

THE EFFECT OF ACTION AND INACTION GOALS ON
THE USE OF COGNITIVE HEURISTICS

by

Christopher Mark Sollars

A thesis submitted in partial fulfillment
of the requirements for the degree

of

Master of Science

in

Psychological Science

MONTANA STATE UNIVERSITY
Bozeman, Montana

April 2010

©COPYRIGHT

by

Christopher Mark Sollars

2010

All Rights Reserved

APPROVAL

of a thesis submitted by

Christopher Mark Sollars

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citation, bibliographic style, and consistency and is ready for submission to the Division of Graduate Education.

Dr. Ian Handley

Approved for the Department of Psychology

Dr. Ruth Striegel-Moore

Approved for the Division of Graduate Education

Dr. Carl A. Fox

STATEMENT OF PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a master's degree at Montana State University, I agree that the Library shall make it available to borrowers under rules of the Library.

If I have indicated my intention to copyright this thesis by including a copyright notice page, copying is allowable only for scholarly purposes, consistent with "fair use" as prescribed in the U.S. Copyright Law. Requests for permission for extended quotation from or reproduction of this thesis in whole or in parts may be granted only by the copyright holder.

Christopher Mark Sollars

April 2010

ACKNOWLEDGEMENTS

Special thanks to Dr. Ian Handley, Dr. Keith Hutchison, and Dr. Dan Gigone.

TABLE OF CONTENTS

1.	INTRODUCTION.....	1
	Action and Inaction Goals	3
	Goals Toward Action and Inaction End States	4
	Supporting Evidence for Action and Inaction Goals	5
	Action Goals and Attitude Formation.....	8
	Action and Inaction Goals and Attitude Change	9
	Unifying the Evidence	11
	Cognitive Heuristics.....	13
	Elaboration Likelihood Model.....	15
	Experiment Overview and Hypotheses.....	16
2.	METHOD	20
	Participants and Design.....	20
	Procedure	20
	Independent Variables	21
	Goal Activation.....	21
	Message Source-Peripheral Cues.....	22
	Secondary Task.....	22
	Manipulation Checks and Dependent Measures.....	23
	Distraction Manipulation Check	23
	Message Source Cue Manipulation Check	23
	Attitudes.....	24
	Thought Listing.....	24
	Processing Measure	25
	Prior Attitudes.....	26
	Need For Cognition.....	26
	Other Measures	27
3.	RESULTS	28
	Distraction Manipulation Checks	28
	Message Source Cue Manipulation Check	29
	Attitudes.....	29
	Thought Listing.....	31
	Processing Measure	32
	Relevance Measure	33
	Exploratory Analyses.....	35

TABLE OF CONTENTS CONTINUED

4.	DISCUSSION	38
	Understanding the Null Effects.....	41
	Distraction.....	41
	Relevance.....	43
	Ceiling Effects	44
	Understanding the Obtained Effects	46
	Future Directions	47
	The Satisfaction of Action Goals.....	50
	Action and Inaction Goals in Explaining Previous Research	51
5.	CONCLUSIONS.....	53
	REFERENCES CITED.....	54
	APPENDIX A: “Miniac” Message.....	57

LIST OF TABLES

Table	Page
1. Attitudes as a Function of Primed Goal, Secondary Task, and Cue	31
2. Proportion of Positive Thoughts and Sum of Thoughts as a Function of Primed Goal, Secondary Task, and Cue	32
3. Processing as a Function of Primed Goal, Secondary Task, and Cue	33
4. Relevance as a Function of Primed Goal, Secondary Task, and Cue	34

ABSTRACT

Cognitive heuristics are “rules of thumb” individuals use to complete a task or arrive at a decision with relatively small amounts of mental effort (Simon, 1990). Therefore, if individuals are effortfully processing information, they might be less likely to rely on cognitive heuristics to make decisions and form judgments. Along those lines, previous research on action and inaction goals has revealed that action-primed individuals rely on effortful or less effortful cognitive processes to form judgments or decisions, depending on the situation. For instance, Albarracin et al. (2008) showed that individuals primed with action (versus inaction) engaged in more effortful thought as evidenced by greater correct recall of a text book passage. However, Albarracin and Handley (2009) demonstrated that individuals primed with action (versus inaction) processed a persuasive message less when they already had a pre-existing attitude toward the message topic. Given that action goals can result in more or less cognitive effort, it appears reasonable to predict that action goals can sometimes lead to more or less reliance on cognitive heuristics. Further, action goals might accentuate the dominant cognitive activity of a given situation. Therefore, action (versus inaction) goals should increase thinking for situations in which individuals think, but increase use of cognitive heuristics in situations in which the default cognitive process is less effortful. The current experiment examined this possibility using a persuasion framework. Specifically, participants were primed with either action or inaction prior to reading a strong message about a fictitious grain product. While reading the message participants were either distracted or not distracted, respectively compromising or leaving intact their ability to think effortfully. Additionally, the ostensible source of the message was either an expert or a non-expert, which served as a cue participants could use in heuristic processing. Reliance on cognitive heuristics was measured by the extent to which participants relied on peripheral cues (i.e., message source) versus message content in the formation of attitudes concerning the topic. However, results revealed no significant differences in attitudes across conditions. Several possible explanations for these null results were identified.

INTRODUCTION

On a daily basis, individuals form judgments and make decisions about a variety of different topics. The judgments and decisions individuals make might be big or small, grand or trivial, simple or complex. However, people do not invest the same amount of effort into every decision. Sometimes individuals devote ample time, energy, and systematic thought to forming a judgment or decision. For example, when deciding whether or not to purchase a particular car, one might invest abundant time thoughtfully considering all of the relevant factors such as cost, gas mileage, and vehicle history. Other times, however, individuals devote little time, energy, or systematic thought in forming judgments and decisions, instead employing mental shortcuts. For example, individuals might base their car-purchasing decision on the extent to which they trust the seller or the general reputation of that particular brand rather than a considered and detailed inspection of the specific vehicle. These mental shortcuts, known as cognitive heuristics, are defined as “methods for arriving at satisfactory solutions with modest amounts of computation” (Simon, 1990, p. 11). More recently, Shah and Oppenheimer (2008) described heuristics as principles individuals use in order to “reduce the effort associated with tasks” (p. 207). Inherent in both definitions is the notion that heuristic principles allow less effortful and systematic processing of information to arrive at a decision or judgment.

Prior research has shown that people are more likely to use heuristics under certain circumstances. For instance, people are more likely to rely on heuristics when distracted from carefully attending to information or when they experience time pressure

to make a decision (De Dreu, 2003; Gilbert & Hixon, 1991; Gilbert, Pelham & Krull, 1988). Robbed of processing capacities by distraction, for example, individuals will fall back on these mental shortcuts to make decisions or form impressions easily. In addition, Petty and Cacioppo (1986), suggest that individuals are more likely to use heuristics when they are not, versus are, motivated to think. For example, if the decision task is not personally relevant, individuals will rely on heuristics to form a judgment, forgoing the need to think carefully about presented information. On the other hand, if the decision task is personally relevant, individuals will rely less on heuristics to form a judgment, and instead think carefully about presented information.

In addition, individuals may hold goals, the fulfillment of which can be accomplished through careful or cursory information processing. In particular, recent research indicates that when people hold the goal to be active they are not only more likely to become physically active but are more likely to engage in effortful thought (Albarracín et al., 2008). Conversely, when individuals hold the goal to be inactive, they are less likely to engage in effortful thought. Conceivably, then, individuals who hold an action goal may be less likely to rely on heuristics to form a judgment or make a decision whereas individuals who hold an inaction goal may be more likely to rely on heuristics to form a judgment or make a decision. The focus of the present research is to examine the influence of action and inaction goals on the use of cognitive heuristics.

Action and Inaction Goals

Albarracin et al. (2008) define *general action* as “motor and/or cognitive output” and *general inaction* as “the lack of action” (p. 510). Action and inaction lie on opposite ends of an activity continuum. The extreme point of the action end includes activities and behaviors requiring concentrated or repeated motor and cognitive processes. The extreme point of the inaction end of the activity continuum is represented by a state of sleep where one is neither moving nor dreaming. According to Albarracin et al., the action end includes a wide variety of activities ranging from the very effortful to the relatively effortless, from the very important to the relatively useless. For example, the action end could include activities such as prolonged and intense studying for an exam, a casual phone conversation, and eating. Importantly, although these actions may result from various specific goals, they are unified insofar as they are actions. Studying for an exam, for example, could be driven by the goal to achieve an “A” in an important class whereas engaging in a casual phone conversation could be driven by the goal to catch up with a friend. The specific goals differ but both are included beneath the umbrella of general action as they both involve cognitive or motor output. Given this, it is interesting to consider that in goal research, goals are induced to influence specific behaviors (Ajzen & Fishbein, 2005), but there could be broader goals that influence behavior more generally. General action and inaction can be thought of as unifying concepts in that acting or not acting are end states in themselves and can be achieved by a variety of different means.

Goals Toward Action and Inaction End States

Albarracin et al. (2008) stated that action and inaction not only represent general activity levels on a continuum but also reflect end states. As such, individuals can hold goals to achieve general action or inaction, much like goals that have been triggered to achieve more specific end states. Thus, general action and inaction goals can influence cognition, behavior, and the selection of behavioral choices in order to achieve active or inactive end states (Albarracin et al.). General action goals will result in more activity (i.e. more motor or cognitive output) and general inaction goals will result in less activity (i.e. less motor or cognitive output). Presumably, when an action (inaction) goal is set, one will choose amongst the available options which could satisfy the action (inaction) goal and correspondingly pursue means to achieve that end state.

If individuals do hold goals to achieve active or inactive end states they should make behavioral choices based on a final outcome despite goal-inconsistent intermediate behaviors. Based on this rationale, one may achieve an active end state via an inactive method and achieve an inactive end state via an active method. For example, “One may rapidly solve a problem now in order to sleep for an extended time afterward or briefly sleep now in order to solve a problem for an extended time afterward” (Albarracin et al., p. 512). This pattern of behavioral choices is to be expected if action and inaction operate as goals rather than mere activated concepts.

Supporting Evidence for Action and Inaction Goals

Albarracin et al. (2008) conducted several experiments demonstrating that priming individuals with action, relative to inaction, leads to greater motor and cognitive output. In one experiment, participants were asked to complete word fragments. Approximately half of the participants completed a set of word fragments containing several that pertained to the concept of action (i.e. “action,” “make,” “go”). The other half completed a set of word fragments containing several that pertained to the concept of inaction (i.e. “pause,” “interrupt,” “calm”). Next, participants were given the option of either resting for two minutes (an inactive task) or doodling on a piece of paper for two minutes (an active task) before moving on to the next experimental phase. Participants primed with action were significantly more likely to choose the active task (doodling) than those primed with inaction. The results supported the hypothesis that individuals primed with action are more likely to choose active versus restful tasks. In another experiment, participants were primed with action or inaction and then given an opportunity to sample grapes from a “new type of plastic container” (Albarracin et al., 2008, p. 515). Those primed with action ate significantly more grapes than those primed with inaction. Thus, the evidence indicates that action-primed individuals will more likely choose active than inactive tasks and will also exhibit greater motor output in the form of eating behavior.

Another experiment demonstrated the effects of action and inaction goals on cognitive outputs. Albarracin et al. (2008) primed participants by supraliminally exposing them to either action or inaction words under the guise of a reaction speed test.

Participants then read a passage taken from an evolutionary psychology book. Subsequently, participants were asked several questions regarding the text in order to measure correct recall of the material. Participants primed with action correctly recalled significantly more of the material than those primed with inaction. The results supported the hypothesis that individuals primed with action will exhibit greater cognitive output than individuals primed with inaction. Thus, given individuals primed with action think more, it is reasonable to hypothesize that they would rely less on heuristics than individuals primed with inaction.

Another experiment conducted by Albarracin et al. (2008) demonstrates that the varying levels of cognitive and motor output in response to action or inaction primes is likely goal-mediated. One feature of goals is that they tend to orient behavior toward maximizing a particular end result. Therefore, if one has an activated action goal he or she will likely make behavioral choices that provide the best opportunity to be active even if this requires an initial period of inactivity. Similarly, if one has an activated inaction goal he or she will likely make behavioral choices that provide the best opportunity to be inactive even if this requires an initial period of activity. With that in mind, Albarracin et al. primed participants with action or inaction using a word-completion task. Next, participants were asked to make an activity choice with the ostensible purpose of clearing working memory prior to proceeding to subsequent tasks. In the experimental condition, participants were given the option of either resting for 30 seconds with 3 minutes of problem-solving to follow or problem-solving for 30 seconds with 3 minutes of rest to follow. If behavioral selections following action and inaction

primes are goal-mediated, those who receive action words should initially choose the short period of rest (30 seconds) in order to obtain a longer period of activity (3 minutes of problem-solving). Likewise, those who receive inaction words should initially choose the short period of problem-solving (30 seconds) in order to obtain a longer period of inactivity (3 minutes of rest). In a control condition, participants were primed with either action or inaction and then simply chose an active or inactive task immediately following the priming procedure. Results showed that control participants chose the active task significantly more often when primed with action (versus inaction), which could be explained by mere concept activation. However, experimental participants primed with action were more likely to choose the option with the longer action task even when obtaining this end required a delay whereas those primed with inaction were more likely to choose the option with the longer inaction task even when obtaining this end required an active behavior. That is, experimental participants displayed sensitivity to the outcome which could conceivably be explained by the activation of goals. Therefore, this experiment provided supporting evidence for the hypothesis that action and inaction primes trigger the activation of goals rather than mere concepts. In summary, Albarracín et al. (2008) demonstrated that action goals (vs. inaction goals) result in the selection of active over restful behavioral options, greater motor activity, and most important to the present research, increased cognitive output.

Action Goals and Attitude Formation

Research on general action and inaction goals in the domain of attitude formation also supports the notion that action goals increase cognitive output. Handley and Albarracin (2010), in Experiment 1, had participants read an informational passage about a recently developed “supergrain.” Initial measures revealed that participants possessed no prior attitude about this fictitious product. Depending on condition, participants were primed with either action or inaction via the completion of word fragments. Next, participants read a strong message either advocating or impugning the grain. Attitude measures were again taken following receipt of the passage. Results showed that participants primed with action formed more favorable attitudes toward the supergrain when they read a favorable versus unfavorable message about that product whereas participants primed with inaction exhibited this effect to a significantly lesser extent. That is, action-primed individuals were more affected by the information than inaction-primed individuals. Given that the information had more impact on action-primed individuals, it appears that they gave more effortful consideration to the passage relative to those primed with inaction. These results are consistent with the prediction that action goals lead to more cognitive output. In addition, action goals increasing cognitive output is consistent with the premise that action-primed individuals rely less on the use of cognitive heuristics.

However, action goals may not always lead to more effortful cognitive activity. Instead, there are conditions under which action goals seem to facilitate less effortful

cognitive activity. Under such conditions then, individuals with activated action goals may in fact rely more on cognitive heuristics.

Action and Inaction Goals and Attitude Change

Much research indicates that individuals' default tendency is to activate a pre-existing attitude (should one exist) when they are asked to report that attitude or encounter information on the attitude object. In addition, research has demonstrated that having an activated prior attitude impedes attitude change by blocking the impact of new information (Cohen & Reed, 2006; Fazio, Ledbetter, & Towles-Schwen, 2000; Glasman & Albarracin, 2006; Priester, Nayakankuppum, Fleming, & Godek, 2004; Schwarz & Bohner, 2001). Further, Albarracin and Handley (2009) suggested that because attitudes function to facilitate behavior, action goals should facilitate attitude retrieval to this end. Thus, in the domain of attitude change, action goals might aid the retrieval of prior attitudes, blocking the impact of new information. If indeed new information is blocked, it would suggest that action-primed individuals are actually processing information less than inaction-primed individuals. Such a finding would indicate that action goals lead to more cognitive activity, independent of whether that activity requires little or much effort.

Albarracin and Handley (2009) demonstrated that action goals facilitate prior attitude retrieval, relative to inaction goals. In Experiment 1, participants were primed with action, inaction, or neutral words (c.f., Albarracin et al., 2008). Next, participants were asked to report their attitude on gun control and response times were recorded. An

initial measure of attitude toward gun control revealed no differences across conditions. But, results indicated that action-primed participants reported their attitudes significantly faster than participants primed with inaction and control words. Additionally, response times in the control condition were significantly faster than response times in the inaction-prime condition. These results support the hypothesis that activated action goals (vs. inaction goals) aid the retrieval of prior attitudes.

In a follow-up experiment, Albarracin and Handley (2009) primed participants, who initially expressed an attitude against vegetarian practices, with action or inaction words. Next, participants were presented with a message containing strong arguments favoring vegetarian practices. This message was designed to induce attitude change and included ostensible scientific evidence. Attitudes were measured both before goals were primed and after receipt of the message. Results indicated that those primed with action exhibited less attitude change than those primed with inaction. In other words, action-primed participants appeared to process the message less than inaction-primed participants and as a result report more negative attitudes. This is consistent with the hypothesis that action goals (vs. inaction goals) block the impact of new information via the facilitation of prior attitude retrieval.

Albarracin and Handley (2009) conducted another experiment to more conclusively determine that those primed with action (vs. inaction) process a persuasive message less carefully. Depending on random assignment, participants were presented with an anti-vegetarianism message containing either strong or weak arguments. After reading the message, participants reported their attitudes regarding vegetarianism.

Attitude scores were compared with the reported attitudes of a control group who did not receive a message. The control group provided an estimate of baseline attitudes. Results showed that participants primed with inaction, but not those primed with action, reported more favorable attitudes in response to strong versus weak arguments. In other words, inaction-primed participants appeared to be sensitive to argument quality indicating they processed the message to a greater extent than action-primed participants.

Overall then, the results of Albarracin and Handley's (2009) experiments indicate that action goals do not always lead to more effortful cognitive activity. Sometimes, action goals can facilitate less effortful cognitive processes such as attitude activation. Thus, rather than action goals increasing effortful cognitive activity under all conditions, action goals might increase the default cognitive activity for a given situation.

Unifying the Evidence

Research examining the effects of action goals on cognitive output appears to be in conflict. On the one hand, Handley and Albarracin (2010) demonstrated that action-versus inaction-primed individuals think more about a message when no prior message-related attitude exists. In other words, action-primed individuals seemed to engage in more effortful processing of the message. As well, Albarracin et al. (2008) found that individuals primed with action, versus inaction, recall more information about an informational passage, again indicating that action goals increase effortful cognitive activity. On the other hand, Albarracin and Handley (2009) found that action-primed individuals (vs. inaction-primed individuals) engaged in the less effortful cognitive

activity of activating an attitude, which inhibited later effortful processing of persuasive information. Thus, it appears that action goals (vs. inaction goals) do not always result in more effortful cognitive activity.

Importantly, these findings are consistent with the idea that action goals enhance default cognitive activities, be they effortful or easy. In the absence of a prior attitude, one will typically think about a persuasive message when required to do so. Action goals may enhance this thoughtfulness (the default cognitive activity) whereas inaction goals will reduce it. This accounts for why Handley and Albarracin (2010) found that individuals primed with action were more affected by a persuasive message than those who were primed with inaction. In contrast, when one is required to report an attitude in response to a persuasive message the default cognitive activity is to retrieve a prior message-related attitude, when one exists (Fazio, Ledbetter, & Towles-Schwen, 2000; Glasman & Albarracin, 2006). Further, this attitude activation blocks the impact of new information. Action goals might accentuate attitude retrieval explaining why Albarracin and Handley (2009) found that those primed with action exhibited less attitude change than those primed with inaction. So, when activating an attitude is normal and possible, action goals should facilitate the easy cognitive activity of retrieving an attitude, which results in less effortful processing of subsequent attitude-relevant information. Overall then, action goals are likely to prompt cognitive activity, but whether that activity is effortful or fairly easy may depend on which activity is default in the context. For example, simply activating an attitude is the default when individuals hold an attitude, but thinking about information is the default when individuals do not hold an attitude

about a topic and must first form one in order to report their attitude. Extending this idea, action goals may sometimes increase effortful cognitive activities and thus decrease the use of heuristics, but at other times increase easy cognitive activities such as heuristics to forgo effortful cognitive processes. Whether effortful thinking or heuristic use is the default may depend on context. Indeed, research shows that the extent to which heuristics are used is situationally determined.

Cognitive Heuristics

Prior research indicates that reliance on cognitive heuristics increases under conditions of impoverished cognitive capacities (Dijker & Koomen, 1996; Gilbert & Hixon, 1991; Gilbert, Pelham, & Krull, 1988). Presumably, depleted cognitive capacities hinder one's ability to process information in a careful, systematic manner. Heuristics then become a relatively more important means for judgment and decision making, allowing one to render decisions easily, without careful thought. For example, Kiesler and Mathog (1968) diminished the cognitive capacities of half of their participants by distracting them as they rendered decisions. Following exposure to tape-recorded communications, participants were asked to form judgments about those communications. Participants listened to communications from a high credibility communicator (i.e., a medical doctor) or a low credibility communicator (i.e., a high school drop out). Kiesler and Mathog found that distracted participants, relative to non-distracted participants, were more influenced by the credibility of the communicator than the content of the message. In other words, distracted participants were more likely to

form a judgment via a cognitive heuristic (i.e., experts are always right) than by effortfully processing the communication. Similarly, Gilbert and Hixon (1991) found that distracted (versus non-distracted) participants were more likely to employ stereotypes when making trait ratings of an Asian target. That is, distracted participants appeared to judge an Asian target based on preconceived notions of Asian people rather than on unique characteristics of the individual. Asian stereotypes, then, acted as a low-effort heuristic allowing participants to make a judgment without systematic consideration of the individual. These studies illustrate that there are conditions in which individuals will not effortfully process information but instead will rely on mental shortcuts to arrive at judgments and decisions. Overall, the use of heuristics is frequent and common (Tversky & Kahneman, 1974), but the extent of heuristic use can be magnified by factors that limit the cognitive capacity of the decision-maker. That is, individuals are more likely to respond to a task using heuristics in situations which limit their ability to think effortfully about a task.

Based on these ideas, it is predicted that action goals magnify the use of heuristics when reliance on heuristics is the default cognitive activity. Similarly, action goals are predicted to promote effortful thought when less reliance on heuristics is the default cognitive activity. The aim of the present research is to test these predictions. One way to test these predictions is through the use of a persuasion paradigm, which allows one to determine the degree of attitude change following receipt of persuasive communications. The Elaboration Likelihood Model (Petty & Cacioppo, 1986) provides an effective

framework for determining if action goals accentuate the typical cognitive activity of a given situation.

Elaboration Likelihood Model

According to the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986) and related persuasion frameworks, persuasion can occur by more or less effortful means. The ELM suggests that when one is motivated and able to process a persuasive message, they will think carefully about that message and, as a result, form more favorable attitudes in response to messages composed of strong versus weak arguments. That is, when individuals are motivated and able to think, their attitudes will be thought mediated. In this case, the quality of a presented message serves as the primary basis for individuals' reported attitudes. On the other hand, if one is either unmotivated or unable to carefully process a persuasive message, attitude formation or change is more heavily influenced by aspects that are tangential or irrelevant to the message rather than by message content. For example, heuristics or peripheral cues such as perceived credibility of the message source will play a larger persuasive role if one is distracted (unable to carefully process) or the message is not personally relevant (unmotivated to carefully process). In other words, attitude formation or change occurs more effortfully when one is motivated and able to think, but less effortfully when one lacks either motivation or ability to think carefully.

Given the above discussion, individuals who are distracted should be more persuaded by peripheral cues such as source credibility than by the strength of a message.

Therefore, if action goals enhance default cognitive activity, distracted individuals primed with action should be more persuaded by peripheral cues than distracted individuals primed with inaction. However, when processing capacity is left intact, one is able to process the contents of a message. Therefore, individuals who are not distracted should be less persuaded by peripheral cues and persuasion will be predominantly based on message qualities. Again, if action goals enhance default cognitive activity, non-distracted individuals primed with action should be less persuaded by peripheral cues, and more persuaded by argument qualities, than those primed with inaction.

Experiment Overview and Hypotheses

Via random assignment, participants were primed with either action or inaction goals and presented with a message ostensibly delivered by either an expert or a non-expert. Participants read the message while either distracted or not distracted by a secondary task. The message contained information favoring a fictitious “supergrain,” and included strong arguments. Given the grain is entirely fictitious, participants were not expected to have a prior attitude (either positive or negative) regarding the presented information. After reading the message, participants completed attitude measures as well as measures of thinking, relevance, and processing effort. According to the ELM, participants should form attitudes via message strength when not distracted and via peripheral cues when distracted. These effects should be exaggerated among participants primed with action goals versus those primed with inaction goals. In addition, the message was designed to not be particularly relevant or irrelevant to participants. Even

though the ELM predicts that individuals will think more effortfully if personally motivated to process a message, it is assumed that participants will possess enough motivation to process the message given the demands of the experiment. That is, participants should exert some effort into processing the presented message by virtue of being asked to form an attitude about the message topic. In fact, Handley and Albarracin (2010) did not manipulate relevance in Experiment 1 and still found that action-primed individuals were more influenced by the message relative to inaction-primed individuals. This indicates that the action primes provided sufficient motivation for participants to process the message independent of a relevance manipulation.

Hypothesis 1: In the no-distraction conditions, participants primed with action will form favorable attitudes toward the message regardless of message source. Participants primed with inaction will form more favorable attitudes when the source of the message is an expert than when the source of the message is a non-expert.

Prior research suggests that action-primed individuals think more and are persuaded by more effortful means when no prior attitude exists (Albarracin et al., 2008; Handley & Albarracin, 2010). By extension then, individuals primed with action goals should not use peripheral cues as a basis for reporting their attitudes. On the other hand, being less motivated to think, inaction-primed individuals are more likely to rely on less effortful means such as heuristics when forming attitudes. It is predicted that this less effortful approach will be reflected in inaction-primed participants forming attitudes based on message source rather than message content.

Hypothesis 2: In the distraction conditions, individuals will form more favorable attitudes when the source of the message is an expert than when the source of the message is a non-expert. Further, relative to those primed with inaction, action-primed individuals will form even more favorable attitudes when the source of the message is an expert and will form even less favorable attitudes when the source of the message is a non-expert.

Individuals tend to rely on heuristics to form attitudes when they are distracted from thinking about a message. Therefore, if action goals enhance default cognitive activity then distracted individuals primed with action should rely on heuristics even more than individuals primed with inaction. It is predicted that this will be reflected in action-primed participants forming attitudes based on message source to an even greater extent than inaction-primed participants while under conditions of distraction.

Hypothesis 3: Action-primed participants in the no-distraction conditions will generate a higher proportion of positive thoughts than inaction-primed participants. In the distraction conditions, participants primed with action will generate a lower proportion of positive thoughts than participants primed with inaction. Additionally, action-primed participants in the no-distraction conditions will, overall, generate a greater number of thoughts than inaction-primed participants. In the distraction conditions, participants primed with action will, overall, generate fewer thoughts relative to participants primed with inaction.

Thought-listing provides a way of measuring the amount of thought as well as the proportion of favorable thoughts about a message. In regard to proportion of favorable

thoughts, Petty and Cacioppo (1986) verified that when individuals thought carefully about presented messages, they generated a higher proportion of favorable thoughts when the messages contained strong versus weak arguments. Therefore, if action-primed individuals think more about the message in the no-distraction conditions, and less about the message in the distraction conditions, a higher proportion of positive thoughts should be generated in the former, relative to inaction participants. Along those lines, a lower proportion of favorable thoughts should be generated by inaction-primed participants in the distraction (versus no-distraction) conditions. In addition, the message used in the current experiment was pre-tested such that individuals who thought carefully about it generated a higher proportion of positive thoughts (Handley & Albarracin, 2010).

METHOD

Participants and Design

Male and female undergraduate psychology students attending Montana State University received course credit for their participation in this experiment. Participants were randomly assigned to conditions in a 2 (goal: action vs. inaction) x 2 (secondary task: distraction vs. no distraction) x 2 (cue: expert vs. non-expert) factorial design.

Procedure

All experimental procedures were conducted with computers using Medialab software (Jarvis, 2004). Participants were told that the purpose of the experiment was to investigate how verbal ability affects reactions to a message. After participants read and signed informed consent documents, the experiment unfolded in three phases.

In phase one, participants were primed with either an action or inaction goal via random assignment. With the ostensible purpose of measuring verbal ability, participants completed several word fragments. Many of these word fragments pertain to the concepts of action or inaction, depending on condition (see Albarracin et al., 2008).

In phase 2, all participants were presented with a message about a “supergrain” product. The message contained strong arguments, ostensible scientific evidence, and was designed to persuade participants to form a favorable attitude toward the product. For example, the passage stated that the grain contains high levels of protein and holds the potential of curbing famine. This message has been pre-tested and used in prior research (e.g., Handley & Albarracin, 2010). Depending on random assignment, participants were

told that the source of the message was either an expert (e.g., Harvard professor) or a non-expert (e.g., high school student). In addition, random assignment determined whether or not participants read the message while simultaneously performing a secondary distracter task.

In phase three, participants completed all manipulation checks and dependent measures. Manipulation checks determined if participants felt sufficiently distracted in the distraction condition. A separate manipulation check determined if participants were aware of the source (expert or non-expert) of the message. In addition, participants responded to items measuring effort exerted in reading the message, perceptions of message relevance, and how carefully the message was read. Primary dependent measures included questions concerning the formation of attitudes about the grain product in addition to the number of generated message-related thoughts.

Independent Variables

Goal Activation

Participants were told that because their reactions to a message could be influenced by their verbal ability, they would initially complete a verbal-ability task. This task was the same as that used by Albarracin et al. (2008), in which participants completed 24 partial words by filling in letters. A subset of these words either related to action or inaction for the purpose of priming these respective goals. Specifically, depending on random assignment, eight of these words related to action (“motivation,”

“doing,” “behavior,” “engage,” “action,” “make,” “go,” and “active”) or inaction (“still,” “pause,” “interrupt,” “calm,” “freeze,” “unable,” “stop,” and “paralyze”).

Message Source-Peripheral Cues

The ostensible source of the message depended upon random assignment. About half of the participants received a message they were told was written by a Harvard professor (i.e., an expert), whereas the other half received a message they were told was written by a high school student (i.e., a non-expert). This manipulation has been used in previous research (e.g., Petty, Cacioppo, & Goldman, 1981) and shown to be effective. The source of the message was provided just before the presentation of the message. Specifically, participants in the expert conditions were told that “the following essay was written by a PROFESSOR AT HARVARD UNIVERSITY.” Participants in the non-expert conditions were told that “the following essay was written by a HIGH SCHOOL STUDENT.”

Secondary Task

In the distraction condition, participants were instructed to rehearse an eight-digit number while reading the message. The number (63489672) was provided to participants in the distraction conditions after receipt of the message source under the pretense of exploring how “individuals perform dissimilar tasks at the same time.” This secondary task was designed to impoverish the participants’ processing capacities and has been used effectively to that end in prior research (e.g., Gilbert & Hixon, 1991). Participants in the no-distraction condition read the message in the absence of a secondary task of any kind.

Manipulation Checks and Dependent Measures

After reading the message, participants completed several items assessing responses to the message and the independent variables. In addition, participants were asked to provide demographic information. Most important, participants were presented items that specifically measured attitudes toward the topic of the message. Also, participants were asked to report any thoughts they might have had while reading the message.

Distraction Manipulation Check

A distraction-manipulation-check item asked participants to respond to the question “How much were you able to concentrate on the message you read?” on a scale anchored by 1 (*not at all*) to 9 (*very much*). Further, after participants read the message in the distraction condition, they were asked to produce the eight-digit number they were given to memorize. The purpose of producing the eight-digit number was to test whether participants were effectively distracted by this secondary task. If participants produced an incorrect number, the possibility exists that they were not sufficiently distracted.

Message Source Cue Manipulation Check

A message-source manipulation check was created by assessing participants’ responses to the stem “The source of the message was:” 1 (*a high school student*) or 2 (*a Harvard professor*). Participants were asked to respond to this item toward the end of the

experiment to determine if they recalled, and therefore, were likely affected by the peripheral cue.

Attitudes

After reading the message, participants answered five items designed to measure their attitudes about the “supergrain” product. Specifically, participants responded to the stems “The grain product is:” on five separate scales anchored from 1 (*bad, negative, harmful, foolish, unfavorable*) to 9 (*good, positive, beneficial, wise, favorable*).

Participants’ responses to the attitude items were averaged to form a single attitude measure. Higher scores indicate more positive attitudes toward the message. These five items demonstrated high internal consistency (*Cronbach’s $\alpha = .91$*).

Thought Listing

After reading the message, participants were asked to list any thoughts they had while reading the message. Specifically, participants were instructed to “Write down all of the thoughts that went through your mind as you read the essay. Thoughts could be about what the essay said, what it would mean to you, or about anything else that happened to come to mind while you were reading the essay.” Two coders independently coded the thought-listing data in order to determine both the proportion of positive message-related thoughts and the sum of message-related thoughts. The coders determined if a thought was related (or irrelevant) to the message, and rated each message-related thought as positive, negative, or neutral. Coders were instructed to code a thought as neutral unless it was clear to them that the thought was favorable or

unfavorable toward the message topic. For each participant, the total number of negative message-related thoughts was subtracted from the total number of positive message-related thoughts. The resulting number was divided by the total number of message-related thoughts to create a measure of the proportion of positive thoughts. Coders agreed on the classification of the message-related thoughts 78% of the time and discrepancies in coding were resolved by discussion between the two coders. Given that the message contains strong arguments and has been pre-tested to inspire positive thoughts when individuals think carefully about it, a higher proportion of positive thoughts generated is consistent with more effortful processing. In addition, the sum of participants' message-related thoughts was examined as a global measure of how much participants thought about the message.

Processing Measure

After completing the primary dependent measures participants also responded to two items measuring the extent to which they processed the message. Specifically, participants responded to the items “How much were you able to concentrate on the essay you read?” and “How much did you actually think about the arguments while you read the essay?” on scales anchored from 1 (*not at all*) to 9 (*very much*). Participants' responses to the processing measures were averaged to form a single processing measure. Higher scores indicate more message processing. The two items were highly correlated, $r = .69, p < .01$.

Prior Attitudes

Because this experiment attempts to assess attitude formation, it was important that participants not hold a prior attitude concerning the message topic. Therefore, participants were asked prior to reading the message if they held an attitude toward the supergrain product, Miniac. Only participants who reported that they did not have an attitude were retained in the data set. Therefore, eighteen participants were excluded from the analysis for reporting having a prior attitude about Miniac and 202 participants were retained for not reporting a prior attitude. Primary analyses yielded comparable results with these participants retained in analyses.

Need for Cognition

At the end of the experimental session participants responded to items measuring Need for Cognition (NFC). NFC measures participants' enjoyment of, and propensity to engage in, effortful cognitive processing (Cacioppo & Petty, 1982). That is, individuals high (versus low) in NFC tend to chronically process information in an effortful manner. Specifically, participants responded to nineteen items such as "I really enjoy a task that involves coming up with new solutions to problems" and "I prefer my life to be filled with puzzles that I must solve" on scales anchored from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*). Participants' responses to the NFC items were averaged to form a single NFC measure. Higher scores indicate a greater level of NFC. NFC was included in the experiment for exploratory purposes.

Other Measures

Participants also responded on 9-point scales to items measuring motivation: “To what extent did you make an effort to think about the message while reading it?” 1 (*not at all*) to 9 (*very much*), and relevance: “To what extent was the message relevant to you personally?” 1 (*not at all*) to 9 (*extremely*).

RESULTS

Distraction Manipulation Checks

To test if participants' ability to process the message was effectively compromised by the distracter task, the distraction manipulation-check item was entered into a 2 (goal: action vs. inaction) x 2 (secondary task: distraction vs. no distraction) x 2 (cue: expert vs. non-expert) between-subjects analysis of variance (ANOVA). This analysis yielded a main effect of secondary task, $F(1, 194) = 4.25, p = .04$, (all other F s < 1.95 and p s > .16). This effect indicates that participants who were required to memorize the eight-digit number while reading the message were less able to concentrate on the message ($M = 5.76, SD = 2.09$) relative to non-distracted participants ($M = 6.30, SD = 1.85$).

Also, chi-square tests were conducted to assess whether accurate recall of the eight-digit number differed between conditions. The initial test indicated that participants in the expert and non-expert conditions correctly recalled the eight-digit number to the same extent, $X^2(1, N = 114) = .18, p = .67$. However, an additional chi-square test indicated that action and inaction individuals correctly recalled the eight-digit number to a different extent. Specifically, when asked to produce the eight-digit number, action-primed participants accurately recalled the number significantly more often than inaction-primed participants, $X^2(1, N = 114) = 10.24, p = .001$. In fact, inaction-primed participants incorrectly recalled the eight-digit number nearly as often as they correctly recalled the number ($P = .48$) whereas action-primed participants were more likely to

correctly recall the eight-digit number ($P = .80$). This difference in recall suggests that the prime manipulation influenced the effectiveness of the distraction manipulation.

Message Source Cue Manipulation Check

Chi-square tests were conducted to assess whether there were significant differences between conditions in accurate recall of the message source. An initial test revealed that participants in the expert and non-expert conditions correctly recalled the message-source to the same extent, $X^2(1, N = 202) = .10, p = .75$. Another test also revealed that participants in the action and inaction conditions correctly recalled the message-source to the same extent $X^2(1, N = 202) = .46, p = .50$. However, an additional chi-square test revealed a significant difference in correct recall of the message-source between distracted and non-distracted participants, $X^2(1, N = 202) = 3.96, p = .05$. In fact, non-distracted participants always correctly recalled the message source ($P = 1$) whereas distracted participants were significantly less likely to correctly recall the message-source ($P = .96$). Although only five participants total incorrectly reported the message source, this difference in recall suggests that the distraction manipulation may have influenced the effectiveness of the cue manipulation.

Attitudes

Participants' responses to the attitude measure were entered into a 2 (goal: action vs. inaction) x 2 (secondary task: distraction vs. no distraction) x 2 (cue: expert vs. non-expert) between-subjects ANOVA. None of the main effects or two-way interactions

achieved significance, all $F_s < 2.14$ and $p_s > .15$. The precise nature of the predicted three-way interaction between goal, distraction, and cue was tested using planned comparisons. This comparison was constructed to determine if individuals primed with inaction goals generally, and action goals while distracted, formed more favorable attitudes in response to an expert versus a non-expert message source. Specifically, action-primed participants were assigned a weight of 0 in the no distraction conditions, whereas in all other cases participants were assigned a weight of -1 if they read a message by a non-expert source, and a 1 if they read a message by an expert source. This comparison was not significant, $t(194) = .105, p > .05$ (see Table 1 for means and standard deviations for the attitude measure). To test for partial support of the forwarded hypotheses, simple effects tests were conducted to assess whether there was a difference between participants exposed to an expert versus non-expert source in each combination of goal prime and distraction condition. For example, in the no distraction condition, participants primed with inaction were assigned weights of 1 and -1 if they ostensibly received a message from a Harvard professor or high school student, respectively. Weights of 0 were assigned to all other conditions. None of the comparisons attained significance, all $t_s(194) < 1.20, p_s > .23$. Overall, the attitude measure did not support Hypotheses 1 or 2.

Table 1

Means for Attitudes as a Function of Primed Goal, Secondary Task, and Cue

	Distraction		No Distraction	
	Action	Inaction	Action	Inaction
Expert	7.96(1.10)	7.58(1.20)	7.41(1.53)	8.04(0.96)
Non-expert	7.95(1.10)	7.91(1.06)	7.71(1.26)	7.65(1.46)

Note: Numbers in parentheses represent standard deviations.

Thought-Listing

Participants' proportion of positive thoughts was entered into a 2 (goal: action vs. inaction) x 2 (secondary task: distraction vs. no distraction) x 2 (cue: expert vs. non-expert) between-subjects ANOVA. This analysis yielded no significant results, all $F_s < 1.12$, $ps > .29$.

The sum of participants' thoughts was also examined as a global measure of how much participants thought about the message. Participants' total number of thoughts was entered into the same between-subjects ANOVA used above. This analysis also yielded no significant results, all $F_s < 1.93$, $ps > .17$. In sum, the analyses for both thought measures failed to yield results supportive of Hypothesis 3.

Table 2

Proportion of Positive Thoughts and Sum of Thoughts as a Function of Primed Goal, Secondary Task, and Cue

	Distraction		No Distraction	
	Action	Inaction	Action	Inaction
Proportion of Positive Thoughts				
Expert	.33(.52)	.34(.52)	.24(.77)	.42(.49)
Non-expert	.31(.44)	.23(.55)	.27(.56)	.21(.52)
Sum of Thoughts				
Expert	5.11(2.54)	4.17(2.06)	4.63(2.78)	4.70(2.30)
Non-expert	5.20(2.76)	4.54(2.41)	4.83(2.55)	5.22(2.98)

Note: Numbers in parentheses represent standard deviations.

Processing Measure

Participants' responses to the processing measure were entered into the same ANOVA used above. The ANOVA revealed a significant main effect of distraction, $F(1, 194) = 4.59, p = .03, \eta_p^2 = .02$, indicating that non-distracted participants reported processing the message significantly more ($M = 6.01, SD = 1.78$) than distracted participants ($M = 5.45, SD = 1.88$). In addition, the interaction between secondary task and goal achieved marginal significance $F(1, 194) = 3.27, p = .07$ (no other effects were significant, all $F_s < 1.65$, all $p_s > .20$). Puzzlingly, this interaction indicates that individuals in non-distraction conditions reported processing the message more when primed with inaction ($M = 6.38, SD = 1.69$) versus action ($M = 5.67, SD = 1.82$), whereas individuals in distraction conditions reported processing the message more when primed

with action ($M = 5.63$, $SD = 1.97$) versus inaction ($M = 5.34$, $SD = 1.81$). This pattern of results is strange given it runs contrary to the logic behind the hypotheses. That is, action-primed individuals were generally expected to engage in more effortful processing when not distracted, but less effortful (and more heuristic) processing when distracted.

However, it can perhaps be explained via examination of responses to the relevance measure.

Table 3

Means for Processing as a Function of Primed Goal, Secondary Task, and Cue

	Distraction		No Distraction	
	Action	Inaction	Action	Inaction
Expert	5.68(1.89)	5.10(1.86)	5.48(1.92)	6.55(1.44)
Non-expert	5.57(2.09)	5.58(1.77)	5.94(1.68)	6.24(1.89)

Note: Numbers in parentheses represent standard deviations.

Relevance Measure

The message was not intended to be particularly relevant or irrelevant to individuals. However, participants' rating of message relevance ($M = 5.58$) was significantly greater than the midpoint of the scale, $t(201) = 3.52$, $p = .001$. With that in mind, participants' responses to the relevance measure were entered into a 2 (goal: action vs. inaction) x 2 (secondary task: distraction vs. no distraction) x 2 (cue: expert vs. non-expert) between-subjects ANOVA. The ANOVA revealed only a significant interaction between secondary task and goal $F(1, 194) = 3.79$, $p = .05$, $\eta_p^2 = .02$ (all other F s < 1.14 , p s $> .29$). This interaction indicates that non-distracted participants primed with inaction

found the message more personally relevant ($M = 5.75$, $SD = 2.51$) than non-distracted participants primed with action ($M = 5.47$, $SD = 2.34$), whereas distracted participants primed with inaction found the message less personally relevant ($M = 5.02$, $SD = 2.55$) than distracted participants primed with action ($M = 5.77$, $SD = 2.23$). This pattern of means mirrors the pattern observed from the processing measure. That is, it appears that the more relevant participants found the message the more they reported processing the message. This makes sense given that a basic premise of the ELM is that individuals will more effortfully process information if they are motivated to do so. Therefore, if individuals in this experiment found the message to be personally relevant their effort in processing the message could have increased correspondingly. However, the reasons for this interaction are unclear. For example, it is mysterious as to why non-distracted participants primed with inaction would find the message more relevant relative to distracted participants primed with action. Unfortunately, previous research does not clarify the matter and this result may be spurious.

Table 4

Means for Relevance as a Function of Primed Goal, Secondary Task, and Cue

	Distraction		No Distraction	
	Action	Inaction	Action	Inaction
Expert	5.61(2.50)	5.46(2.41)	5.37(2.31)	6.00(2.00)
Non-expert	5.97(1.88)	4.58(2.65)	5.61(2.45)	6.09(2.60)

Note: Numbers in parentheses represent standard deviations.

Exploratory Analyses

Additional analyses were conducted to further explore the data. In particular, it was important to analyze the Need for Cognition (NFC) measure. NFC measures participants' enjoyment of, and propensity to engage in, effortful cognitive processing. Individuals high (versus low) in NFC tend to chronically process information in an effortful manner. Thus, high NFC participants may have effortfully processed the message and been fairly unaffected by the goal prime. On the other hand, low NFC participants, because they do not chronically process information effortfully, may exhibit a greater sensitivity to the goal prime, processing information more effortfully in response to an action (versus inaction goal). Therefore, hypotheses may find support only from participants who do not chronically engage in effortful cognitive processing (i.e., participants low in NFC). To test this premise, a median split was conducted on the NFC variable to identify both participants high and low on this measure. Participants' responses to the attitude measure were then entered into a 2 (NFC: high vs. low) x 2 (goal: action vs. inaction) x 2 (secondary task: distraction vs. no distraction) x 2 (cue: expert vs. non-expert) between-subjects ANOVA. This analysis revealed a significant two-way interaction between NFC and secondary task, $F(1, 186) = 13.32, p = .003, \eta_p^2 = .05$. The pattern of this interaction suggests that individuals who were high in NFC formed more favorable attitudes when distracted ($M = 7.90, SD = 1.05$) than when not distracted ($M = 7.19, SD = 1.33$), whereas individuals who were low in NFC formed equally favorable attitudes regardless of whether they were distracted ($M = 7.79, SD = 1.17$) or not distracted ($M = 8.05, SD = 1.24$). This pattern is odd in that it seems more

likely that high NFC participants, because they chronically engage in more effortful processing, would form equally favorable attitudes toward a strong message in both the distraction and no-distraction conditions. If anything, they should form less favorable attitudes when distracted (versus not distracted) if the distraction task effectively inhibits their ability to process the message, resulting in a reversal of the pattern that was actually revealed. One possible explanation for this finding is that high NFC participants may have been more likely to counter-argue the message. Thus, the distraction task could have interrupted opposing thoughts, ironically resulting in more favorable attitudes relative to the no-distraction conditions. Nonetheless, this result is difficult to interpret and does not bear on any of the proposed hypotheses. The ANOVA yielded no other significant results, (all F s < 3.51, p s > .06) indicating no support for Hypotheses 1 or 2.

As an alternative method of exploring effortful message processing, the amount of time participants spent reading the essay was recorded. This variable was entered into a 2 (goal: action vs. inaction) x 2 (secondary task: distraction vs. no distraction) x 2 (cue: expert vs. non-expert) between-subjects ANOVA. This analysis revealed a significant interaction between secondary task and goal, $F(1, 194) = 4.80, p = .03, \eta_p^2 = .02$ (all other F s < 1.31, p s > .28), indicating that participants in the non-distraction conditions read the message more quickly in the inaction versus action conditions, whereas participants in the distraction conditions read the message more quickly in the action versus inaction conditions. These results are intriguing if time spent reading the message is truly reflective of effortful processing. That is, non-distracted action-primed participants appeared to process the message more than non-distracted inaction-primed participants.

This makes sense if an action goal (versus an inaction goal) increases effortful cognitive activity. Additionally, distracted action-primed participants appeared to process the message less than distracted inaction-primed participants. This also makes sense if individuals with action goals (versus inaction goals) rely more heavily on cognitive heuristics when heuristic use is the default cognitive activity (i.e., when distracted). However, this increased reliance on heuristics among action-primed participants in the distraction condition was not born out on the attitude measure.

DISCUSSION

Prior research on action and inaction goals has revealed seemingly contradictory findings with regard to cognitive output. Some research indicates that individuals engage in more effortful cognitive activity when reading text (Albarracin et al., 2008) and while reading persuasive information if they hold an action versus inaction goal. For example, when individuals lack a prior message-related attitude, they form more favorable attitudes following a message supporting rather than opposing a particular topic, especially if they hold action goals (Handley & Albarracin, 2010). Conversely, when individuals hold a prior message-related attitude, action goals appear to result in less effortful information-processing relative to inaction-primed individuals (Albarracin & Handley, 2009). For example, individuals report more favorable topic attitudes after reading strong versus weak arguments in favor of a topic, particularly while holding an inaction versus action goal. One possible explanation for these seemingly inconsistent findings is that action goals enhance the default cognitive activity of a given situation, irrespective of effort. That is, action goals might increase effortful cognitive activity when doing so is the default in a situation (e.g., one is forming an attitude about a novel topic), but increases other, less effortful, cognitive activities when those are the default in a situation (e.g., activating prior attitudes). Consistent with that idea, action-goals may produce more or less reliance on heuristics. Specifically, action goals may increase effortful thought (and lessen the use of heuristics) when such thought is normative or possible, but amplify the use of heuristics when conditions determine that heuristic use is the default cognitive activity.

The present research used a persuasion framework to test this possible explanation for the paradoxical effects of action goals. In this experiment, participants were exposed to action- or inaction-related words to prime those respective goals. Next, participants were told that they would soon read a message about a grain product, supposedly written by a Harvard professor or a high school student. The source of the message was manipulated to serve as a positive or negative cue for use in heuristic processing. Next, via random assignment, some participants were asked to memorize an eight-digit number, serving as a manipulation of distraction. In so doing, about half of the participants should have been distracted from carefully thinking about the forthcoming message, and therefore based their attitudes on easy to process cues rather than the message merits. Next, participants read a strong message in favor of a fictitious grain product and then reported their thoughts and attitudes (as well as exploratory measures) regarding the message topic.

Hypothesis 1 predicted that in the no-distraction conditions, participants primed with action would form favorable attitudes toward the message regardless of message source whereas participants primed with inaction would form more favorable attitudes when the source of the message was an expert versus a non-expert. However, the data did not support this hypothesis. Specifically, in the no-distraction conditions neither action- nor inaction-primed participants demonstrated sensitivity to the message source when forming message-related attitudes. Instead, action- and inaction-primed participants formed favorable attitudes that did not differ between expert and non-expert conditions. Curiously, results in the no-distraction conditions do not corroborate Handley and

Albarracin's (2010) research suggesting that action goals increase message-related effortful processing relative to inaction goals. Unlike the results from Handley and Albarracin's research, participants were not more influenced by the message in action versus inaction conditions under non-distracting conditions. Related, without distraction, participants did not seem to base their attitudes on the peripheral cues (expertise) in either the action or inaction conditions, indicating that both groups thought about the message to a comparable extent. It is possible that inaction-primed individuals did not exhibit sensitivity to the cue because of the strength of the message. That is, the message may have contained arguments compelling enough to override the expected reliance on message source among participants with inaction goals. So, if the message was obviously supportive of the grain product, participants might not have had to process the message carefully to notice that favoring the topic was warranted. Therefore, they did not need to use the cues.

Further, according to Hypothesis 2, participants in the distraction conditions were expected to form more favorable attitudes if they read a message by an expert versus a non-expert source, especially when they held an action goal. However, there was no evidence suggesting that participants in any condition based their attitudes on this cue. This finding is particularly odd given much research supporting the ELM finds that individuals tend to base their attitudes on peripheral cues when they are unable to process a message (e.g. are distracted). So, these null results fail to replicate even well-established findings (Wegener & Petty, 1998).

Finally, the thought-listing data did not support Hypothesis 3 which predicted that action- versus inaction-primed participants would generate a higher proportion of positive thoughts in the no-distraction conditions and a lower proportion of positive thoughts in the distraction conditions. In fact, the proportion of positive thoughts (and sum of all message-related thoughts) generated by participants did not significantly differ across conditions. Again, these results are strange in light of ELM research indicating that individuals generate more positive thoughts about a strong message when they are unhindered versus hindered from processing a message. Once more, these null results fail to replicate well-established persuasion findings (Wegener & Petty, 1998).

Understanding the Null Effects

Distraction

Although difficult to precisely determine the reasons for why hypotheses were not supported, there are some intriguing possibilities. First, the pattern of results on the attitude measure in the distraction conditions suggests that the distraction task did not operate in the predicted fashion. Action- and inaction-primed participants in the distraction condition formed favorable attitudes that did not significantly differ between expert and non-expert conditions. This result is unusual considering previous research indicating that individuals will rely to a greater extent on peripheral cues when distracted during message processing (Kiesler & Mathog, 1968). Given participants did not use the source cues more while distracted suggests that the distraction manipulation might not have been very effective. Further, the distraction manipulation might have been

particularly ineffective for those in the action conditions. That is, possessing an action goal might have allowed individuals to overcome the distraction and maintain the effortful processing of message content.

Indeed, action and inaction individuals correctly recalled the eight-digit number to a different extent. Specifically, action-primed participants accurately recalled the distracter item significantly more often than inaction-primed participants. This difference in recall suggests that the prime manipulation influenced the effectiveness of the distraction manipulation. Although the distraction was also not effective for inaction-primed participants, this unintended influence between manipulations could be responsible for why the distraction task did not produce the predicted effects on action-primed participants. Given action-primed participants correctly recalled the distracter number to a greater extent, it is possible they were actually more distracted than inaction-primed participants. However, if this were true, action-primed participants should have based their attitudes on the source cue even more than inaction-primed participants, and there was no evidence for that in the current experiment. Alternatively, it is possible that the better recall of the distracter by action-primed participants indicates a greater ability to process information. That is, action- versus inaction-primed participants may have greater cognitive resources activated and were thus better able to both rehearse the distracter item and process the persuasive message. As a result, they did not need to employ cognitive heuristics to form attitudes, and were therefore not influenced by source information. Essentially, action-primed participants recalled the distracter item

better, but holding that item in working memory did not sufficiently compromise their ability to process the message.

So, given that action and inaction goals reliably interacted with the distraction task, future testing of these hypotheses requires the employment of a different type of distracter. The distracter task used in the current experiment required participants to actively rehearse information (i.e., the eight-digit number). In retrospect, this might be problematic given that goal primes also affect cognitive processing. More specifically, individuals primed with action versus inaction might have better rehearsed the distracter item because doing so would satisfy their goal to engage in more cognitive output. As a result, this type of “active” distracter task was differentially effective for participants depending on what goal they had primed. Fortunately, it remains possible that a passive distracter (i.e., one that does not require active processing) such as an audio recording might allow the goal and distraction manipulations to remain truly independent. Specifically, a passive distracter could serve the purpose of impoverishing cognitive capacities but without requiring processing effort on the part of the participant. Therefore, the current hypotheses could again be tested in a similar experiment using passive distracters like noise, rather than distracters that require cognitive activity. Thus, one reason the experiment did not support the current hypotheses was due to the methodology rather than casting significant doubt on the hypotheses themselves.

Relevance

Also, perceived relevance of the message was influenced by independent variables in the experiment, meaning that participants’ motivation to process the message

was not equitable across conditions. In fact, the analysis of the relevance measure revealed a significant interaction between secondary task and goal. This interaction indicates that in the no-distraction conditions, inaction-primed individuals found the message more personally relevant than did action-primed individuals whereas the opposite was true in the distraction conditions. Importantly, participants found the message more relevant in two of the conditions where a cue effect was predicted (e.g., no distraction/inaction and distraction/action). According to the ELM, individuals are motivated to engage in systematic message processing, and rely on heuristic cues less, when a message is personally relevant to them. Therefore, the heightened relevance in these conditions could explain why no cue effect was found, contrary to initial hypotheses. This finding on the relevance measure was unexpected and is difficult to interpret. Nonetheless, elevated relevance provides a possible reason for why a cue effect was not revealed in conditions where it was predicted.

Ceiling Effects

Ceiling effects may have also prevented this experiment from yielding the predicted results. Indicative of ceiling effects are the large means across conditions. In fact, on a nine-point scale the means in all conditions were between seven and eight. The most likely cause of these ceiling effects is the very positive nature of the message. The message contained strong arguments which were designed to induce the formation of favorable attitudes toward the message topic. Thus, participants who had never before been exposed to information on the fictitious grain product, read a passage extolling its virtues. Given that the only information participants had regarding the grain product

came from a one-sided and highly supportive informational passage, they may have had little basis for countering the message on any level and simply acquiesced. In other words, participants may have had little reason for opposing the message, rendering the manipulations ineffective in eliciting differences across conditions.

Another possible contributor to the apparent ceiling effects is the relevance of the message. The average score on the relevance measure in the current experiment was significantly greater than the mid-point of the scale. Interestingly, Handley and Albarracin (2010), in Experiment 1, used the identical message and still obtained significant differences in attitudes between action- and inaction-primed participants. However, in that experiment the position of the message was manipulated. In other words, some participants read a message advocating the grain product (the same message used in this experiment) whereas other participants read a message impugning the grain product. An analysis of the relevance measure showed that participants found the pro-topic-message more relevant than the anti-topic-message. Correspondingly, results indicated that although action (versus inaction) participants more effortfully processed the messages overall, all participants appeared to process the pro-message more than the anti-message. That is, there was more variability in the anti-message-topic conditions. Therefore, relevance may have increased effortful processing in the current experiment given that only the pro-topic-message was employed, providing another possible explanation for the apparent ceiling effects obtained in this experiment.

Understanding the Obtained Effects

So far, results on the supplementary measures (i.e., processing, relevance, etc.) have been used to explain why the predicted effects were not obtained in the current experiment. However, the results of these measures themselves are interesting in what they suggest regarding the effects of action and inaction goals on cognitive processing.

For example, action (versus inaction) participants were more likely to accurately recall the distracter item, which suggests that they were able to more effectively mobilize cognitive resources to both rehearse the eight-digit number and process the message simultaneously. This increase in cognitive activity corroborates previous research (Albarracin et al., 2008; Albarracin & Handley, 2009; Handley & Albarracin, 2010). In addition, the marginally significant interaction on the processing measure indicates that action participants reported processing the message less than inaction participants in the no-distraction conditions. Although speculative, it is possible that these two results complement one another. That is, the activation of greater cognitive resources triggered by an action goal might allow individuals to process information with greater perceived ease. Conversely, the relatively less activation of cognitive resources triggered by an inaction goal might induce individuals to process information with greater perceived effort. Moreover, results on the processing measure could have influenced responses on the relevance measure in that perceived processing effort might provide a cue individuals employ to make an inference concerning relevance. Specifically, if individuals perceive themselves processing information to a negligible extent they might infer that the message held little personal relevance. On the other hand, if individuals perceive

themselves processing information to a significant extent, they may infer that the message held considerable personal relevance.

Thus, it remains possible that relevance did not necessarily influence processing effort as previously argued. Rather, action goals could have increased processing resources, and thus made thinking seem less effortful. Further, individuals might have used degree of perceived processing effort as a clue as to how relevant the message was. If this is true, the current finding may, to an extent, corroborate previous research.

Future Directions

In the current experiment, several possible problems have been identified, the correction of which could make this experiment worth re-running in the future. First, there is evidence that the distraction manipulation was differentially effective based on the goal prime, meaning that the independent variables were only independent in name. In retrospect, it is not surprising that action and inaction-primed individuals differentially recalled the distraction number given previous research indicating their effects on cognitive activity (e.g., Albarracín et al., 2008). Therefore, future research could utilize a passive distraction task to again test these hypotheses. Interestingly, a future experiment could employ an active versus passive distraction manipulation to investigate how different types of distractions affect cognitive processing when crossed with action versus inaction goal primes. For example, a passive distracter should not satisfy an action goal, and thus should not be reactive to the goal primes. Therefore, an action goal should be left operating to increase the effortful processing of presented information. On the other

hand, an active distracter should satisfy an action goal, rendering that goal ineffective at increasing cognitive processing of presented information.

Second, the message utilized in this experiment contained strong arguments. In hindsight, the overall message may have been too strong to elicit significant differences across conditions. For example, the ELM predicts that individuals are more likely to rely on peripheral cues (e.g., message source) when they are *either* unmotivated or unable to effortfully process a message. In the current experiment, participants who were both primed with inaction and distracted had both their motivation *and* ability compromised by manipulations. Therefore, according to prior ELM research, distracted inaction-primed participants should have certainly exhibited a cue effect. Yet, these participants formed favorable attitudes towards the topic whether the ostensible message source was an expert or a non-expert. Given that this experiment failed to replicate well-established results in conjunction with the favorable attitudes across conditions, the very positive nature of the message is the likely culprit for these null effects. That is, even when individuals are unmotivated and unable (or at least their ability has been compromised) to process a message, they will still, to an extent, process the message given the demands of the experiment. It is possible that the very positive nature of the message elicited favorable attitudes with only a cursory reading. In the future, an alternative message about the grain product could be constructed by including some weaker arguments. In other words, including a few weaker arguments may offset the apparent ceiling effects obtained in the current experiment by allowing some basis for countering the message.

Along those lines, it may be wise to devise and pre-test an entirely different message for a future experiment given that the overall mean relevance score was significantly greater than the mid-point of the scale. It is possible that the relatively high relevance scores in the current experiment superseded the effects of manipulations such that participants effortfully processed the message despite being distracted or possessing an inaction goal. Therefore, a message that has been pre-tested to elicit neutral relevance scores would help counteract this problem.

Third, it remains uncertain as to why previous research was not replicated in the no-distraction conditions. That is, contrary to the findings of Handley and Albarracín (2010), the current experiment did not find that action-primed (versus inaction-primed) individuals were more affected by the message. A possible explanation is that participants learned of the message source following the prime and prior to the message, satisfying action goals. In other words, presenting source information first may have required the participant to process that information to an extent that satisfied their action goal, rendering the primes ineffective in terms of increasing effortful processing of the message. If this is true, individuals who satisfied an action goal via the processing of source information would have resembled individuals with inaction goals at the time they read the message. In addition, the processing of source information would not have satisfied the goals of inaction-primed individuals leaving those goals in operation at the time they read the message. Thus, presenting the message source after the prime manipulation may have resulted in all participants having an inaction goal at the time of message processing, resulting in similar results regardless of the primed goal. With that

in mind, future research could present the message source before the manipulation of action and inaction goals to avoid the satisfaction of goals prior to message processing.

Alternatively, a future experiment could employ a different peripheral cue altogether. It is possible that the cue used in the current experiment (i.e., message source) required enough cognitive processing to satisfy an action goal given participants would have had to make an inference about the credibility of the message source in order to effectively use the cue. Thus, making such an inference involved cognitive activity that may have satisfied the action goal. To circumvent this possible problem, future research could utilize a less cognitively demanding peripheral cue. For example, manipulating the attractiveness rather than the credibility of the source might provide a more tangential cue making it less likely that the cue could satisfy a goal-prime.

The Satisfaction of Action Goals

The possible satisfaction of action goals prior to message processing necessitates consideration of what types of activities will and will not satisfy these goals. For example, perhaps exceedingly trivial behaviors (e.g., scratching one's head) could satisfy action goals. This seems unlikely, however, in that the satisfaction of an action goal is likely to require one's focal attention. That is, scratching one's head is an activity tangential to the requirements of the experiment. In the current experiment, however, processing information such as the distracter item and message source information were relevant to the experiment and within participants' scope of attention. Therefore, these tasks were likely influenced by the goal prime. Nonetheless, future research could be

directed toward an examination of the various activities which could and could not satisfy general action and inaction goals.

Action and Inaction Goals in Explaining Previous Research

The question remains as to how well action and inaction goals explain previous research. That is, previous research demonstrating effects of specific goals on behavior could perhaps be explained by action and inaction goals. For example, Bargh, Chen, and Burrows (1996) found that participants primed with words associated with the concept of rudeness (e.g., intrude, disturb, interrupt) were quicker to interrupt a conversation between two other people versus participants primed with words associated with the concept of politeness (e.g., patiently, yield, cautiously). Presumably, activation of a trait construct resulted in trait-consistent behavior. However, it is possible that the “rude” words in this experiment, given they are related to action, could have triggered an action goal whereas the “polite” words, given they are related to inaction, could have triggered an inaction goal. Therefore, the observed trait-consistent behavior may have instead been the result of the primes respectively triggering action and inaction goals, which necessitates a re-examination of previous research for this alternate possibility.

Although the inadvertent priming of action and inaction goals might explain some prior research, it is not likely to explain it all. For example, Chartrand and Bargh (1996) found that participants primed with an impression formation goal recalled more behavioral descriptions of a target person relative to participants primed with a memorization goal. Presumably, superior recall is the result of impression formation

goals encouraging the use of meaningful trait constructs. Importantly, both impression formation and memorization are cognitive activities falling beneath the umbrella of general action. However, given they elicit different amounts of cognitive activity, it seems likely that the effects of these goals are not merely due to the triggering of action. Rather, these goals might possess specific properties making them distinct from one another and more specific than action goals.

CONCLUSIONS

This experiment attempted to reconcile seemingly disparate findings in the general action and inaction goal literature. Previous research indicates that action (versus inaction) goals sometimes facilitate more and sometimes less effortful cognitive activity. The current research hypothesized that these apparent inconsistencies can perhaps be explained by positing default-enhancing properties of action-goals. That is, action goals may accentuate the default cognitive activity of a given situation. Although this experiment failed to support this general hypothesis, several possible explanations for the null results were identified. Addressing these experimental issues in future research will hopefully shed more light on the effect of action and inaction goals on cognitive heuristics.

REFERENCES CITED

- Ajzen, I. & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracin, B. T. Johnson, & M.P. Zanna (Eds.), *The handbook of attitudes* (pp. 173-221). Mahwah, NJ: Erlbaum.
- Albarracin, D. & Handley, I. M. (2009). *The time for doing is not the time for change: Effects of general action and inaction goals on attitude accessibility and attitude change*. Manuscript submitted for publication.
- Albarracin, D., Handley, I. M., Noguchi, K., McCulloch, K. C., Li, H., Leeper, J., Brown, R.D., Earl, A., & Hart, W. (2008). Increasing and decreasing motor and cognitive output: A model of general action and inaction goals. *Journal of Personality and Social Psychology*, *95*, 510-523.
- Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct Effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology*, *71*, 230-244.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, *42*, 116-131.
- Chartrand, T. L., & Bargh, J. A. (1996). Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions. *Journal of Personality and Social Psychology*, *71*, 464-478.
- Cohen, J. B., & Reed, A. (2006). A multiple pathway anchoring and adjustment (MPAA) model of attitude generation and recruitment. *Journal of Consumer Research*, *33*, 1-15.
- De Dreu, C., K., W. (2003). Time pressure and closing of the mind in negotiation. *Organizational Behavior and Human Decision Processes*, *91*, 280-295.
- Dijker, A. J., & Koomen, W. (1996). Stereotyping and attitudinal effects under time pressure. *European Journal of Social Psychology*, *26*, 61-74.
- Fazio, R. H., Ledbetter, J. E., & Towles-Schwen, T. (2000). On the costs of accessible attitudes: Detecting that the attitude object has changed. *Journal of Personality and Social Psychology*, *78*, 197-210.
- Gilbert, D. T., & Hixon, J. G. (1991). The trouble of thinking: Activation and application of stereotypic beliefs. *Journal of Personality and Social Psychology*, *60*, 509-517.

- Gilbert, D. T., Pelham, B. W., & Krull, D. S. (1988). On cognitive busyness: When person perceivers meet persons perceived. *Journal of Personality and Social Psychology, 54*, 733-740.
- Glasman, L. R., & Albarracin, D. (2006). Forming attitudes that predict future behavior: A meta-analysis of the attitude-behavior relation. *Psychological Bulletin, 132*, 778-822.
- Handley, I. M. & Albarracin, D. (2010). *The attitude-action linkage: Effects of action and inaction goals on the influence of novel external information*. Unpublished manuscript.
- Jarvis, B. (2004). Media lab software. *Empirisoft Corporation*.
- Kiesler, S. B., & Mathog, R. B. (1968). Distraction hypothesis in attitude change: Effects of effectiveness. *Psychological Reports, 23*, 1123-1133.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology, 19*, 123-205.
- Petty, R. E., & Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality and Social Psychology, 41*, 847-55.
- Priester, J. R., Nayakankuppam, D., Fleming, M., Godek, J. (2004). The A²SC² model: The influence of attitudes and attitude strength on consideration and choice. *Journal of Consumer Research, 30*, 574-587.
- Schwarz, N., & Bohner, G. (2001). The construction of attitudes. In A. Tesser & N. Schwarz (Eds.), *Blackwell handbook of social psychology: Intraindividual processes (Vol. 1)*. Oxford, UK: Blackwell.
- Shah, A. K., & Oppenheimer, D. M. (2008). Heuristics made easy: An effort-reduction framework. *Psychological Bulletin, 134*, 207-222.
- Simon, H. A. (1990). Invariants of human behavior. *Annual Review of Psychology, 41*, 1-19.
- Tversky, A., & Kahneman, D. (1974). Judgment under certainty: Heuristics and biases. *Science, 185*, 1124-1131.

APPENDIX A

“MINIAC” MESSAGE

An ancient grainlike product that has recently been "rediscovered" in this country could well be the antidote to many of our diet-related illnesses. Called miniac, it has a light, delicate taste, and can be substituted for almost any other grain. Though miniac is a recent addition to the North American larder, this crop, native to the Amazon basin, sustained the ancient Yoru tribe. Miniac thrives in wet, rainforest conditions, although new strains are being cultivated for growth and large-scale distribution in the United States.

Nutritionally, miniac might be considered a supergrain--although it is not really a grain, but the seed of a leafy plant that's distantly related to spinach. Miniac has excellent reserves of protein and, unlike other grains, is not missing the amino acid lysine, so the protein is more complete. The World Health Organization has rated the quality of protein in miniac at least equivalent to that in fish. Miniac offers more iron than other grains and contains high levels of potassium and riboflavin, as well as other B vitamins: B6, niacin, and thiamin. It is also a good source of magnesium, zinc, copper, manganese and folate (folic acid).

Although no single food can supply all of life's essential nutrients, miniac comes close. It is extraordinarily rich in nutrients, containing up to 75% more protein than most other grains. One of the best sources of vegetable protein in the vegetable kingdom, miniac has a subtle, smoky flavor. It is a vegetarian source of calcium (40 mg per 1 cup serving), iron (10 mg per serving), and the B vitamins. Miniac also contains high levels of lysine, an amino acid the body needs to make protein.

Not only does such high nutritional quality make this an excellent subsistence food for famine-stricken populations, miniac could also provide the answer to the deficiencies of a modern diet which has resulted in an epidemic of obesity among U.S. citizens. The grain's high protein and nutritional content make it a much healthier food choice than white rice or flour – particularly the refined versions from which most of the nutritional value has been stripped. Miniac is easily ground into a lightweight flour which can be used in pastas and baked goods and still has all the nutritional value of the whole grain.

Nutritionist Ian Milton says that it is these qualities that make miniac so extraordinary: "The concerns that people have these days with consuming too many carbohydrates really disappear when they replace all that super-refined flour and rice with whole grains that still contain all their nutrients, fiber and protein. The trouble is, whole wheat pasta isn't very appealing – it's too tough and heavy. The same goes for brown rice: despite the fact that it's so nutritionally advantageous, no one really wants to eat sushi made with it". Milton points out that pasta made from whole miniac flour is light and tender like the pasta we're most familiar with: "The exception is that this is one large bowl of spaghetti no one needs to feel guilty about eating", he says, "this is really the healthy alternative to those protein-only fad diets that are so popular right now".