, such that the correlation between initial attitudes and sequential exposure decisions was larger for the high defense motivation condition relative to the control condition, $z = 1.94$, $p_{1\text{-tail}} = .03$. Therefore, the replication results reaffirm the findings of the original study.

6.4 Conclusions

Study 5 and its replication demonstrated two important findings. First, the sequential exposure bias occurred for attitude-objects toward which individuals had strong, pre-existing attitudes. Second, this bias was moderated by commitment to the attitude, such that higher commitment led to an increased tendency to approach congenial before uncongenial information. This is a critical finding for the present theory because it demonstrates that the sequential exposure bias can be moderated by the defense-related motivational states of information seekers.

CHAPTER 7: STUDY 6 – ACCURACY MOTIVATION AS A MODERATOR

In Study 5, defense motivation was shown to moderate the sequential exposure bias by increasing the tendency to approach congenial before uncongenial information. Because defense and accuracy motivations often lead to opposite patterns of information approach (Hart et al., 2009), Study 6 examined whether accuracy motivation moderates the sequential exposure bias by decreasing the tendency to approach congenial before uncongenial information. Prior research has manipulated accuracy motivation by telling participants that they will engage in a debate with someone who opposes their view (Canon, 1964; Freedman, 1965). When individuals believe that they will have to debate someone, uncongenial information becomes particularly useful because it allows individuals to anticipate the arguments that will be made by their opponents, which allows them to plan effective rebuttals. Therefore, in Study 6 participants reported their attitude, were told that they may have to debate someone who disagrees with them (high accuracy motivation condition) or not (control condition), and then chose the order in which they approached congenial versus uncongenial information. I predict that participants in the high accuracy motivation condition (vs. control) will show a weaker tendency to approach congenial information first.

7.1 Method

7.1.1 Power analysis. Because the design of Study 6 is similar to Study 5, I determined an appropriate sample size using the parameters of $\alpha = .05$, power = .80, and anticipated effect size $q = .20$ (the average effect size in social-personality psychology; Richard et al., 2003). Therefore, a total sample size of $N = 626$ ($n = 313$ per condition) is required.

7.1.2 Participants. Participants ($N = 626$) were recruited online using Amazon's Mechanical Turk website and were paid $0.20 to complete the study. The age of respondents ranged from 18 to 69 ($M = 30.99$, $SD = 10.06$). In this sample, 41% of respondents were female, 77% had a bachelor's degree or

higher, and the modal income category was $0 - $24,999. The sample was 48% Indian, 31% Non-Indian Asian, 16% Caucasian, and 5% other.

7.1.3 Procedure. The procedure was similar to Study 5 with the following exceptions. First, the opinion survey was for the topic of "legalized abortion" (see Appendix E for the opinion stimuli). Second, in the experimental condition, accuracy motivation (rather than defense motivation) was manipulated before participants chose the order in which to read the opinion pieces. This was accomplished by telling participants the following after they had reported their initial attitudes:

> "A random 25% of workers will be given an opportunity for bonus work that pays up to $10.00 for a 10 minute task. If you are selected and agree to participate, you will be paired up with someone who has a very [positive/negative] attitude toward legalized abortion. You will have a 10 minute "debate" with this person in a chat room. The other person will explain the reasons why they [support/oppose] legalized abortion, and your task will be to argue against whatever they say and convince them that they are wrong. You will earn $5 for participating, and can earn up to $10 if your arguments are judged to be very persuasive. You will be informed on the last page of this survey whether you were selected for this task."

Participants who initially reported a positive attitude toward legalized abortion were told they would debate someone with a very negative attitude, and vice-versa. Thus, regardless of initial attitudes, participants were told they may have been required to debate someone who disagreed with them. Participants in the control condition were not shown this message or informed of a potential debate. No participants actually engaged in a debate (i.e., at the end of the study, all participants were told that they were not selected for the debate task).

At the end of the study, a subset of participants in each condition (n = 134 and n = 126 in the control and accuracy conditions, respectively) responded to two manipulation check questions assessing their accuracy motivation (*When reading the opinion pieces, I was motivated to form an accurate*

attitude and *When reading the opinion pieces, I was motivated to really think about the statements that disagreed with me*; both questions used scales from *1 Not at all* to *7 Extremely*). The survey included the same "attention check" questions used in Study 1. Thirty respondents failed at least two attention check questions. Their submissions were rejected, and their data were not recorded. Therefore the sample size of 626 respondents does not include those who failed this manipulation check.

7.2 Results and Discussion

7.2.1 Calculating measures. Descriptive statistics for all measures are displayed in Table 14, with the results separated by accuracy motivation conditions. Initial attitudes, final attitudes, and sequential exposure decisions were calculated as in Studies 1-5.

7.2.2 Manipulation check. The accuracy manipulation did not successfully influence accuracy motivation. Participants in the high accuracy condition were not more motivated to form an accurate attitude (M = 5.13, SD = 1.53) than participants in the control condition (M = 5.14, SD = 1.50), $t(260)$ = .08, p = .93, nor were they more motivated to elaborate on uncongenial information (M = 4.64, SD = 1.60) than participants in the control condition (M = 4.76, SD = 1.64), $t(268)$ = .61, p = .54.

7.2.3 Moderation analyses. Initial attitudes significantly predicted sequential exposure decisions for both conditions. These results replicated Study 5 using a different attitude-object, and thus provide further evidence that the sequential exposure bias occurs for attitude-objects toward which participants have pre-existing, polarized attitudes. To examine whether the sequential exposure bias was moderated by accuracy motivation, the correlations between initial attitudes and sequential exposure decisions were compared using a Fisher r-to-z transformation. The conditions did not differ from each other, z = .52, p = .60. Therefore, the accuracy manipulation did not moderate the sequential exposure bias, which is unsurprising given that the manipulation check indicated that the accuracy manipulation failed.

7.2.4 Mediation analyses. The data were analyzed separately for each condition using the same approach as Studies 1-5, and the resulting path coefficients and indirect effects appear in Table 15.

Sequential exposure decisions were unrelated to final attitudes when controlling for initial attitudes, and the indirect effect was consequently not significant. As in Study 5, the attitude-object used in this study was chosen because it was a strong, polarizing item for this population, and initial (pre-message) and final (post-message) attitudes were highly correlated (r = .86 and r = .83 for the experimental and control conditions, respectively). Thus, the messages used in the present study were not successful at influencing participants' attitudes, and the lack of association between the sequential exposure and final attitudes may simply reflect the fact that stronger persuasive arguments were needed.

7.2.5 Conclusions. Study 6 replicated the association between initial attitudes and sequential exposure decisions for yet another attitude-object and provided further evidence that the sequential exposure bias occurs for pre-existing attitudes in addition to novel attitudes. However, the accuracy manipulation failed to influence accuracy motivation or sequential exposure decisions. It is therefore not possible to determine whether accuracy motivation moderates the sequential exposure bias. Given that defense motivation moderated this bias in Study 5, it is reasonable to expect accuracy motivation to moderate this effect as well. However, given the lack of successful accuracy motivation manipulation, this assertion currently remains an unexplored hypothesis. Future research could develop more effective accuracy motivation manipulations to test this hypothesis.

Past research that has successfully manipulated accuracy motivation has used two general strategies (Hart et al., 2009). The first strategy, which was used in the present research, attempts to make uncongenial information goal-relevant (i.e., useful) because when people believe that uncongenial information is useful, they are more likely to approach it. Thus, in past research, participants who thought they would have to debate someone with an opposing attitude showed a decreased congeniality bias (Canon, 1964; Freedman, 1965). The present research unsuccessfully used this manipulation in an attempt to increase accuracy motivation. One reason the manipulation may have failed is that participants may have thought an effective way to argue against an opponent in a debate is

to make arguments favoring the participants' own side rather than counter-arguing the opponent's side. This belief would make uncongenial information less (or equally) useful as the congenial information, which would undermine the intent of the manipulation. A second reason is that this manipulation could potentially influence either accuracy or defense motivation, depending on how participants construe the situation of a debate. For instance, participants could either conceptualize a debate as an opportunity to persuade an opponent (which may make uncongenial information very useful) or as a situation in which they must defend their own attitudes from attack (which may make congenial information very useful). The debate manipulation used in the present research was pioneered in the 1960s (Canon, 1964; Freedman, 1965), and it is plausible that people construe debates very differently today than they did several decades ago, thus rendering this manipulation less effective for modern participants. Overall, it is possible that a different manipulation that stresses the importance and utility of the uncongenial information could effectively increase accuracy motivation. For example, before making a sequential exposure decision, participants could be told that they will be quizzed only on uncongenial information and not on congenial information at the end of the study. Importantly, this would guarantee that the uncongenial information would have a higher utility value than the congenial information in the context of the study.

The second strategy used by past research to manipulate accuracy motivation is to increase the outcome-involvement of an information search (Albarracin, 2002; Chaiken, Wood, & Eagly, 1996; Johnson, 1994; Johnson & Eagly, 1989; Petty & Wegener, 1998). For example, participants who believed that they would make a decision that could result in the receipt of a prize were more motivated to accurately assess the decision-relevant information than participants who believed the decision would be free of personal consequences (Jonas & Frey, 2003). This manipulation could be adapted to for the purposes of the sequential exposure bias by requiring participants to make a sequential exposure

decision for a product that they believe they will have a chance to purchase at a discounted rate at the end of the study (high outcome relevance) or not (low outcome relevance).

To be clear, the present research provides no evidence for or against the possibility that accuracy motivation moderates the sequential exposure bias because accuracy motivation was not successfully manipulated. Thus, the status of accuracy motivation as a moderator must be determined by future research.

CHAPTER 8: STUDY 7 – THE STABILITY OF SEQUENTIAL EXPOSURE DECISIONS

As the sequential exposure bias can produce biased attitudes (e.g., Studies 1-4), it is possible that habitual patterns of sequential exposure lead to the formation of dispositional attitudes. That is, consistently approaching positive information before negative information could lead to the formation of more positive attitudes overall, and vice-versa. However, for this to occur, individuals must have relatively stable patterns of sequential exposure decisions across stimuli and time. Therefore, Study 7 investigated the stability of sequential exposure decisions in a test-retest study.

8.1 Method

8.1.1 Power analysis. To determine an appropriate sample size for this study, I conducted a power analysis using an anticipated effect size of at least $r = .50$ with $\alpha = .05$ and power = .80. An effect size of .50 was chosen because it was determined to be the smallest test-retest correlation of practical significance. In other words, values below this would not provide persuasive evidence for stability in sequential exposure decisions, whereas values above this would. I computed the required sample size for a one-tailed correlation test using the G*Power program (Faul et al., 2007). Based on these parameters, a total sample size of $N = 23$ is required. Because this is a test-retest study that will require the same group of participants to respond at two separate time points, and because I will be collecting data from online participants, I was concerned about significant participant attrition. Thus, I collected a larger sample than required.

8.1.2 Participants. Participants ($N = 84$) were recruited online using the research website socialsci.com and were paid $2.50 to complete the study. In total, 50 participants completed both time 1 and time 2 surveys, and only their data will be discussed. The age of respondents ranged from 19 to 74 ($M = 31.76$, $SD = 13.33$). In this sample, 48% of respondents were female and 72% had a bachelor's degree or higher. The sample was 88% Caucasian, 6% African-American, and 6% other. Information about participants' income was not collected.

8.1.3 Procedure. Participants completed two surveys separated by approximately four weeks. At time 1, participants were presented with an "opinion survey" that included 10 social-political topics (see Appendix F for a list of all topics). For each topic, participants were first presented with the topic area (e.g., "Legalized abortion") and were asked to report their initial attitude using three 7-point semantic differential scales ("I think [this topic] is…" *good/bad, definitely wrong/definitely right, unfavorable/favorable*). Next, participants were told that they would read two statements about the topic, and that "one will be positive (it will support the topic) and one will be negative (it will oppose the topic)." These statements were adapted from persuasive arguments listed on the political website procon.org (see Appendix G for opinion stimuli). Participants were told that although they would read both statements, they would choose whether to read the pro or con statement first. Next, participants were presented with the opinions in their chosen order. Participants were then told, "Your attitude may or may not have changed since the beginning of the survey, and either way is fine." Participants then reported their final attitudes using three 7-point semantic differential scales that included different scale anchors from the initial attitude measure ("I think [this topic] is…" *negative/positive*, *something I completely oppose/something I completely favor*, *undesirable/desirable*).

Approximately four weeks later, participants completed a similar survey that included a total of 20 topics (see Appendices F and G for a list of topics and topic-relevant messages, respectively). Ten of the topics were identical to the time 1 topics, whereas the remaining 10 were new. The old topics were presented in the same relative order at time 1 and time 2, and they appeared as the odd-numbered items in the time 2 survey. The survey procedures for time 2 were otherwise identical to time 1.

8.2 Results and Discussion

8.2.1 Calculating measures. The purpose of this study is to examine the stability of sequential exposure decisions (i.e., whether people consistently approach positive or negative information first), and thus the analyses will focus on the sequential exposure decisions participants made rather than

their attitudes. Each sequential exposure decision was coded as 0 (1) if participants chose to read the negative (positive) information first. The time 1 measure of sequential exposure was calculated by summing individual sequential exposure decisions, thus producing an index ranging from 0-10 ($\alpha = .83$). The time 2 index was calculated in three ways. First, an overall index was created by summing all 20 individual sequential exposure decisions, thus producing an index ranging from 0-20 ($\alpha = .92$). Second, an index was created from the 10 items used in both time 1 and time 2 surveys, thus creating an index ranging from 0-10 ($\alpha = .86$). Third, an index was created from the 10 items that were unique to the time 2 survey, thus creating an index ranging from 0-10 ($\alpha = .85$).

8.2.2 Analyses. For the 10 items used in both time 1 and time 2 surveys, the correlation between the exposure index at time 1 and time 2 was $r = .56$, $p < .001$. Similarly, the time 1 index was strongly correlated with the index for the 10 items unique to the time 2 survey ($r = .60$, $p < .001$) and for all 20 items on the time 2 survey ($r = .61$, $p < .001$).

8.2.3 Conclusions. Study 7 demonstrated that sequential exposure decisions were internally consistent when examining the valance of the information approached first versus last across multiple attitude-objects. Further, the preference for initial valence was relatively enduring over a short time interval. Therefore, Study 7 provided evidence that relatively stable individual differences may exist in sequential exposure decisions (note that this preference was measured without respect to the congenial or uncongenial nature of the information; this measure simply represented a consistent tendency to approach positive or negative information first).

CHAPTER 9: STUDY 8 – SEQUENTIAL EXPOSURE AND DISPOSITIONAL ATTITUDES

Because sequential exposure can produce biased attitudes (e.g., Studies 1-4), it is possible that habitual patterns of sequential exposure lead to the formation of dispositional attitudes. That is, consistently approaching positive information before negative information could lead to the formation of more positive attitudes overall, and vice-versa (this may be true whether or not the initially approached information is congenial or uncongenial). Although Study 1 provided initial evidence in favor of this possibility, the measure of sequential exposure consistency was only based on three sequential exposure decisions, and it demonstrated moderate reliability (alpha = .56). To more persuasively argue that individuals possess consistent sequential exposure habits, Study 8 attempted to replicate the findings from Study 1 while using an expanded and improved measure. Importantly, the attitude-objects included in the new measure were all fictitious, and thus any relation between sequential exposure and an average of the attitudes toward the items included in the measure would demonstrate that consistent sequential exposure decisions can causally influence dispositional attitudes (i.e., it would demonstrate that sequential exposure can influence the overall positivity or negativity of individuals' attitudes, aggregating across numerous stimuli).

Additionally, because defense motivation and initial attitudes interact to predict sequential exposure decisions for single attitude-objects (see Study 5), it is possible that generalized forms of these same constructs predict individual differences in sequential exposure habits. To examine this possibility, participants completed individual difference measures of defense motivation (defensive confidence; Albarracin & Mitchell, 2004) and attitude-object expectations (optimism; Scheier, Carver, & Bridges, 1994). The measure of sequential exposure habits was regressed onto these variables and their interaction to examine whether individual differences in defensiveness and expectations predicted consistent approach toward positive or negative information first. Therefore, Study 8 investigated whether individual differences exist in the tendency to approach positive or negative information first,

whether these differences are predicted by individual differences in defense motivation and stimulus expectations, and whether sequential exposure decisions are related to dispositional attitudes.

9.1 Method

9.1.1 Pretest: Selecting attitude-objects for the sequential exposure habit scale. The measure of sequential exposure habit in Study 1 used three items and had moderate reliability (α = .56). Using the Spearman-Brown prediction formula (Allen & Yen, 1979) and the reliability estimate from Study 1, doubling the measure length to six items would result in reliability of .72 and quadrupling it to 12 items would result in reliability of .84. Therefore, the Study 8 measure of sequential exposure habit was increased to 12 decisions in an attempt to ensure good scale reliability. Further, the scale was constructed to include a variety of attitude-objects – six were consumer products (three positive, three negative) and six were social-political issues (three positive, three negative). This allowed for tests of whether sequential exposure habit is consistent across attitude-object domains and attitude-object valence. Finally, the attitude-objects were all fictitious because this allowed for a test of whether sequential exposure causally contributes to dispositional attitudes.

The six fictitious consumer products were drawn from previous research (Study 1 in the present research and Hepler & Albarracin, 2013a). Three were normatively positive and three were normatively negative (see Table 16). To select social-political attitude-objects with an appropriate range of valence, an independent group of participants (*N* = 50) was recruited online using Amazon's Mechanical Turk website and was paid $0.10 to complete a pretest. Because some of the attitude-objects refer to fictitious political causes and legislation, the sample was restricted to MTurk users in United States only. The age of respondents ranged from 18 to 70 (*M* = 29.57, *SD* = 9.02). In this sample, 46% of respondents were female, 44% had a bachelor's degree or higher, and the modal income category was $0 - $24,999. Participants reported their attitudes toward 20 fictitious attitude-objects using a single-item scale from 1 (*strongly dislike*) to 6 (*strongly like*) (see Appendix H for the full list of pretest items). Of the 20 items,

four had means significantly below and seven had means significantly above the scale midpoint of 3.5. Three items were randomly selected from the negative group and three from the positive group to be used in Study 8 (see Table 16). For each fictitious consumer product, one positive and one negative fictitious review were created. For each fictitious social-political topic, one positive and one negative opinion were created by modifying pro and con arguments for similar issues listed on the website procon.org (all message stimuli are listed in Appendix I).

9.1.2 Power analysis. To determine an appropriate sample size for Study 8, I conducted a power analysis. The critical effect for Study 8 is the hypothesized correlation between dispositional attitudes and sequential exposure habits, and the power analysis will therefore be used to determine the sample size required to detect this effect. In Study 1, sequential exposure habits and dispositional attitudes were correlated at $r = .20$. Using the parameters of $r = .20$, $\alpha = .05$ and power = .80, a two-tailed test for a correlation requires a total sample size of at least $N = 193$ (calculated using the G*Power program; Faul et al., 2007).

9.1.3 Participants. Participants ($N = 200$) were recruited online using Amazon's Mechanical Turk website and were paid $0.50 to complete the study. Recruitment was restricted to participants located in the United States only (see rationale above). The age of respondents ranged from 18 to 70 ($M = 34.87$, $SD = 12.92$). In this sample, 59% of respondents were female, 56% had a bachelor's degree or higher, and the modal income category was $25,000 - $49,999. The sample was 67% Caucasian, 13% Non-Indian Asian, 11% Indian, and 9% other.

9.1.4 Procedure. Participants completed a "consumer opinion survey" containing the six fictitious consumer products and a "voter opinion survey" containing the six fictitious social-political topics. The surveys were presented in random order, which did not affect the results. Within each survey, participants were presented with the attitude-objects in randomized order. For each attitude-object, participants were first presented with the object's name and were asked to report their initial

attitude using two 7-point semantic differential scales ("[This attitude-object] is something that…" *I dislike/I like, is bad/is good*). Next, participants were told that they would read two reviews for each product or issue, one of which was "5-star (positive)" / "An opinion in support ('pro')" and one of which was "1-star (negative)" / "An opinions in opposition ('con')". Participants were told that although they would read both reviews, they could choose the order in which they would read them. Participants then read the reviews in their chosen order and subsequently reported their attitudes using two 7-point semantic differential scales with different anchors from time 1 ("[This attitude-object] is something that…" *is negative/is positive, is unfavorable/is favorable*). After completing both surveys, participants completed the DAM to measure dispositional attitudes, the Life Orientation Test revised (LOT-r) to measure optimism (Scheier et al., 1994), and an individual difference measure of defensive confidence (Albarracin & Mitchell, 2004). The defensive confidence scale is a 12-item measure assessing the belief that one can successfully defend one's attitudes against persuasion. Low (high) defensive confidence is associated with a strong (weak) desire to defend one's attitudes, and it has been associated with the use (non-use) of defense-promoting strategies such as the congeniality bias (e.g., Study 3 of Albarracin & Mitchell, 2004). The survey included the same "attention check" questions used in Study 1. Nine respondents failed at least two attention check questions. Their submissions were rejected, and their data were not recorded. Therefore the sample size of 200 respondents does not include those who failed this manipulation check.

9.2 Results and Discussion

9.2.1 Calculating measures. Initial attitudes, final attitudes, and sequential exposure decisions were calculated as in Studies 1-7, and descriptive statistics for these measures appear in Table 17. Descriptive statistics for the individual difference measures appear in Table 18. Each sequential exposure decision was coded as 0 (1) if participants chose to read the negative (positive) information first. The measure of sequential exposure habit was calculated by summing individual sequential

exposure decisions, thus producing an index ranging from 0-12. Subscales for (a) consumer products, (b) social-political issues, (c) positive attitude-objects, and (d) negative attitude-objects were calculated in analogous ways, such that they could range from 0-6.

9.2.2 Initial analyses. Unlike Studies 1-6, initial and final attitudes were uncorrelated with sequential exposure decisions, except for one attitude-object (Table 17). Unsurprisingly then, the indirect effect of initial attitudes on final attitudes through sequential exposure order was not significant for any attitude-object. Thus, Study 8 failed to replicate a number of results from Studies 1-6, including the presence of the sequential exposure bias for individual attitude-objects.

The habit index and subscales were internally consistent, and the subscales were strongly correlated with one another (Table 18). The habit index displayed a multimodal distribution, HDS = .06, $p < .001$. Three distinct clusters of response patterns were apparent in the frequency distribution for this variable (Figure 4). The first group always or almost always (index = 0 or 1) approached negative information first. The second group (index = 2 to 11) demonstrated variability in sequential exposure decisions across attitude-objects. The third group always (index = 12) approached positive information first. Very similar patterns were observed for each strategy subscale. Overall then, there appears to be substantial individual variation in sequential exposure habits, and the three identified clusters may represent unique response strategies. Consequently, in the following analyses the relation between sequential exposure habits and other variables was examined using sequential exposure habits as a continuous variable (a sum from 0-12) and as a categorical variable in which participants were split into groups based on the clusters identified in the frequency distribution (Group 1: Index = 0-1. Group 2: Index= 2-11; Group 3: Index = 12).

9.2.3 Defensive confidence and optimism as antecedents of sequential exposure habits. The continuous index of sequential exposure habits was regressed onto defensive confidence, optimism, and

their interaction. None of the predictors were significant, *p*s > .10. A logistic regression to predict the categorical index also produced non-significant results, *p*s > .10. The subscale results were similar.

9.2.4 Dispositional attitudes as a consequence of sequential exposure habits. Participants' DAM scores were regressed onto the continuous index of sequential exposure habits, and the regression coefficient was not significant, β = .01, *p* = .90. A one-way analysis of variance (ANOVA) predicting DAM from the categorical index was also not significant, *F*(2, 198) = 2.33, *p* = .10. The subscale results were similar.

9.2.5 Biased attitudes as a consequence of sequential exposure habits. Participants' final attitudes toward the twelve attitude-objects used in this study were averaged together to form a measure of dispositional attitudes based on these particular items (α = .41). Average final attitudes were regressed onto the continuous index, and the regression coefficient was not significant, β = -.04, *p* = .58. A one-way ANOVA predicting average final attitudes from the categorical index was also not significant, *F*(2, 199) = 2.56, *p* = .08. The subscale results were similar.

9.2.6 Conclusions. Although Study 8 provided mixed results, it demonstrated that individuals had relatively consistent preferences for approaching positive or negative information first. That is, within-subject between-stimulus sequential exposure decisions were internally consistent with respect to the valence approached first versus second, and sequential exposure decisions were strongly positively correlated across attitude-object domain (consumer products versus social issues) and normative valence of the stimuli (negative versus positive). However, Study 8 failed to detect the presence of the sequential exposure bias, such that initial attitudes and sequential exposure decisions were uncorrelated for 11 of 12 attitude-objects used in the study. This occurred despite the fact that one of those attitude-objects (the microwave product) has repeatedly been used to demonstrate this relation (Studies 1-4). Study 8 also failed to detect a correlation between dispositional attitudes and a

measure of sequential exposure habit, despite the fact that Study 1 found a significant association between these two variables.

The measure of sequential exposure habit used in Study 8 would appear to be better than the measure used in Study 1. The Study 8 measure contained 12 sequential exposure decisions, whereas the Study 1 measure contained three. The Study 8 measure had $\alpha = .86$, whereas the Study 1 measure had $\alpha = .56$. The Study 8 measure deliberately sampled a variety of attitude-objects, including positive and negative consumer products and social issues, whereas the Study 1 measure contained only consumer products, two of which were positive and one of which was negative. Despite the apparent superiority of the Study 8 measure, the results of Study 1 may nevertheless be more trustworthy. Specifically, the sequential exposure bias that was observed in Studies 1-6 was not observed in Study 8. Instead, only one attitude-object displayed a relation between initial attitudes and sequential exposure decisions. This lack of correlation could have occurred because (a) previous studies demonstrating the correlation were false positives (type one errors), (b) the present study is a false negative (type two error), or (c) a methodological difference between the present study and previous studies introduced a moderator that influenced the relation between initial attitudes and sequential exposure decisions.

Given that the sequential exposure bias was found in five out of the five previous attempts (Studies 1, 2, 4, 5, and 6; Study 3 manipulated exposure order to intentionally cause initial attitudes and exposure order to be uncorrelated), it is unlikely to be the case that Study 8 captured the true effect whereas the previous five studies were all false positives. It also seems unlikely that the results of Study 8 were simply due to a few false negatives. Specifically, the sample-size weighted mean correlation between initial attitudes and sequential exposure decisions derived from Studies 1, 2, 4, 5, and 6 is $r = .20$. Thus, Study 8 had a power of over .80 to detect this effect for each of the 12 attitude-objects used in the study, yielding an expected value of 9.6 significant correlations. The stark contrast between the

number of observed significant correlations and the number of expected significant correlations is unlikely to have occurred by chance.

Via elimination, the remaining explanation for the discrepancy between Study 8 and previous studies is a methodological difference. Study 8 differed from previous studies in a few important ways. First, Study 8 used 12 attitude-objects, whereas Studies 1-6 used one (Studies 2-6) or three (Study 1) attitude-objects. Second, Study 8 included a mix of fictitious consumer products and fictitious social-political issues, whereas previous studies used fictitious consumer products (Studies 1-4) or real social-political issues (Studies 5-6). Third, Study 8 presented participants with two messages per object, whereas Studies 1-6 provided participants with six messages per object. Fourth, Study 8 required participants to report their attitudes using two semantic differential items, whereas Studies 1-6 used four items. It is unlikely that the type of attitude-objects used caused the observed difference between studies because a few items (the microwave, coffee, and cigarette products) were used in Studies 1-4 and demonstrated the sequential exposure bias in those studies but not in Study 8. It is also unlikely that the observed differences were due to the number of reviews per object or the number of semantic differential items used, as there is no theoretical reason why these differences would influence sequential exposure decisions.

However, there is a potential theoretical explanation for why the increased number of attitude-objects included in the scale may have moderated the results. Specifically, participants may have felt overburdened by the requirement of reading about and evaluating 12 different items, and this may have decreased their motivation to do the task. When individuals feel that a task is too difficult in relation to anticipated rewards, they tend to decrease the effort they exert on the task (Wright & Gendolla, 2012). If participants decreased their effort, they may have made sequential exposure decisions with little thought, perhaps failing to consider their initial attitudes when making these decisions. In prior research on information search behaviors, high task difficulty (manipulated via cognitive load) has been shown to

eliminate the congeniality bias, such that the preference for congenial over uncongenial information is eliminated when participants' cognitive resources are strained (Study 3 of Fischer, Jonas, Frey, & Schulz-Hardt, 2005). Thus, straining individuals' cognitive resources due to difficult or burdensome tasks may eliminate the sequential exposure bias in the same way that it eliminates the congeniality bias. Although necessarily speculative, the most plausible reason for the discrepancy between Study 8 and Studies 1-6 would appear to be the overly burdensome demand of reading about and evaluating 12 attitude-objects for a relatively small payment on MTurk. Future research could test this hypothesis by replicating the study with fewer attitude-objects or with a much higher payment.

The failure of Study 8 to replicate the sequential exposure bias, coupled with the fact that this failure may be the result of a methodological artifact, casts doubt on the veracity of the other Study 8 results including the estimate of the correlation between sequential exposure habits and dispositional attitudes. Thus, despite the fact that Study 8 used a more reliable measure of sequential exposure habits than Study 1, these other considerations suggest that the estimate of the correlation derived from Study 1 may be more valid. Further research will be required to resolve these issues, and until then the relation between sequential exposure and dispositional attitudes remains tentative.

CHAPTER 10: GENERAL DISCUSSION

The present research introduced the sequential exposure bias, defined as a tendency to approach congenial before uncongenial information when searching for information. In Study 1, participants were more likely to approach congenial before uncongenial information when learning about three separate stimuli, and information exposure order influenced participants' final attitudes toward those stimuli via primacy effects. Thus, participants' final attitudes were biased in the direction of their initial attitudes, due in part to the sequential exposure decisions that participants made. Study 1 also provided evidence that people are consistent in their choice of approaching positive or negative information first, and that this consistency is related to dispositional attitudes. Specifically, people who tended to approach positive (negative) information before negative (positive) information across a variety of stimuli tended to have more positive (negative) dispositional attitudes. Study 2 demonstrated that initial attitudes causally influence sequential exposure decisions, and Study 3 demonstrated that sequential exposure decisions causally influence final attitudes. In Study 4, participants' resistance to information approached last was reduced by requiring them to list more thoughts in response to the information approached last relative to the information approached first, and this reduction in resistance eliminated the downstream attitudinal consequences of the sequential exposure bias. In Study 5, participants who were manipulated to have a high defense motivation showed a stronger preference for approaching congenial information first (relative to control participants), demonstrating that defense motivation moderates the use of the sequential exposure bias. Although Study 6 attempted to explore accuracy motivation as a moderator, the manipulation failed, and thus the moderating status of accuracy motivation is currently unknown. Study 7 demonstrated that the preference for approaching positive or negative information first is a relatively stable individual difference over short time intervals. Finally, Study 8 attempted to replicate the Study 1 findings that dispositional attitudes are related to sequential exposure decisions while using an improved index of

sequential exposure habits. Although participants made consistent decisions across a number of sequential exposure choices (replicating Study 1), these habits were unrelated to dispositional attitudes. Overall, the present research demonstrated that when people approach two-sided information, they tend to approach congenial before uncongenial information. This bias is partly driven by the desire to defend one's attitudes, and under the right conditions it can successfully defend attitudes against the influence of uncongenial information.

10.1 Limitations

Despite the knowledge gained in the present research, there are a few limitations. First, the accuracy motivation manipulation used in Study 6 did not work despite the fact that previous research has successfully used similar manipulations (Canon, 1964; Freedman, 1965). It is therefore not currently possible to say whether accuracy motivation moderates the sequential exposure bias despite strong theoretical reasons to hypothesize this effect. Future research should explore the influence of accuracy motivation on sequential exposure decisions with more successful manipulations (see discussion in Study 6 for some potential manipulations).

A second limitation is that although the sequential exposure bias was shown to have downstream effects on final attitudes for novel attitude-objects (Studies 1-4), these downstream effects were not observed for pre-existing attitude-objects (Studies 5-6). It is important to note that the pre-existing attitude-objects used in the present research were unusual because they displayed strongly polarized, bimodal distributions. As a result, these attitudes are not representative of most pre-existing attitudes – in the pretest used to select these attitude-objects, only four of 43 pre-existing attitudes displayed such extreme, polarized distributions. Extreme attitudes tend to be stronger than non-extreme attitudes and are therefore more difficult to change (Albarracin & Vargas, 2010; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993). Thus, it is possible that exposure order failed to influence these attitudes because the messages used in the present studies were simply too weak to influence

extreme attitudes. It is also plausible that these extreme attitudes could be influenced by the sequential exposure bias if stronger messages were used (Petty & Krosnick, 1995). Therefore, it is currently unclear whether the lack of relation between the sequential exposure bias and final attitudes for these particular attitude-objects occurred because they were pre-existing attitudes or due to their unusually extreme nature.

A third limitation is that the present research found mixed evidence for a relation between sequential exposure decisions and dispositional attitudes. Although this relation was found in Study 1, it was not replicated in Study 8. As discussed, although the measure of sequential exposure habits used in Study 8 seemed to be superior to the measure used in Study 1, there are reasons to doubt the Study 8 results. Specifically, Study 8 failed to replicate the strong and robust association between initial attitudes and sequential exposure decisions for 11 of the 12 attitude-objects used. Given this failure to replicate a finding that occurred in five previous studies, it is possible that a methodological feature of Study 8 moderated these relations, rendering the results incomparable with the previous studies. Specifically, participants may have been overburdened by the requirement of reading about and evaluating 12 separate attitude-objects, and this may have caused them to disengage from the task. Similar effects have been observed for other information search biases – specifically, high task difficulty (induced via cognitive load) has been shown to eliminate the congeniality bias (Fischer et al., 2005). As this explanation is post-hoc and speculative, future research will be required to determine whether task difficulty moderates the association between initial attitudes and sequential exposure decisions, and whether sequential exposure decisions are related to dispositional attitudes.

10.2 Relations with Relevant Theories

10.2.1 Relations with order effects in persuasion. Prior order effects research used paradigms in which message recipients were presented with messages in an order determined by someone else (e.g., the researcher). The present research is the first to examine how message recipients organize two-

sided messages for themselves, and whether this organization influences judgment processes. Across all studies in which sequential exposure order influenced final attitudes, a primacy effect was found whereby the information approached first was more related to final attitudes than the information approached last. However, primacy effects only occur to the extent that the information approached first is processed thoroughly and is then used to interpret or counter-argue the information that is approached later (Haugtvedt & Wegener, 1994). If message recipients have low levels of motivation or ability to attend to the messages, recency effects are more likely than primacy effects (Haugtvedt & Wegener, 1994). Because two-sided information tends to elicit high elaboration (Jonas et al., 1997) and because message recipients are probably highly motivated when they actively search for information, primacy effects may be common during self-directed information searches. However, if message recipients are not particularly motivated or are distracted while searching for information, it is possible that primacy effects could be eliminated or that recency effects could emerge instead.

Further, primacy effects occur under high elaboration conditions when information is organized in discrete blocks (sometimes referred to as “chunks”), as was done in the present studies. When information is presented in a stream that changes back and forth between opposing positions, high elaboration yields recency effects because message recipients wait to form judgments until the last piece of information in the stream has been processed (Petty et al., 2001). Therefore, allowing message recipients to cycle back-and-forth between positive and negative information (e.g., positive message, negative message, positive message, negative message) may reverse the observed relation between sequential exposure decisions and final attitudes. If so, it would be interesting to examine whether individuals’ sequential exposure decisions would change based on information format. That is, to promote attitude defense when information will be received in an alternating stream format, individuals may approach uncongenial information first. However, if individuals still approach congenial information first under these conditions, this strategy would become counter-productive and would undermine the

goal of attitude defense (and potentially promote attitude accuracy). Thus, initially approaching congenial information may not always be an effective attitude defense strategy.

Finally, research has generally used strong arguments to examine order effects in persuasion (e.g., Haugtvedt & Wegener, 1994; Petty et al., 2001), and the present research maintained this tradition. Because order effects are theorized to be dependent on elaboration (i.e., elaboration of initial information makes message recipients more resistant to later information), it is plausible that the effects of message order could be eliminated or reversed if weak arguments were used instead of strong arguments. That is, if message recipients elaborated on an initial set of messages that were weak, they may counter-argue those messages and thus develop attitudes opposite to the messages' direction (Petty & Cacioppo, 1986). The potential for message strength to moderate order effects is not unique to the present research or the sequential exposure bias, but rather represents a relatively unexamined moderator for order effects in general. Therefore, message strength represents another factor that may need to be considered when determining whether initially approaching congenial information will actually promote attitude defense.

10.2.2 Relations with motivated cognition. This is the first research to establish that order effects can be used as an effective motivated cognition strategy. Although the existence of order effects was established nearly a century ago (Lund, 1925), the present research is the first demonstration that people strategically use order effects to arrive at desired conclusions. This is noteworthy because it identifies a previously overlooked use for the phenomenon of order effects. Further, it demonstrates that information processing phenomena that typically occur for non-motivational reasons can be strategically engaged to pursue motivational goals. In other words, although order effects can be conceptualized as an unintended artifact of the information processing system, they can also function as an intentional feature used to help individuals arrive at desired conclusions. Overall then, the sequential

exposure bias can be thought of as a newly identified motivated cognition strategy that individuals use to defend prior attitudes.

10.3 Practical Applications: Conducting an Information Search

The present research has several practical applications for individuals who are conducting information searches. First, there is no single answer to the question of how an information search should be conducted because information searches may be motivated by different goals. Specifically, individuals looking for information to confirm and defend a valued belief should adopt different strategies than individuals looking to form accurate, valid beliefs that result in objectively good judgments. Normatively, researchers view accuracy as a desirable goal and defense as an undesirable goal – in this vein, numerous studies have attempted to eliminate selective exposure and promote equitable approach toward congenial and uncongenial information alike (e.g., Fischer & Greitemeyer, 2010; Hart et al., 2009; Schwind & Buder, 2012; Schwind, Buder, Cress, & Hesse, 2012; Young, Tiedens, Jung, & Tsai, 2011). In contrast, researchers do not generally attempt to strengthen biases in information seeking, unless the purpose is to understand moderators for theoretical purposes. Although there are good reasons to promote accuracy motivation during information searches (i.e., to increase good decision making; Kray & Galinsky, 2003; Greitemeyer & Schulz-Hardt, 2003; Sweeny et al., 2010), defense motivation can theoretically be beneficial as well. For example, a patient who just underwent heart surgery will not benefit from learning that a non-surgical alternative was an equally good treatment option, and indeed this realization may actually cause harm by inflicting unnecessary stress, embarrassment, and remorse for a decision that cannot be altered and that has little chance of being repeated. In contrast, the patient may benefit emotionally by confirming their belief that they made a good choice by having a life-altering operation. Thus, it is useful to provide information search recommendations that facilitate either defense or accuracy motivations because both motivations occur and both motivations can theoretically be beneficial.

In the context of the sequential exposure bias, individuals who are attempting to form accurate attitudes should avoid approaching congenial information before uncongenial information because this order has the largest probability of yielding biased attitudes (see Studies 1-4). Further, if individuals do approach congenial information first, spending relatively more time thinking about the uncongenial information that comes last may help eliminate the biasing effect of approach order (see Study 4). In contrast, individuals who are attempting to confirm or defend their attitudes should approach congenial information first and should avoid elaborating on the uncongenial information more so than the congenial information. These strategies could likely be combined with other defense promoting strategies, such as the congeniality bias. For example, to form an accurate attitude, individuals could approach uncongenial information first followed by an equal amount of congenial information, whereas to defend an attitude, individuals could approach a large amount of congenial information first followed by a lesser amount of uncongenial information second.

The present research also has practical applications for the design of information search interfaces (Wildemuth, 2006). Many practitioners (e.g., web designers) attempt to create information search interfaces that facilitate specific search goals (e.g., Rose & Levinson, 2004), and knowledge of the sequential exposure bias can inform these attempts. Many websites (e.g., yelp.com, rottentomatoes.com) strive to help consumers make informed decisions and to facilitate accurate judgments. To facilitate these objectives, these sites could disable information search options that allow users to sort information (e.g., user reviews) by valence. Instead, sorting information from most recent to oldest as the default setting would avoid some issues related to the sequential exposure bias. On the other hand, many companies list reviews for their own products on their own websites. In these cases, the interface designer's objective is to increase product sales rather than promote accurate product judgments. To increase attitudes toward products (thus increasing the potential for an affirmative

purchase decision), these search interfaces could be designed to sort reviews from most to least positive as the default setting and to not provide an option for sorting reviews from most to least negative.

In sum, the present research has practical applications both for individuals who are conducting information searches, as well as for individuals who are helping others conduct information searches (e.g., by designing information search interfaces). Importantly, the recommendations that one would make based on this research critically depend on the motivations of the information seekers or information search creators.

10.4 Directions for Future Research

10.4.1 New paradigms. The present research used a highly controlled information search paradigm in which participants were required to approach all congenial information before or after all uncongenial information. This paradigm mimics many real life situations very well. For example, individuals may naturally block information for themselves either for practical reasons (e.g., it may ease information processing burdens to read all messages of one type before proceeding to messages of a different type) or due to structural feature of the information search (e.g., information search interfaces may separate positive and negative messages). Additionally, sometimes only one piece of congenial information and one piece of uncongenial information will be available, and thus a simple before versus after decision is relevant. However, it is also possible that some individuals prefer to alternate between contrasting pieces of information or to adopt some other strategy, such as reading some congenial messages, followed by all uncongenial messages, and then the remaining congenial messages. The current paradigm is unable to address questions concerning alternate search strategies such as these. Future research could fruitfully explore alternate strategies using a modified sequential exposure paradigm, such as having participants rank the order in which they want to approach multiple pieces of information (e.g., from the first piece of information though the tenth). This method would be similar to selective exposure paradigms in which participants rank order information from the most desired to

least desired information rather than making yes/no approach decisions (e.g., Brannon, Tagler, & Eagly, 2007). However, the current paradigm is useful because it provides a clean assessment of whether individuals prefer to approach congenial before or after uncongenial information, and it also mimics a variety of common and important real life situations.

10.4.2 Interaction with other defense-promoting strategies. The sequential exposure bias represents one strategy that individuals can use to defend their attitudes, and it would be interesting to examine how the use of this strategy is related to the use of other defense strategies. Because individuals often pursue goals flexibly by whatever means is most accessible or applicable (e.g., Fishbach, Dhar, & Zhang, 2006), the sequential exposure bias may demonstrate an inverse relation with other defense-promoting strategies. For example, if individuals are allowed to approach as much information of whatever type they desire, they may use the congeniality bias and avoid uncongenial information altogether, thus obviating the need for the sequential exposure bias. Similarly, if people were forced to read at least some congenial and some uncongenial information, the use of the sequential exposure bias may increase as the amount of uncongenial information approached increases. Oppositely, use of the sequential exposure bias may instead be positively correlated with the use of other defense-promoting strategies, such that people use all of the tools at their disposal. Of relevance, research on “the blemishing effect” (Ein-Gar, Shiv, & Tormala, 2012) has demonstrated that consumers exposed to a small amount of negative information after being exposed to a large amount of positive information form more positive attitudes toward products than consumers only exposed to the positive information. Thus, attitude defense may actually be best accomplished through the simultaneous use of multiple defense strategies rather than through the exclusive use of one strategy. That is, attitude defense may be more successful if the congeniality bias and sequential exposure bias are combined rather than used in isolation. The nature of the interrelations among defense-promoting strategies is an interesting question and a promising avenue for future research.

10.4.3 Moderation by additional motivations. In addition to the classic information search motivations of defense and accuracy (Eagly & Chaiken, 1993; Hart et al., 2009), it is likely that additional motivations moderate the sequential exposure bias. One promising example is general action motivation, defined as a desire to "be active" without concern for what specific actions are undertaken (Albarracin et al., 2008; Albarracin, Hepler, & Tannenbaum, 2011; McCulloch, Li, Hong & Albarracin, 2012; Tannenbaum, Hepler, & Albarracin, 2011). When this motivation is present, people engage their environment in whatever manner is afforded to them, often pursuing seemingly unrelated or contradictory behaviors such as increased exercise (Hepler, Albarracin, McCulloch, & Noguchi, 2012), increased food consumption (Albarracin et al., 2008; Albarracin, Wang, & Leeper, 2009), increased performance on cognitive tasks (Albarracin et al., 2008; Albarracin & Hart, 2011; Gendolla & Silvestrini, 2010; Silvestrini & Gendolla, 2013), increased political participation (Noguchi, Handley, & Albarracin, 2011), and increased impulsivity (Hepler & Albarracin, 2013b; Hepler, Wang, & Albarracin, 2012). Of particular relevance, general action motivation prepares individuals for action by increasing the accessibility of attitudes that are relevant for one's current situation, and this increased accessibility triggers resistance to uncongenial information (Albarracin & Handley, 2011). Consequently, prior research has demonstrated that general action motivation increases the use of the congeniality bias as a means of attitude defense (Hart & Albarracin, 2012). It therefore seems likely that when people are motivated to be active, they may also display an increased sequential exposure bias, particularly because this is an attitude defense strategy that can be employed while still pursuing high levels of activity (i.e., while still approaching all of the available information). Thus, future work should examine general action motivation as a moderator for the sequential exposure bias.

10.5 Concluding Remarks

In conclusion, the present research identified a sequential exposure bias in information seeking behavior, such that individuals are more likely to approach congenial information before uncongenial

information. This bias has the potential to influence attitudes by making them relatively resistant to uncongenial information, and individuals are more likely to use this bias when they are motivated to defend their attitudes. Consequently, the sequential exposure bias represents a motivated cognition strategy that individuals sometimes use to defend their attitudes against potentially threatening information.

Table 1. Predicted relations between chronic defense motivation, chronic stimulus expectations, sequential exposure strategies, and dispositional attitudes.

Defense motivation	Stimulus expectations	Sequential exposure strategies	Dispositional Attitude
High	Positive	Approach positive information first	Positive
High	Negative	Approach negative information first	Negative
Low	Positive	No consistent strategy	Moderate
Low	Negative	No consistent strategy	Moderate

Notes: "No consistent strategy" indicates that individuals' sequential exposure strategies are predicted to be unrelated to their chronic defense motivation and chronic stimulus expectations, not that their individual exposure choices are unrelated to any psychological antecedents.

Table 2. Descriptive statistics and correlations among scales in Study 1.

Stimulus	Mean	SD	Initial attitude	Sequential Exposure	Final attitude
Cigarettes					
Initial attitude	2.96	1.95	(.98)	.25**	.81**
Sequential exposure	.45	.50		-	.32**
Final attitude	2.80	2.07			(.98)
Coffee					
Initial attitude	5.37	1.24	(.93)	.18**	.53**
Sequential exposure	.65	.48		-	.31**
Final attitude	4.89	1.83			(.97)
Microwave					
Initial attitude	5.36	1.17	(.91)	.18**	.49**
Sequential exposure	.68	.47		-	.25**
Final attitude	4.77	1.70			(.97)

Notes: Correlations are among measures used for each stimulus, not between stimuli. Cronbach's alphas are on the correlation diagonals. Sequential exposure is 0 (1) if participants approached negative (positive) reviews first. Dash indicates that a variable was not measured. * $p < .05$. ** $p < .01$.

Table 3. Path coefficients and indirect effects for the mediation model analyzed in Study 1.

	a		**b**		**c**		**c'**		**Indirect effect**	
	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	Effect	95% CI
Cigarette	.06 (.01)	< .001	.51 (.14)	< .001	.86 (.04)	< .001	.82 (.04)	< .001	.03	[.01, .06]
Coffee	.07 (.02)	.002	.84 (.19)	< .001	.79 (.07)	< .001	.73 (.07)	< .001	.06	[.02, .12]
Microwave	.07 (.02)	.002	.60 (.19)	.001	.70 (.07)	< .001	.66 (.07)	< .001	.04	[.01, .09]

Notes: Coefficients a through c' refer to path coefficients in Figure 2. Mediation models were analyzed separately for each stimulus.

Table 4. Descriptive statistics and correlations among scales in Study 2.

Stimulus	Mean	SD	Initial attitude	Sequential Exposure	Final attitude
Initial attitude	-	-	-	.17*	.33**
Sequential exposure	.70	.46		-	.31**
Final attitude	4.96	1.54			(.95)

Notes: Cronbach's alphas are on the correlation diagonals. Initial attitude is 0 (1) if participants were told they would dislike (like) the product based on the brand preference survey. Sequential exposure is 0 (1) if participants approached negative (positive) reviews first. Dash indicates that a variable was not measured. * $p < .05$. ** $p < .01$.

Table 5. Path coefficients and indirect effect for the mediation model analyzed in Study 2.

a		**b**		**c**		**c'**		**Indirect effect**	
β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	Effect	95% CI
.16 (.06)	.02	.86 (.22)	< .001	1.01 (.21)	< .001	.87 (.20)	< .001	.13	[.03, .31]

Notes: Coefficients a through c' refer to path coefficients in Figure 2.

Table 6. Descriptive statistics and correlations among scales in Study 3.

Stimulus	Mean	SD	Initial attitude	Sequential exposure	Final attitude
Initial attitude	5.37	1.15	(.90)	.07	.48**
Sequential exposure	.50	.50		-	.23**
Final attitude	5.32	1.29			(.94)

Notes: Cronbach's alphas are on the correlation diagonals. Info order is 0 (1) if participants were assigned to read negative (positive) reviews first. Dash indicates that a variable was not measured. * $p < .05$. ** $p < .01$.

Table 7. Path coefficients and indirect effect for the mediation model analyzed in Study 3.

a		**b**		**c**		**c'**		**Indirect effect**	
β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	Effect	95% CI
.03 (.03)	.24	.50 (.13)	< .001	.54 (.06)	< .001	.53 (.06)	< .001	.01	[-.01, .04]

Notes: Coefficients a through c' refer to path coefficients in Figure 2.

Table 8. Descriptive statistics and correlations among scales in Studies 1-4 for the microwave stimulus.

	Mean	SD	Initial attitude	Sequential exposure	Final attitude
Study 1: Microwave					
Initial attitude	5.36	1.17	(.91)	.18**	.49**
Sequential exposure	.68	.47		-	.25**
Final attitude	4.77	1.70			(.97)
Study 2					
Initial attitude	-	-	-	.17*	.33**
Sequential exposure	.70	.46		-	.31**
Final attitude	4.96	1.54			(.95)
Study 3					
Initial attitude	5.37	1.15	(.90)	.07	.48**
Sequential exposure	.50	.50		-	.23**
Final attitude	5.32	1.29			(.94)
Study 4: 3-then-1					
Initial attitude	5.33	1.32	(.95)	.26**	.51**
Sequential exposure	.66	.48		-	.38**
Final attitude	4.72	1.66			(.96)
Study 4: 1-then-3					
Initial attitude	5.32	1.23	(.93)	.24**	.50**
Sequential exposure	.61	.49		-	-.01
Final attitude	4.88	1.56			(.96)

Notes: Results from Studies 1-3 are displayed for comparison purposes. Cronbach's alphas are on the correlation diagonals. Sequential exposure is 0 (1) if participants approached negative (positive) reviews first. Dash indicates that a variable was not measured. In the 3-then-1 condition, participants provided three (one) thoughts for each review presented first (second). The 1-then-3 condition, participants provided three (one) thoughts for each review presented second (first). * $p < .05$. ** $p < .01$.

Table 9. Path coefficients and indirect effect for the mediation model for the microwave product in Studies 1-4.

	a		b		c		c'		Indirect effect	
	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	Effect	95% CI
Study 1	.07 (.02)	.002	.60 (.19)	.001	.70 (.07)	< .001	.66 (.07)	< .001	.04	[.01, .09]
Study 2	.16 (.06)	.02	.86 (.22)	< .001	1.01 (.21)	< .001	.87 (.20)	< .001	.13	[.03, .31]
Study 3	.03 (.03)	.24	.50 (.13)	< .001	.54 (.06)	< .001	.53 (.06)	< .001	.01	[-.01, .04]
Study 4: 3-then-1	.09 (.03)	.002	.95 (.24)	< .001	.64 (.09)	< .001	.55 (.09)	< .001	.09	[.03, .18]
Study 4: 1-then-3	.10 (.03)	.003	-.43 (.23)	.07	.63 (.09)	< .001	.67 (.09)	< .001	-.04	[-.10, -.01]

Notes: Results from Studies 1-3 are displayed for comparison purposes. Coefficients a through c' refer to path coefficients in Figure 2. In the 3-then-1 condition, participants provided three (one) thoughts for each review presented first (second). The 1-then-3 condition, participants provided three (one) thoughts for each review presented second (first).

Table 10. Descriptive statistics and correlations among scales in Study 5.

	Mean	SD	Initial attitude	Sequential exposure	Final attitude
Essay condition					
Initial attitude	4.30	2.20	(.98)	.29**	.94**
Sequential exposure	.42	.49		-	.26**
Final attitude	4.28	2.23			(.98)
Control condition					
Initial attitude	4.59	2.16	(.98)	.13*	.89**
Sequential exposure	.41	.49		-	.10†
Final attitude	4.56	2.16			(.99)

Notes: Cronbach's alphas are on the correlation diagonals. Sequential exposure is 0 (1) if participants approached negative (positive) reviews first. Dash indicates that a variable was not measured. † $p < .10$. * $p < .05$. ** $p < .01$.

Table 11. Path coefficients and indirect effect for the mediation model in Study 5.

	a		b		c		c'		Indirect effect	
	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	Effect	95% CI
Essay condition	.07 (.01)	< .001	-.08 (.09)	.40	.95 (.02)	<.001	.96 (.02)	< .001	.00	[-.02, .01]
Control condition	.03 (.01)	.01	-.05 (.12)	.65	.89 (.03)	< .001	.89 (.03)	< .001	.00	[-.01, .00]

Notes: Coefficients a through c' refer to path coefficients in Figure 2.

Table 12. Descriptive statistics and correlations among scales in Study 5b (Study 5 replication).

	Mean	SD	Initial attitude	Sequential exposure	Final attitude
Essay condition					
Initial attitude	4.37	2.21	(.98)	.25**	.93**
Sequential exposure	.42	.49		-	.23**
Final attitude	4.35	2.21			(.98)
Control condition					
Initial attitude	4.48	2.26	(.98)	.13*	.94**
Sequential exposure	.38	.49		-	.13*
Final attitude	4.45	2.31			(.98)

Notes: Cronbach's alphas are on the correlation diagonals. Sequential exposure is 0 (1) if participants approached negative (positive) reviews first. Dash indicates that a variable was not measured. * $p < .05$. ** $p < .01$.

Table 13. Path coefficients and indirect effect for the mediation model in Study 5b (Study 5 replication).

	a		**b**		**c**		**c'**		**Indirect effect**	
	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	Effect	95% CI
Essay condition	.06 (.01)	< .001	-.01 (.08)	.93	.93 (.02)	<.001	.93 (.02)	< .001	.00	[-.01, .01]
Control condition	.03 (.01)	.01	.04 (.08)	.65	.95 (.02)	< .001	.95 (.02)	< .001	.00	[.00, .01]

Notes: Coefficients a through c' refer to path coefficients in Figure 2.

Table 14. Descriptive statistics and correlations among scales in Study 6.

	Mean	SD	Initial attitude	Sequential exposure	Final attitude
Accuracy condition					
Initial attitude	3.78	1.94	(.96)	.21**	.86**
Sequential exposure	.45	.50		-	.19**
Final attitude	4.00	1.98			(.97)
Control condition					
Initial attitude	3.93	1.98	(.96)	.17**	.83**
Sequential exposure	.46	.50		-	.12*
Final attitude	4.17	1.94			(.97)

Notes: Cronbach's alphas are on the correlation diagonals. Sequential exposure is 0 (1) if participants approached negative (positive) reviews first. Dash indicates that a variable was not measured. * $p < .05$. ** $p < .01$.

Table 15. Path coefficients and indirect effect for the mediation model in Study 6.

	a		**b**		**c**		**c'**		**Indirect effect**	
	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	β (S.E.)	p	Effect	95% CI
Accuracy condition	.05 (.01)	< .001	.01 (.12)	.89	.88 (.03)	< .001	.88 (.03)	< .001	.00	[-.01, .02]
Control condition	.04 (.01)	.003	-.08 (.13)	.53	.81 (.03)	< .001	.81 (.03)	< .001	.00	[-.02, .01]

Notes: Coefficients a through c' refer to path coefficients in Figure 2.

Table 16. Attitude-objects selected for the sequential exposure strategy scale.

Item	M	SD
Panel A: Fictitious consumer products		
Frontier Cigarettes	2.96	1.95
Bedon Adult Diapers	3.24	1.97
Zzzap Nose Hair Trimmers	3.53	1.99
Steri-Wipe Hand Wipes	4.95	1.20
Monahan LPI-800 Compact Microwave Oven	5.36	1.17
Sunny Valley Premium Roast Coffee	5.37	1.17
Panel B: Fictitious social-political topics		
The Feinberg-Marin Medical Marijuana Ban	2.08	1.48
The Legalize Sports Doping (LSD) Proposal	2.42	1.51
The Subsidized GMO Milk Bill	3.04	1.14
The Unrestricted Violent Video Games (UVVG) Bill	4.02	1.53
The Seattle Dignity in Death (DID) Euthanasia Law	4.65	1.28
The Wind Energy Mandate Bill	4.78	1.09

Notes: Mean and SDs are from the attitude-object pretests. Consumer products are displayed in panel 1, sorted from negative to positive. Social-political topics are displayed in panel 2, sorted from negative to positive. Consumer product ratings are based on 7-point scales, whereas social-political topic ratings are based on 6-point scales.

Table 17. Descriptive statistics and correlations for each attitude-object in Study 8.

	Mean	SD	Initial attitude	Sequential exposure	Final attitude
Frontier Cigarettes					
Initial attitude	2.23	1.61	(.97)	-.05	.88**
Sequential exposure	.31	.46		-	-.02
Final attitude	1.98	1.49			(.98)
Bedon Adult Diapers					
Initial attitude	3.98	1.11	(.83)	.17*	.53**
Sequential exposure	.33	.47		-	.09
Final attitude	3.46	1.36			(.94)
Zzzap Nose Hair Trimmers					
Initial attitude	4.20	1.12	(.92)	.11	.38**
Sequential exposure	.36	.48		-	.03
Final attitude	3.71	1.45			(.96)
Steri-Wipe Hand Wipes					
Initial attitude	4.93	1.29	(.96)	.05	.53**
Sequential exposure	.36	.48		-	-.16*
Final attitude	4.61	1.35			(.98)
Monahan LPI-800 Compact Microwave Oven					
Initial attitude	4.51	1.11	(.95)	.04	.40**
Sequential exposure	.37	.49		-	.09
Final attitude	3.72	1.57			(.97)
Sunny Valley Premium Roast Coffee					
Initial attitude	4.39	1.34	(.95)	.10	.73**
Sequential exposure	.39	.49		-	.03
Final attitude	4.29	1.51			(.96)
The Feinberg-Marin Medical Marijuana Ban					
Initial attitude	3.14	1.93	(.98)	.12	.75**
Sequential exposure	.40	.49		-	.12
Final attitude	3.08	2.12			(.98)
The Legalize Sports Doping (LSD) Proposal					
Initial attitude	2.54	1.63	(.98)	.08	.59**
Sequential exposure	.41	.49		-	.01
Final attitude	2.01	1.5			(.98)
The Subsidized GMO Milk Bill					
Initial attitude	3.68	1.46	(.98)	-.04	.47**
Sequential exposure	.44	.50		-	-.06
Final attitude	3.82	2.08			(.98)
The Unrestricted Violent Video Games Bill					
Initial attitude	3.51	1.73	(.91)	-.11	.42**
Sequential exposure	.47	.50		-	-.13
Final attitude	3.94	2.04			(.98)

Table 17 (cont.)

	Mean	SD	Initial attitude	Sequential exposure	Final attitude
The Seattle Dignity in Death Euthanasia Law					
Initial attitude	4.72	1.80	(.97)	-.06	.80**
Sequential exposure	.36	.48		-	-.11
Final attitude	4.55	2.05			(.98)
The Wind Energy Mandate Bill					
Initial attitude	5.23	1.48	(.97)	-.04	.66**
Sequential exposure	.42	.49		-	-.14
Final attitude	5.41	1.69			(.96)

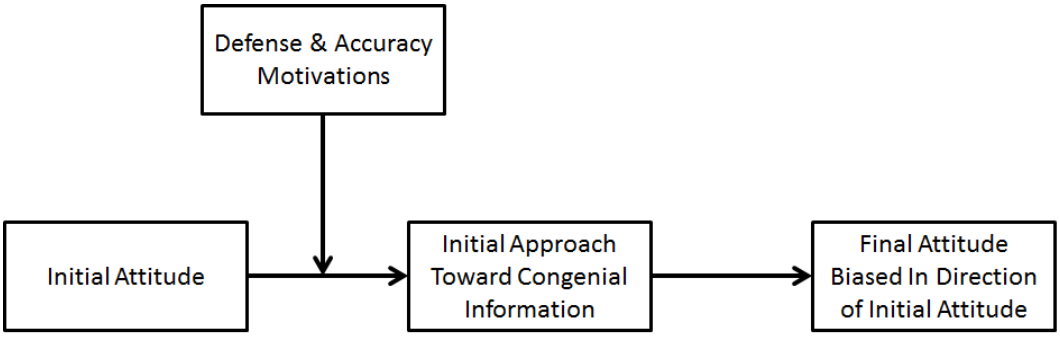
Notes: Correlations are among measures used for each stimulus, not between stimuli. Cronbach's alphas are on the correlation diagonals. Sequential exposure is 0 (1) if participants approached negative (positive) reviews first. Dash indicates that a variable was not measured. * $p < .05$. ** $p < .01$.

Table 18. Descriptive statistics and correlations among individual difference scales in Study 8.

Scale	Mean	SD	DAM	DC	Optimism	SE: Overall	SE: Consumer products	SE: Social topics	SE: Positive items	SE: Negative items
DAM	4.00	.68	(.67)	.20**	.14*	.00	-.02	.01	.00	.00
DC	5.31	.93		(.87)	.29**	-.18**	-.22**	-.14*	-.20**	-.16*
Optimism	4.65	1.35			(.88)	-.12	-.09	-.13	-.14*	-.08
SE: Overall	4.60	3.62				(.86)	.91**	.90**	.93**	.94**
SE: Consumer products	2.13	2.02					(.80)	.64**	.83**	.86**
SE: Social topics	2.51	1.97						(.75)	.85**	.83**
SE: Positive items	2.37	1.89							(.72)	.73**
SE: Negative items	2.24	2.00								(.78)

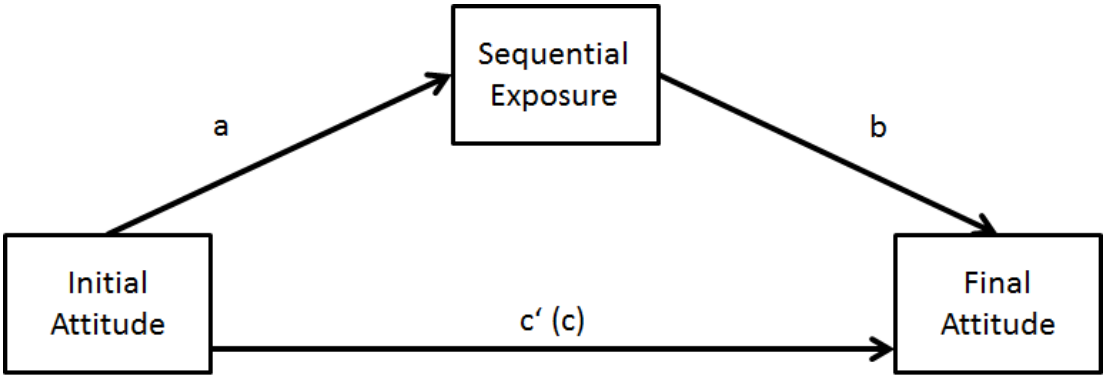
Notes: SE = Sequential exposure. Cronbach's alphas are on the correlation diagonals. * $p < .05$. ** $p < .01$.

Figure 1. The process model for the sequential exposure bias.



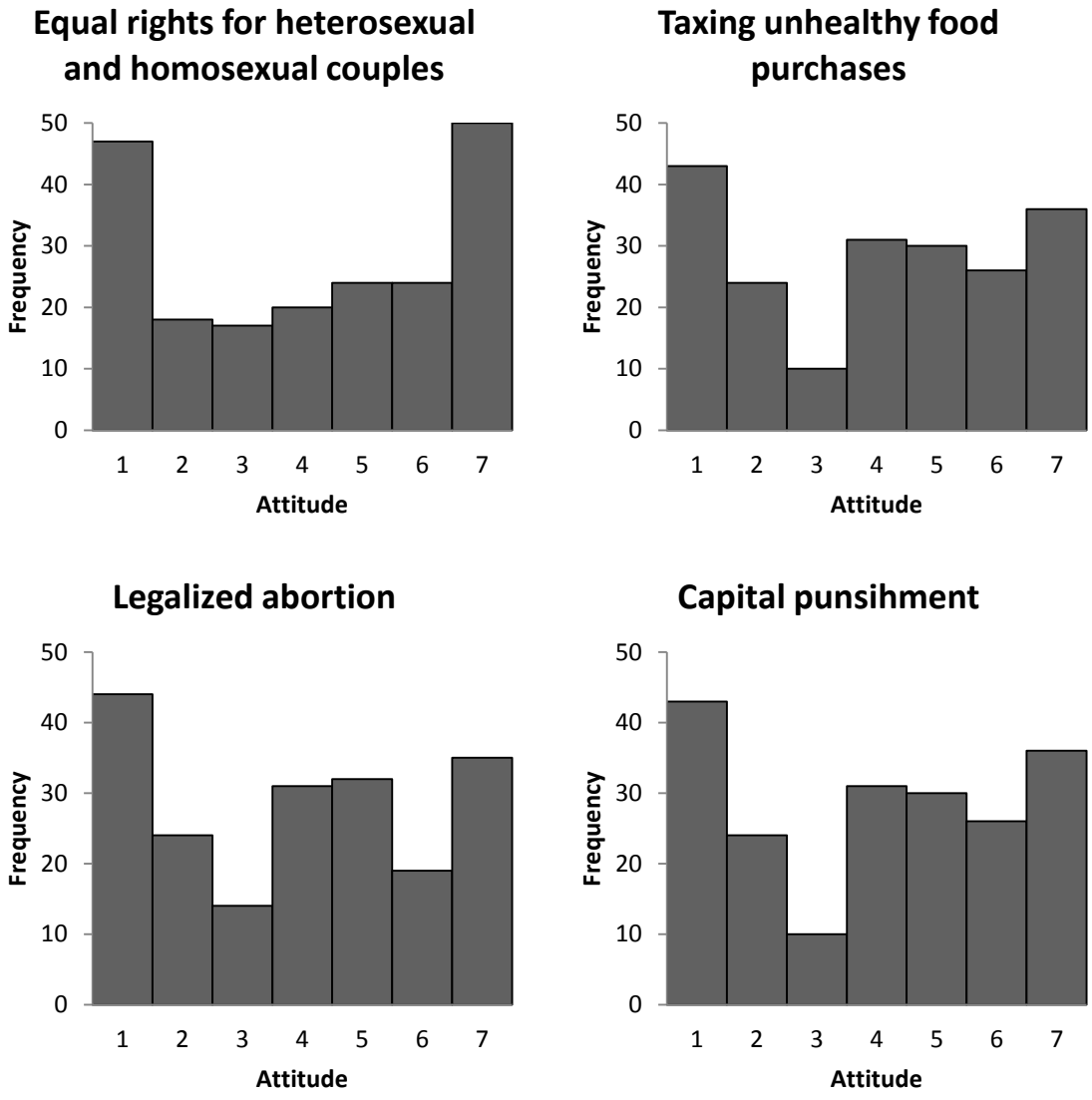
Notes: This is a conceptual model for sequential exposure bias effects related to a single attitude-object.

Figure 2. The mediation model used in Studies 1-6.



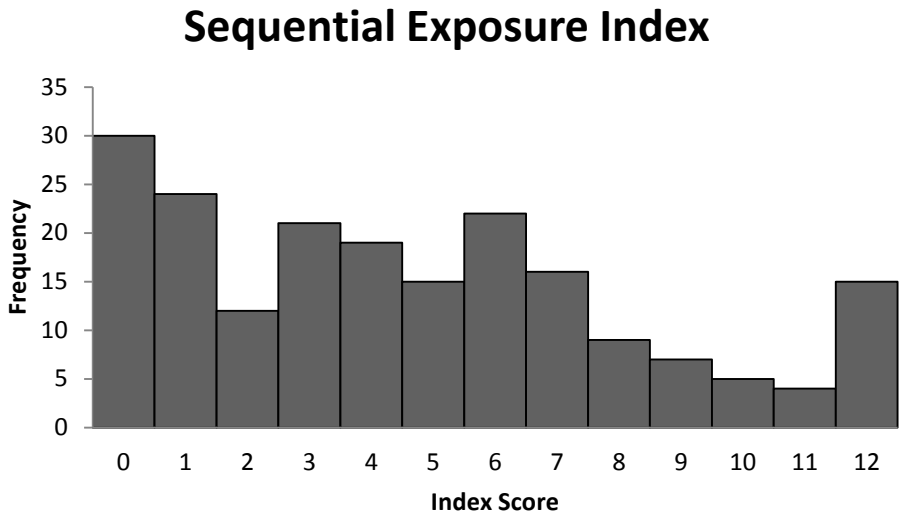
Notes: Sequential exposure is 0 (1) if participants approached negative (positive) reviews first.

Figure 3. Frequency distributions for bimodal items in the attitude-object pretest for Study 5.



Notes: Response scales ranges from 1 (*strongly dislike*) to 7 (*strongly like*).

Figure 4. Frequency distribution for the sequential exposure habit index in Study 8.



Notes: Low (high) sequential exposure habit scores indicate a stronger tendency to approach negative (positive) information first.

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APPENDIX A: STUDY 1 STIMULI

Reviews for the “Monahan LPI-800 Compact Microwave Oven”

Positive (5-star) product reviews

1. Great product! Compact design lets it fit anywhere. The metal exterior lets it blend into any kitchen.
2. I’m very happy with this microwave. It’s very easy and intuitive to operate and works great. There are even a few special feature buttons to cook popcorn and soft pretzels.
3. I couldn’t pass on this price. Very affordable! The rotating plate came with a small scratch but the company replaced it right away.

Negative (1-star) product reviews

1. The inside is too small. My normal size plates bump into the walls and stop rotation. I have to bend larger pieces of food (pizza) to fit them in.
2. Not a great buy. The small size also means small power so microwave times are longer than normal. Some of the special buttons are vague and confusing.
3. Cheap product that broke easily – the door jams and is tough to open. The company wouldn’t send me a replacement.

Reviews for “Sunny Valley Premium Roast Coffee”

Positive (5-star) product reviews

1. When I took my first sip I thought ‘wow this is amazing!’ Smooth and not much of an acid taste. About as close to perfect as I could describe!
2. Spectacular. Very rich and bold and not bitter. Packs a nice punch. Reminds me of coffee from an old-fashioned percolator.
3. This is the best coffee blend that we have ever tasted. My husband loves mild and I prefer a stronger blend but this coffee is perfect. It has such a great robust taste that it satisfies me and not too strong for him. I highly recommend this.

Negative (1-star) product reviews

1. This makes a very weak cup of a coffee with a disappointing taste. Will definitely not buy it again. I like a coffee with a rich flavor.... that is definitely not this!
2. Don't buy--the worst coffee I ever had. I returned it on my own dime and never heard a word in return. The problem was the taste of the coffee. It tasted burnt and quite stale and it was very bland and weak. It was undrinkable.
3. The last couple batches have been nothing short of horrible. No amount of cream or sugar makes this cup-o-Joe acceptable. It is by far the strongest horribly bitter coffee I've encountered.

Reviews for “Frontier Cigarettes”

Positive (5-star) product reviews

1. These smoke great and smooth and the taste is excellent. Will definitely buy again.
2. This product is very similar if not identical in taste to the cigarettes I smoke usually. It is a lighter menthol taste than usually (much lighter) but very nice. This is a top quality product.

3. When I first bought this I was not sure how they were going to be. They actually tasted better the more I had. I absolutely love them now and I bought 2 more packs!

Negative (1-star) product reviews

1. Has a horrible taste. Not appealing. Would never buy again. They need to revise their recipe. I nearly threw up after my first one.
2. I do not think I could get used to these. After my first puff I literally said out loud to no one in particular 'these taste like the zoo.'
3. I have to say these things were gross. They don't really taste like menthol and I felt like I was smoking incense. Save your money.

APPENDIX B: THE DISPOSITIONAL ATTITUDE MEASURE

[Hepler, J., & Albarracin, D. (2013). Attitudes without objects: Evidence for a dispositional attitude, its measurement, and its consequences. *Journal of Personality and Social Psychology, 104*, 1060-1076.]

Instructions: We are interested in your attitudes toward a wide variety of objects and issues. Please rate each object/issue using the scale provided. There are no right or wrong answers, and no trick questions. We are simply interested in how YOU feel about each of these objects/issues.

1 Extremely unfavorable	2	3	4	5	6	7 Extremely favorable

1. ____ Architecture
2. ____ Bicycles
3. ____ Camping
4. ____ Canoes
5. ____ Cold showers
6. ____ Doing crossword puzzles
7. ____ Japan
8. ____ Playing chess
9. ____ Politics
10. ____ Public speaking
11. ____ Receiving criticism
12. ____ Rugby
13. ____ Soccer
14. ____ Statistics
15. ____ Taxes
16. ____ Taxidermy

APPENDIX C: ATTITUDE-OBJECTS PRETESTED FOR STUDIES 5-6

Table C.1. Descriptive statistics for pretested attitude-objects in Studies 5-6.

Item	Mean	SD
Adopting children from foreign countries	4.41	1.85
Birth control pills	4.56	2.04
Capital punishment	4.21	2.13
Capitalism	4.28	1.63
Communism	3.54	1.79
Consuming alcohol	2.94	1.91
Consuming genetically modified food	2.88	1.74
Equal rights for heterosexual and homosexual couples	4.14	2.33
Gambling	3.11	1.91
Gay marriage	3.18	2.21
Government censorship	3.76	1.90
Government provided health care	5.61	1.70
Gun ownership	3.37	1.96
Handguns	3.15	1.96
Immigration	4.42	1.65
Israel	4.02	1.62
Legal euthanasia (Legal assisted suicide)	3.34	1.99
Legalized abortion	3.90	2.16
Legalized marijuana	3.44	2.01
Maternity leave	5.75	1.64
Paternity leave	5.26	1.75
Pornography	3.63	1.87
Prostitution	2.73	1.86
Reducing pollution to stop global warming	5.89	1.63
Running marathons	5.27	1.70
Smoking cigarettes	2.08	1.63
Socialism	4.75	1.79
Stay at home mothers	5.54	1.51
Taxing unhealthy food purchases	4.02	2.19
Tenure for college professors	4.31	1.55
The theory of evolution	5.10	1.61
The use of torture	2.75	1.80
Unemployment benefits	4.51	1.91
Using antidepressant medications	3.75	1.87
Vegan diet	4.35	1.67
Vegetarian diet	5.14	1.71
Violent movies	3.54	1.94
Violent video games	3.33	1.99
War	2.11	1.62

Table C.1 (cont.)

Item	Mean	SD
Welfare	5.09	1.86
Wind power as a source of electricity	6.12	1.33
Women serving as combat soldiers in the military	5.05	1.80
Working mothers	5.47	1.58

Notes: Response scales ranges from 1 (*strongly dislike*) to 7 (*strongly like*).

APPENDIX D: ATTITUDE COMMITMENT SCALE

Instructions: Consider your attitude toward [this topic]…

1. How strongly do you hold your views on this topic?

1	2	3	4	5	6	7
Not at all						Extremely

2. How important are your views on this topic to you?

1	2	3	4	5	6	7
Not at all						Extremely

3. How concerned are you about this topic?

1	2	3	4	5	6	7
Not at all						Extremely

4. How often do you think about this topic?

1	2	3	4	5	6	7
Never						Regularly

5. How often have you expressed your views on this topic to friends or family?

1	2	3	4	5	6	7
Never						Regularly

6. Would you ever volunteer time for a group that supports your views on this topic?

1	2	3	4	5	6	7
Definitely no					Definitely yes	

APPENDIX E: STUDY 5-6 STIMULI

Reviews for “Equal rights for heterosexual and homosexual couples”

Opinions in favor (“pros”)

1. Legalizing gay marriage will not harm heterosexual marriages or family values. A study published on April 13, 2009 in the scientific journal Social Science Quarterly found that "laws permitting same-sex marriage or civil unions have no adverse effect on marriage, divorce, and abortion rates, [or] the percent of children born out of wedlock..." in states and countries in which those laws exist.
2. There is no such thing as traditional marriage. Given the prevalence of modern and ancient examples of family arrangements based on polygamy, communal child-rearing, the use of concubines and mistresses, and the commonality of prostitution, heterosexual monogamy can be considered "unnatural” in evolutionary terms.
3. Gay marriages can bring financial gain to state and local governments. Revenue from gay marriage comes from marriage licenses, higher income taxes (the so-called "marriage penalty"), and decreases in costs for state benefit programs. The Comptroller for New York City (New York, USA) found that legalizing gay marriage would bring $142 million to the City’s economy and $184 million to the State’s economy over three years. Similar financial gains can be expected in other states and countries.

Opinions in opposition (“cons”)

1. Gay marriage will lead to more children being raised in same-sex households which are not an optimal environment because children need both a mother and father. An April 2001 study published in the scientific journal American Sociological Review found that girls who are raised apart from their fathers are reportedly at higher risk for early sexual activity and teenage pregnancy. Also, children without a mother are deprived of the emotional security and unique advice that mothers provide.
2. Marriage is not a right. Society can choose to endorse certain types of sexual arrangements and give support in the form of benefits to these arrangements. Marriage was created to allow society to support heterosexual couples in procreation and society can choose to give or not to give the same benefits to same-sex couples.
3. Gay marriage will accelerate the assimilation of gay and lesbian individuals into mainstream heterosexual culture. The gay community has created its own vibrant culture. By reducing the gap of experiences between groups, this unique culture may cease to exist. Marriage means adopting heterosexual forms of family and perhaps even abandoning gay and lesbian culture.

Reviews for “Legalized abortion”

Opinions in favor (“pros”)

1. Access to legal, professionally-performed abortions reduces injury and death caused by unsafe, illegal abortions. The World Health Organization estimated in 2006 that "back-alley" abortions cause 68,000 maternal deaths each year in countries where abortion is not legal.
2. Many women who choose abortion don't have the financial resources to support a child. Among women who had an abortion, 73% of respondents said they could not afford to have a baby. Reproductive choice protects women as a group from financial

disadvantage.

3. Abortion gives couples the option to choose not to bring babies with severe and life-threatening medical conditions to full term. Fragile X syndrome, the most common genetic form of mental retardation, affects about 1 in 4,000 males and 1 in 8,000 females. One in 800 babies have Down Syndrome, and one in 3,500 babies are born with Cystic Fibrosis. It is wrong to sentence a child to life with an acute handicap.

Opinions in opposition (“cons”)

1. The original text of the Hippocratic Oath, traditionally taken by doctors when swearing to practice medicine ethically, forbids abortions. One section of the original, ancient oath reads: "I will not… cause an abortion." The modern version of the Hippocratic Oath, written in 1964 by Luis Lasagna, still forbids abortion in the line, "Above all, I must not play at God."

2. Abortion providers are in business to make money rather than to assist their clients. The abortion industry generates an estimated $831 million USD annually. An abortion can cost anywhere from around $350 USD to more than $1,000 USD.

3. Abortions cause psychological damage. A 2002 scientific study of 173,000 American women found that women who aborted were 154% more likely to commit suicide than women who carried to term. A 1998 study of men whose partners had abortions found that 52% of the men reported regret, 45% felt sadness, and 26% experienced depression.

APPENDIX F: ATTITUDE-OBJECTS USED FOR STUDY 7

Table F.1. Attitude-objects used for Study 7

Attitude-objects	**Time 1**
Allowing children to play violent video games	x
Amnesty for illegal immigrants	
Consuming milk	x
Drug use in sports	
Euthanasia (doctor assisted suicide)	x
Gay marriage	
Legalized abortion	x
Lowering corporate tax rates to create jobs	
Lowering the legal drinking age to 18	x
Medical marijuana	
Obamacare (The affordable care act)	x
Policies to reduce the impact of humans on climate change	
Standardized testing	x
Tenure for high school teachers	
The D.A.R.E. program	x
The death penalty	
Vaccinating children	x
Vegetarianism	
Voting machine use	x
Voting rights for felons	

Notes: An ‘x’ in the Time 1 column indicates that the attitude-object was presented at Time 1. All attitude-objects were presented at Time 2. Attitude-objects were presented in alphabetical order at both time points.

APPENDIX G: STUDY 7 STIMULI

Allowing children to play violent video games

Pro: Violent video games do not contribute to youth violence. Violent juvenile crime in the United States has been declining as violent video game popularity has increased. The arrest rate for juvenile murders has fallen 71.9% from 1995-2008. The arrest rate for all juvenile violent crimes has declined 49.3%. In this same period, video game sales have quadrupled. The small correlations found between video games and violence may be explained by violent youth being drawn to violent games. Violent games do not cause youth to be violent. Instead, youth that are predisposed to be violent seek out violent entertainment.

Con: Violent video games contribute to youth violence. Video games often reward players for simulating violence, and thus enhance the learning of violent behaviors. Studies suggest that when violence is rewarded in video games, players exhibit increased aggressive behavior compared to players of video games where violence is punished. Violent video games teach youth that violence is an acceptable conflict-solving strategy and an appropriate way to achieve one's goals. A 2009 study found that youth who play violent video games have lower belief in the use of nonviolent strategies and are less forgiving than players of nonviolent video games.

Amnesty for illegal immigrants

Pro: Illegal immigrants should be allowed to become US citizens. I supported and was prepared to vote for amnesty for decades. And it is essential to have immigration reform. Anyone who has been in this country for five or six years, who has paid their taxes, who has stayed out of trouble, ought to be able to translate into an American citizenship immediately, not waiting.

Con: Illegal immigrants should not be allowed to become US citizens. Amnesty is a reward to those breaking the law. Amnesty forgives illegal entry to the US, and it forgives related illegal activities such as driving illegally and working using false documents. Amnesty results in foreigners who illegally entered the US being given legal status as a reward for breaking the law. Amnesty encourages additional illegal immigration.

Consuming milk

Pro: Drinking milk is healthy for humans. The role of milk in nature is to nourish and provide immunological protection for the mammalian young. Milk has been a food source for humans since prehistoric times – from human, goat, buffalo, sheep, yak, and cows. Milk and honey are the only articles of diet whose sole function in nature is food. It is not surprising, therefore, that the nutritional value of milk is high.

Con: Drinking milk is unhealthy for humans. Drinking milk has been linked to iron-deficiency, cramps and diarrhea, and multiple forms of allergy. In no mammalian species, except for the human (and the domestic cat), is milk consumption continued after infancy. In many other parts of the world, most particularly in East Asia, Africa, and South America, people regard cow milk as unfit for consumption by adult human beings

Drug use in sports

Pro: Drug use in sports should be legal. Because doping is illegal, the pressure is to make performance enhancers undetectable, rather than safe. Performance enhancers are produced or bought on the black market and administered in a secret, uncontrolled way with no monitoring of the athlete's health. Allowing the use of performance enhancers would make sport safer as there would be less pressure on athletes to take unsafe enhancers and a pressure to develop new safe performance enhancers. The removal of doping controls would have major benefits: less cheating, increased solidarity and respect between athletes, more focus on sport and not on rules.

Con: Drug use in sport should be illegal. Steroids are dangerous. They can hurt a player's heart, liver, and other parts of his body. Players may be risking their lives for a chance to be bigger and stronger. Millions of kids still dream about playing in the major leagues. They have posters of Nomar Garciaparra, Barry Bonds, and Randy Johnson on their bedroom walls. MLB is setting the worst possible example for these kids by doing nothing about steroid use. Baseball is telling kids that they may have to take dangerous and illegal drugs if they want to reach their dreams of playing in the big leagues.

Euthanasia (doctor assisted suicide)

Pro: Euthanasia should be legal. At the Hemlock Society, we get calls daily from desperate people who are looking for someone like Jack Kevorkian to end their lives which have lost all quality. Americans should enjoy a right guaranteed in the European Declaration of Human Rights – the right not to be forced to suffer. It should be considered as much of a crime to make someone live who with justification does not wish to continue as it is to take life without consent.

Con: Euthanasia should be illegal. If legalized, the elderly may face pressure to 'die and get out of the way.' Also at risk are the poor and minorities, who have been shown to suffer more physical pain than other groups. The handicapped are also at risk of being pressured to choose euthanasia rather than continued treatment, either through direct pressure or inadequate treatment of their pain and suffering. The only way to achieve adequate protection for these groups is to maintain a bright-line against physician-assisted suicide.

Gay marriage

Pro: Legalizing gay marriage will not harm heterosexual marriages or family values. A study published on April 13, 2009 in the scientific journal Social Science Quarterly found that “laws permitting same-sex marriage or civil unions have no adverse effect on marriage, divorce, and abortion rates, [or] the percent of children born out of wedlock...” in states and countries in which those laws exist.

Con: Gay marriage should be illegal. Marriage is not a right. Society can choose to endorse certain types of sexual arrangements and give support in the form of benefits to these arrangements. Marriage was created to allow society to support heterosexual couples in procreation and society can choose to give or not to give the same benefits to same-sex couples.

Legalized abortion

Pro: Abortion should be legal. Abortion gives couples the option to not bring babies with severe and life-threatening medical conditions to full term. Fragile X syndrome affects 1 in 4,000 males and 1 in 8,000 females. One in 800 babies have Down Syndrome, and one in 3,500 babies are born with Cystic Fibrosis. It is wrong to sentence a child to life with an acute handicap.

Con: Abortion should be illegal. The original text of the Hippocratic Oath, traditionally taken by doctors when swearing to practice medicine ethically, forbids abortions. One section of the original, ancient oath reads: "I will not… cause an abortion." The modern version of the Hippocratic Oath, written in 1964 by Luis Lasagna, still forbids abortion in the line, "Above all, I must not play at God."

Lowering corporate tax rates to create jobs

Pro: Lowering corporate tax rates will create jobs. The average five-year unemployment rate decreased from 1987 to 1991 after the United States lowered its top corporate income tax rate. During Ronald Reagan's presidency (1981 – 1988), the Tax Reform Act of 1986 (implemented in July 1987) lowered the top federal corporate income tax rate from 46% to 34%. From 1982 to 1986, the average unemployment rate was 8.2%. From 1987 to 1991, the average unemployment rate was 5.9%.

Con: Lowering corporate tax rates will not create jobs. Companies hire employees because they need workers, not because of corporate income tax rates. According to billionaire Mark Cuban, "you hire people because you need them. You don't hire them because your taxes are lower." In a 2011 survey of economists, 65% said that lack of demand was the main reason employers were not hiring new employees, whereas only 27% said uncertainty about corporate taxation was the main reason.

Lowering the legal drinking age to 18

Pro: The legal drinking age should be lowered to 18. Allowing 18-20 year-olds to drink alcohol in regulated environments with supervision would decrease unsafe drinking activity. Prohibiting this age group from drinking in bars, restaurants, and other licensed locations causes them to drink in unsupervised places such as fraternity houses or house parties where they may be more prone to binge drinking and other unsafe behaviors.

Con: The legal drinking age should be kept at 21. Many rights in the US are conferred on citizens at age 21 or older. Citizens cannot purchase handguns, gamble in casinos, or adopt a child until age 21, rent a car until age 25, or run for President until age 35. Drinking should be similarly restricted due to the responsibility required to self and others.

Medical marijuana

Pro: Medical marijuana should be legal. I believe that a federal policy that prohibits physicians from alleviating suffering by prescribing marijuana for seriously ill patients is misguided, heavy-handed, and inhumane. Federal authorities should rescind their prohibition of the medicinal use of marijuana for seriously ill patients and allow physicians to decide which patients to treat. The government should change marijuana's status from that of a Schedule 1 drug (considered to be

potentially addictive and with no current medical use) to that of a Schedule 2 drug (potentially addictive but with some accepted medical use) and regulate it accordingly.

Con: Medical marijuana should be illegal. Many who claim to need marijuana medicinally simply want to use it recreationally. In states with marijuana dispensaries, the majority of 'patients' are young men (ages 18-25), not the cancer or AIDS victims used in voter ads to exploit our compassionate nature. 'Medicalizing' marijuana has caused truly ill people to refuse proper medical care, thinking that because marijuana makes them feel better they are getting better. The medical excuse marijuana movement has become a device used by special interest groups to exploit the sick and dying and well-meaning voters for their own purposes.

Obamacare (The affordable care act)

Pro: The affordable care act is good for America. Under this act, tens of thousands of uninsured Americans with preexisting conditions, the parents of children who have a preexisting condition, will finally be able to purchase the coverage they need. Further, insurance companies will no longer be able to drop people's coverage when they get sick. They won't be able to place lifetime limits or restrictive annual limits on the amount of care they can receive. All new insurance plans will be required to offer free preventive care. Finally, young adults will be able to stay on their parents' policies until they're 26 years old. Once this reform is implemented, health insurance exchanges will be created, a competitive marketplace where uninsured people and small businesses will finally be able to purchase affordable, quality insurance.

Con: The affordable care act is bad for America. Instead of eliminating the root of the country's medical problem – the profit-driven, private health insurance industry – this costly new legislation will enrich these firms. The bill requires millions of Americans to buy private insurers' defective products, and turn over to them vast amounts of public money. The Obama administration has saddled Americans with an expensive package of onerous individual mandates, new taxes on workers' health plans, countless sweetheart deals with the insurers and Big Pharma, and a perpetuation of the fragmented, dysfunctional, and unsustainable system that is taking such a heavy toll on our health and economy today. This bill's passage reflects political considerations, not sound health policy. As physicians, we cannot accept this inversion of priorities. We seek evidence-based remedies that will truly help our patients, not placebos.

Policies to reduce the impact of humans on climate change

Pro: Policies should be created to reduce climate change. 75% of the 20th century increase in the atmospheric greenhouse gas CO2 is directly caused by human actions like burning fossil fuels. CO2 levels were 389 ppm (parts per million) as of April 2010 – the highest they have been in the past 650,000 years. This increase in CO2 was a substantial contributor to the 1-1.4 degree F warming over the 20th century. These changes have caused increases in the frequency and intensity of tropical cyclone, melted polar ice caps, raised ocean levels, and changed the climate across large geographic regions.

Con: Policies should not be created to reduce climate change. The 20th century warming of 1-1.4 degree F is within the +/- 5 degree F range of the past 3,000 years. A 2003 study showed temperatures from 1000-1100 AD that are comparable to those from 1900-1990. Rising CO2 levels are a result of global warming, not a cause of it. As temperatures increase, CO2 is released

from “carbon sinks” such as the oceans or the Arctic tundra. Measurements of ice core samples show that over the last four climactic cycles (past 240,000 years) periods of global warming preceded global increases in CO2.

Standardized testing

Pro: The use of standardized tests improves education. Standardized tests provide a lot of useful information at low cost, and consume little class time. Standardized tests cost less than 0.1% of K-12 education spending, totaling $5.81 per student per year. A 50-item standardized test can be given in an hour and is graded instantaneously by computer. The multiple-choice format used on standardized tests produces accurate information necessary to assess and improve American schools. The Center for Public Education, a national public school advocacy group, says many “multiple-choice tests now require considerable thought, even notes and calculations, before choosing a bubble.”

Con: The use of standardized tests does not improve education. Standardized testing has not improved student achievement. After No Child Left Behind passed in 2002, the US slipped from 18th in the world in math on the Programme for International Student Assessment to 31st place in 2009, with a similar drop in science and no change in reading. A May 2011 National Research Council report found no evidence test-based incentive programs are working: “Despite using them for several decades, policymakers and educators do not yet know how to use test-based incentives to consistently generate positive effects on achievement and to improve education.”

Tenure for high school teachers

Pro: High school teachers should receive tenure. Tenure prohibits school districts from firing experienced teachers to hire less experienced and less expensive teachers. The threat of firing has increased in recent years as many school districts face budget cuts. According to Marcia Rothman, a New York City teacher of 14 years, “They don’t want old experienced teachers who are too expensive. It’s a concerted effort to harass older teachers, so they can hire cheaper, younger teachers.”

Con: High school teachers should not receive tenure. Tenure makes it difficult to remove underperforming teachers because the process involves months of legal wrangling by the principal, the school board, the union, and the courts. A 2009 study found that 81% of school administrators knew a poorly performing tenured teacher at their school; however, 86% of administrators said they do not always pursue dismissal of teachers because of the costly and time consuming process.

The D.A.R.E. program

Pro: The D.A.R.E. program should be used in schools. Critics who say the D.A.R.E. program is worthless neglect the fact that one of the program's more valuable results is the positive relationship it fosters among police, families, and schools. D.A.R.E. allows greater social interaction between police officers and children. Results from a 2007 study indicates that students prefer police officers as instructors, suggesting that programs delivered by police officers, such as D.A.R.E., are more likely to have a positive impact.

Con: The D.A.R.E. program should not be used in schools. The popularity of the program camouflages the fact that it does not work. Evidence from over 30 studies concluded D.A.R.E. "does not prevent drug use" in students and D.A.R.E. graduates "are indistinguishable from students who do not participate in the program. A peer-reviewed, six-year study published in 1998 concluded that suburban students who participated in D.A.R.E. reported a 3%-5% higher rate of drug use than suburban students who did not participate.

The death penalty

Pro: The death penalty should be legal. I have no illusions that the death penalty deters anyone from murder. I also have great concern about the ability of our justice system to avoid putting someone innocent to death. However, I believe there are some human beings who do such evil as to deserve to die. I am not troubled that Timothy McVeigh was executed for the 168 people he had killed in the Oklahoma City bombing, or that John Wayne Gacy was executed for committing 33 murders.

Con: The death penalty should not be legal. It is immoral in principle, and unfair and discriminatory in practice. When the government metes out vengeance disguised as justice, it becomes complicit with killers in devaluing human life. In society, we reject the principle of literally doing to criminals what they do to their victims: The penalty for rape cannot be rape, or for arson, the burning down of the arsonist's house. We should not, therefore, punish the murderer with death. Capital punishment is a barbaric remnant of uncivilized society.

Vaccinating children

Pro: Vaccines should be legally required for children. No individual should have the right to risk the health of the public solely to satisfy their personal views. Vaccines can eradicate disease and prevent serious illness and death. Mandatory vaccination has eradicated diseases that once killed thousands of children, such as polio and smallpox. According to researchers at the Pediatric Academic Society, childhood vaccinations in the US prevent about 10.5 million cases of infectious illness and 33,000 deaths per year.

Con: Vaccines should not be legally required for children. Governments should not have the right to intervene in health decisions. 31% of parents believe they should have the right to refuse mandated school entry vaccinations for their children, according to a 2010 survey by the University of Michigan. Further, some parents hold religious beliefs against vaccination. Forcing such parents to vaccinate their children would violate the 1st Amendment which guarantees citizens the right to the free exercise of their religion.

Vegetarianism

Pro: People should eat vegetarian diets. It is cruel and unethical to kill animals for food when vegetarian options are available. Animals are sentient beings that have emotions and social connections. Scientific studies show that cattle, pigs, chickens, and all warm-blooded animals can experience stress, pain, and fear. In the United States about 35 million cows, 115 million pigs, and 9 billion birds are killed for food each year. These animals should not have to die to satisfy an unnecessary dietary preference.

Con: People should not eat vegetarian diets. Eating meat is not cruel or unethical; it is a natural part of the cycle of life. Vegetarians mistakenly elevate the value of animal life over plant life. Research shows that plants respond electrochemically to threats, so vegetarians also cause harm when they kill and eat plants. Every organism on earth dies or is killed at some point so others organisms can live. There is nothing wrong with this cycle; it is how nature works.

Voting machine use

Pro: Voting machines improve the voting process. These machines are much faster and more accurate at recording the voter's intent than having to mark a paper ballot with a pencil. Further, they provide less opportunity for error. Clinging to the past with the purported security of paper ballots and antiquated voting methods will continue to produce long lines. Secure, accurate, and reliable voting equipment has greatly enhanced the voting experience. These innovative software tools provide easy-to-use data management that is compatible with most existing systems.

Con: Voting machines do not improve the voting process. E-voting is vulnerable to all the corruption techniques associated with traditional elections, plus additional e-cheating methods that can be implemented on a large scale. Even under ideal conditions, it would be extremely difficult to detect many conceivable e-cheating methods. A better approach is to have teams of poll workers and poll watchers manually count ballots manually marked by voters. This simple, time-tested method, used in most industrialized countries outside the US, seems to work very well.

Voting rights for felons

Pro: Felons should be allowed to vote. The largest group of US citizens denied the right to vote is felons. The disenfranchisement of felons, and former felons, from participation in democratic elections threatens the health of American democracy in a number of ways. While states have legitimate reasons to compel felons to make restitution to their victims, and to punish recidivists or violent offenders more harshly than others, there are no logical reasons for imposing disenfranchisement in such cases.

Con: Felons should not be allowed to vote. Individuals who have shown they are unwilling to follow the law cannot claim the right to make laws for the rest of us. We don't let everyone vote, not children, for instance, or noncitizens, or the mentally incompetent. We have certain minimum standards of trustworthiness before we let people participate in the serious business of self-government, and people who commit serious crimes don't meet those standards.

APPENDIX H: ATTITUDE-OBJECTS PRETESTED FOR STUDY 8

Table H.1. Descriptive statistics for pretested attitude-objects in Study 8.

Item	Mean	SD	*t*	*p*	Negative	Positive
The 2009 Public Affairs Act	3.64	0.78	1.28	.21		
The 2012 Dairy Consumption Act	3.55	1.12	0.32	.75		
The 2013 US-Mexico Amnesty Proposal	3.92	1.37	2.14	.04		x
The Chicago Firearms Ban Bill	4.08	1.69	2.43	.02		x
The Concealed Carry Permit Act	3.74	1.50	1.13	.26		
The Dilworth Mandatory Vaccination Act	3.92	1.40	2.10	.04		x
The Feinberg-Marin Medical Marijuana Ban	2.08	1.48	-6.77	< .01	x	
The Fossil Fuel Penalty Proposal	3.73	1.43	1.15	.25		
The Legalize Sports Doping (LSD) Proposal	2.42	1.51	-5.05	< .01	x	
The Monetary Control Bill	3.51	0.84	0.08	.93		
The New York Corporate Tax Holiday Act of 2013	3.26	1.41	-1.20	.24		
The Seattle Dignity in Death (DID) Euthanasia Law	4.65	1.28	6.29	< .01		x
The Secular Pledge of Allegiance (SPA) Proposal	3.69	1.50	0.90	.37		
The Subsidized GMO Milk Bill	3.04	1.14	-2.85	.01	x	
The Traditional Marriage Benefit Bill	2.42	1.54	-4.96	< .01	x	
The Truth in Lending Act	4.69	1.23	6.80	< .01		x
The Unrestricted Violent Video Games (UVVG) Bill	4.02	1.53	2.40	.02		x
The US Standardized TEST Proposal	3.84	1.35	1.79	.08		
The Voting Rights for Felons Bill	3.55	1.54	0.23	.82		
The Wind Energy Mandate Bill	4.78	1.09	8.28	< .01		x

Notes: Response scales ranges from 1 (*strongly dislike*) to 6 (*strongly like*). An 'x' in the Negative or Positive column indicates that the item was significantly below or above the sale midpoint, respectively.

APPENDIX I: STUDY 8 STIMULI

Reviews for negative consumer products

Frontier Cigarettes

Positive: When I first bought this I was not sure how they were going to be. They actually tasted better the more I had. I absolutely love them now and I bought 2 more packs!

Negative: I do not think I could get used to these. After my first puff I literally said out loud to no one in particular “these taste like the zoo.”

Bedon Adult Diapers

Positive: Man these things are the best. They can handle whatever issues I throw at them. I've done considerable load testing as I'm a truck driver who makes infrequent stops. Thanks for making my life easier!

Negative: The refastenable portion of this protective pant does not provide a snug fit. In addition, the absorbent material in the underpants breaks up in sections when wet with urine. These are horrible quality diapers.

Zzzap Nose Hair Trimmers

Positive: The trimmer works exceptionally well and gives a close trim. Yes, it’s very expensive, but it’s a great unit and worth the extra money. I highly recommend.

Negative: This product worked absolutely great for a while. Unfortunately it only lasted 4 months. I called the number on the warranty sheet, and they told me they don’t fix nose trimmers. This is the last Zzzap product I will ever buy.

Reviews for positive consumer products

Steri-Wipe Hand Wipes

Positive: Nice convenient sized packets, cleans my hands, big enough to get the job done with one sheet, and it doesn't leave my hands feeling sticky or dried out like some other hand sanitizers. They are a great affordable option for handy hand sanitizing wipes!

Negative: I bought these very recently and the entire box (yes, the ENTIRE box) is already dried-out and useless. What the heck is the point of hand wipes that don't even stay moist enough to use? Don't buy these.

Monahan LPI-800 Compact Microwave Oven

Positive: I'm very happy with this microwave. It's very easy and intuitive to operate and works great. There are even a few special feature buttons to cook popcorn and soft pretzels.

Negative: The inside is too small. My normal size plates bump into the walls and stop rotation. I have to bend larger pieces of food (pizza) to fit them in.

Sunny Valley Premium Roast Coffee

Positive: This is the best coffee blend that we have ever tasted. My husband loves mild and I prefer a stronger blend but this coffee is perfect. It has such a great robust taste that it satisfies me and not too strong for him. I highly recommend this.

Negative: The last couple batches have been nothing short of horrible. No amount of cream or sugar makes this cup-o-Joe acceptable. It is by far the strongest horribly bitter coffee I've encountered.

Reviews for negative social-political topics

The Feinberg-Marin Medical Marijuana Ban

Positive: Medical marijuana should be illegal. Many who claim to need marijuana medicinally simply want to use it recreationally. In states with marijuana dispensaries, the majority of "patients" are young men (ages 18-25), not the cancer or AIDS victims used in voter ads to exploit our compassionate nature. "Medicalizing" marijuana has caused truly ill people to refuse proper medical care, thinking that because marijuana makes them feel better they are getting better. The medical excuse marijuana movement has become a device used by special interest groups to exploit the sick and dying and well-meaning voters for their own purposes. This proposed ban will keep illicit substances out of the hands of criminals and encourage proper medical treatment among the ill.

Negative: Medical marijuana should be legal. I believe that a federal policy that prohibits physicians from alleviating suffering by prescribing marijuana for seriously ill patients is misguided, heavy-handed, and inhumane. Federal authorities should rescind their prohibition of the medicinal use of marijuana for seriously ill patients and allow physicians to decide which patients to treat. The government should change marijuana's status from that of a Schedule 1 drug (considered to be potentially addictive and with no current medical use) to that of a Schedule 2 drug (potentially addictive but with some accepted medical use) and regulate it accordingly. The proposed ban will keep legitimate medicine out of the hands of those who need it most.

The Legalize Sports Doping (LSD) Proposal

Positive: Drug use in sports should be legal. Because doping is illegal, the pressure is to make performance enhancers undetectable, rather than safe. Performance enhancers are produced or bought on the black market and administered in a secret, uncontrolled way with no monitoring of the athlete's health. Allowing the use of performance

enhancers would make sport safer as there would be less pressure on athletes to take unsafe enhancers and a pressure to develop new safe performance enhancers. The removal of doping controls would have major benefits: less cheating, increased solidarity and respect between athletes, more focus on sport and not on rules. This proposal holds great promise for the future of sport.

Negative: Drug use in sport should be illegal. Steroids are dangerous. They can hurt a player's heart, liver, and other parts of his body. Players may be risking their lives for a chance to be bigger and stronger. Millions of kids still dream about playing in the major leagues. They have posters of Nomar Garciaparra, Barry Bonds, and Randy Johnson on their bedroom walls. Pro sports are setting the worst possible example for these kids by doing nothing about steroid use. This proposal is essentially telling kids that they may have to take dangerous and illegal drugs if they want to reach their dreams of playing in the big leagues. This proposal must be stopped.

The Subsidized GMO Milk Bill

Positive: Drinking milk is healthy for humans, and genetically enriched milk simply enhances those benefits. The role of milk in nature is to nourish and provide immunological protection for the mammalian young. Milk has been a food source for humans since prehistoric times – from human, goat, buffalo, sheep, yak, and cows. Milk and honey are the only articles of diet whose sole function in nature is food. It is not surprising, therefore, that the nutritional value of milk is high, and modern GMO technologies have made milk better than ever. Subsidizing genetically enriched milk will provide health benefits to millions of Americans.

Negative: Drinking milk is unhealthy for humans whether it is genetically modified or not. Drinking milk has been linked to iron-deficiency, cramps and diarrhea, and multiple forms of allergy. In no mammalian species, except for the human (and the domestic cat), is milk consumption continued after infancy. In many other parts of the world, most particularly in East Asia, Africa, and South America, people regard cow milk as unfit for consumption by adult human beings. GMO milk doesn’t resolve these issues. Subsidizing this product threatens to make things worse by increasing the appeal of milk when it should be phased out of our diets.

Reviews for positive social-political topics

The Unrestricted Violent Video Games (UVVG) Bill

Positive: This bill is long overdue – the sale of violent video games to minors should not be restricted. Violent video games do not contribute to youth violence. Violent juvenile crime in the United States has been declining as violent video game popularity has increased. The arrest rate for juvenile murders has fallen 71.9% from 1995-2008. The arrest rate for all juvenile violent crimes has declined 49.3%. In this same period, video game sales have quadrupled. The small correlations found between video games and violence may be explained by violent youth being drawn to violent games. Violent games do not cause youth to be violent. Instead, youth that are predisposed to be violent seek out violent entertainment. Support for this bill is support for civil liberty.

Negative: For the sake of a civil society, violent video games should not be sold to minors. Violent video games contribute to youth violence. Video games often reward players for simulating violence, and thus enhance the learning of violent behaviors. Studies suggest that when violence is rewarded in video games, players exhibit increased aggressive behavior compared to players of video games where violence is punished. Violent video games teach youth that violence is an acceptable conflict-solving strategy and an appropriate way to achieve one's goals. A 2009 study found that youth who play violent video games have lower belief in the use of nonviolent strategies and are less forgiving than players of nonviolent video games. Support for this bill is an outrage and threatens American culture.

The Seattle Dignity in Death (DID) Euthanasia Law

Positive: Euthanasia should be legalized across the nation. At the Hemlock Society, we get calls daily from desperate people who are looking for someone like Jack Kevorkian to end their lives which have lost all quality. Americans should enjoy a right guaranteed in the European Declaration of Human Rights – the right not to be forced to suffer. It should be considered as much of a crime to make someone live who with justification does not wish to continue as it is to take life without consent. This law provides everyone with freedom and control over their own lives.

Negative: Euthanasia should be outlawed across the nation. If legalized, the elderly may face pressure to 'die and get out of the way.' Also at risk are the poor and minorities, who have been shown to suffer more physical pain than other groups. The handicapped are also at risk of being pressured to choose euthanasia rather than continued treatment, either through direct pressure or inadequate treatment of their pain and suffering. The only way to achieve adequate protection for these groups is to maintain a bright-line against physician-assisted suicide. This law, while well-intentioned, will lead to unforeseen and unacceptable consequences for society.

The Wind Energy Mandate Bill

Positive: Wind-generated electricity is an excellent, environmentally-friendly resource, and states should be encouraged to invest in this energy source. Wind power is currently the most economically competitive form of renewable energy. It provides 15,000 megawatts of power in the US and could provide up to 20 percent of the country's electricity needs. If the US obtains 20 percent of its electricity from wind power by 2020, it will reduce global warming emissions equivalent to taking 71 million cars off the road. Therefore, the Wind Energy Mandate Bill will help safeguard our country’s economic and environmental future.

Negative: The Wind Energy Mandate Bill is a threat to the United States’ economic prosperity and energy security. Wind power costs more than common forms of electric power, and this price gap is actually greater than thought because the federal government subsidizes wind power with production tax credits. Wind farms generate power only when the wind is blowing within a certain range of speed – too little wind and the towers don't generate power, too much wind and they must be shut down for

safety. It is irresponsible to force states to invest in this resource when superior alternatives exist.