WEIGHTING OF POSITIVE VERSUS NEGATIVE AS AN INITIAL DEFAULT RESPONSE

THESIS

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ABSTRACT

Across psychology there exist innumerable examples of default biases that individuals tend to use when making judgments within specific domains (e.g., the correspondence bias, connectedness goals, stereotypes, etc). By their very nature, these default biases rely on relatively domain-specific knowledge that may not carry over into other domains. Due to its fundamental, low-level nature, evaluation of situations or stimuli as either positive or negative represents a facet of judgment that is pervasive across nearly all domains. Two experiments test the idea that the relative weight individuals give to positives versus negatives – their weighting bias – is an initial default bias that is related to the final judgments and decisions individuals make. In Study 1, participants who had little opportunity to override this default response showed greater correspondence between their weighting bias and their exploration of a novel environment. Study 2 demonstrated that when motivated to mistrust their default response, participants showed no correspondence between their weighting bias and their risk-taking behavior, but strong correspondence when they were motivated to trust their default response. It is argued that in the absence of relevant substantive knowledge, individuals do not act randomly across domains, but instead rely on their fundamental weighting of positives and negatives to navigate these ambiguous situations.
Dedicated to my family: Mike, Lois, and Josh Rocklage
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CHAPTER 1: INTRODUCTION

Psychology is replete with research on default biases. These biases span the spectrum of psychology all the way from impression formation to relationships to stereotyping and prejudice. Each of these domains represents a facet of psychology where understanding individuals’ initial default tendencies has led to a wealth of knowledge about how individuals think, make judgments, and ultimately navigate their environments.

Research within these domains has also made it apparent that default biases can be overcome when individuals have the motivation and opportunity to do so. Hence, default tendencies are often discussed within the context of dual-process models. Indeed, the search for how and when default biases contribute to judgments and behavior has led researchers to propose a number of dual-process models. Though there are many different flavors, these models all have similar features. They all postulate a more spontaneous processing method that is often referred to as more automatic, intuitive, top-down, or “quick-and-dirty” (see Chaiken & Trope, 1999). This type of processing is often characterized by individuals utilizing their preconceptions in order to understand novel information. This way of processing represents a more automatic and less “effortful” method of processing the environment. These models also postulate a second, more deliberative processing method, which has also been termed as more thoughtful, effortful, or bottom-up. This type of processing attempts to systematically build judgments and decisions and relies less on preconceptions and biases (see Moskowitz, Skurnik, &
Galinskey, 1999). The deliberative processing method is considered slower and requires more effort and greater cognitive resources to utilize. These models also specify what conditions encourage this more deliberative processing and what conditions encourage the more spontaneous processing. Due to the additional energy, time, and general resources required by the more deliberative processing style, individuals may be less willing to use this processing style when it is not required. Thus a successful dual-process model will be required to explicate when each style of processing is more likely to be utilized.

Just as one example of default tendencies, consider what is known about dispositional inference processes. Researchers have suggested that it is an initial, default bias or response for individuals to attribute actors’ actions to their internal disposition rather than any cause of things external to them (Ross, 1977; Gilbert & Malone, 1995). In fact, it is thought to be so pervasive that some researchers have termed this bias the fundamental attribution error, but it is also known as the correspondence bias (Gilbert & Malone, 1995). The classic experiment demonstrating this bias is the Jones and Harris (1967) study in which perceivers drew inferences about the positive or negative attitudes of a speaker even when they were told that the speaker was not given a choice about which side of the argument to advocate.

Subsequent research goes further and characterizes this bias as a potential default that individuals use when initially understanding another’s behavior (Gilbert, Pelham, & Krull, 1988; Gilbert & Malone, 1995; Trope, 1986; Trope & Alfieri, 1997). For example, in one study demonstrating this, participants who were simultaneously asked to form impressions of a woman as anxious or not as well as rehearse additional information were
less likely to account for plausible aspects of the situation that could have made her anxious (Gilbert, Pelham, & Krull, 1988). Participants not required to rehearse the additional information showed less reliance on this bias. Due to the added cognitive load of the rehearsal task, these participants seemed unable to override their initial default response of attributing the woman’s anxious behavior to her internal disposition rather than to the situation.

Two dual-process models in particular have been put forth to account for correspondence bias results like those outlined above (Gilbert, Pelham, & Krull, 1988; Trope, 1986). Both models posit an initial stage during which perceivers identify a behavior, categorize it, and then infer whether an individual can be characterized by the trait category that was identified. For Gilbert et al. (1988), this represents both the categorizing and characterization stages while this is the initial identification stage in Trope’s (1986) model. In both conceptions, this initial set of processes is thought to be relatively more automatic and resource-independent – a more spontaneous mode of processing. This first set of processes may then be followed by a more effortful, resource-dependent stage of “correction” or “inference” where individuals can adjust for the influence of the situation – a more deliberative mode of processing. The increased effort required during this stage, however, may lead it to be passed over given certain situational constraints – as was the case when participants had the extra task of rehearsing additional information.

Research in the domain of close relationships has similarly benefited from a consideration of default biases and dual processes. After a threat to a close relationship, individuals’ default response is to actually increase connectedness with those with whom
their relationship was threatened (Murray, Derrick, Leder, & Holmes, 2008; Murray & Holmes, 2009). In one experiment, the researchers showed that after recalling a threat to their relationship, high self-esteem, but not low self-esteem, participants indicated a greater willingness to connect with their relationship partner (Murray et al., 2008, Experiment 2). When given a cognitive load, however, this difference disappeared: both low and high self-esteem participants indicated a greater willingness to connect with their relationship partner (Experiment 6). The researchers posit that such a finding reflects the inherent need for closeness as well as the implicit theory that approaching the other person in our relationship should decrease our anxiety (Baumeister & Leary, 1995). It appears that low self-esteem participants effortfully counter this default response due to the motivation to protect themselves from future rejection from their partner.

Another example of a default bias found in psychology is that of stereotyping. Though any number of studies could be referenced in this regard, one paradigm in particular shows the devastating potential of relying on a default bias: the shooter bias (Correll, Park, Judd, & Wittenbrink, 2002). The shooter bias paradigm itself is based on the accidental shooting of an unarmed 22-year-old African immigrant by police officers. While searching for a rape suspect in a Bronx neighborhood in New York, police saw Amadou Diallo who police claimed resembled the suspect they were looking for. Though officers ordered him not to move, Diallo reached into his pants pocket. Police officers thought he was reaching for a weapon and shot him 19 times and thereby killing him. In order to model this real-life situation, the shooter bias paradigm requires participants to decide whether a pictured individual is holding a gun and should be shot or holding something other than a gun and should not be shot. The individuals pictured in the game
were either African American or White males. Results of the studies using this paradigm have shown that regardless of whether or not the target was holding a gun, participants were quicker and more likely to shoot a target when that target was African American (Correll, Park, Judd, & Wittenbrink, 2002, Experiments 1 and 2).

As in the domains of dispositional inferences and relationships, investigators have put forth a dual-process model to account for when this shooter bias should be most likely to influence judgments and behavior (Payne, 2001; Payne, 2006). In particular, it has been proposed that a stereotypic association between African American males and violence is activated upon perceiving an African American male and that this association will automatically drive responses unless individuals control this automatic response (Payne, 2006). In other words, seeing an African American readies the behavioral response to “shoot” because of held theories, cultural or otherwise, of what traits are related to African American males. Individuals must then have the time and motivation to control this default response if they do not wish to be influenced by it. In support of this idea, experiments have shown that individuals make very few mistakes of shooting an innocent African American male when given unlimited time, but are much more likely to mistakenly shoot an innocent African American male when time is constrained (Correll et al., 2002; Payne, 2001).

**Attitudes and default responses: The MODE model**

Like stereotypes, attitudes can also provide an initial default response (Fazio, Sanbonmatsu, Powell, & Kardes, 1986). Due to their automatic activation from memory upon encountering an attitude object, attitudes have the ability to influence construals of a situation, which can ultimately alter subsequent behavior. Consistent with this
proposition are findings that accessible attitudes can automatically orient attention (Roskos-Ewoldsen & Fazio, 1992), influence categorization of an attitude object (Smith, Fazio, & Cejka, 1996), and influence the perception of that object (Fazio, Ledbetter, & Towles-Schwen, 2000).

One model of predicting when an automatically activated attitude will influence behavior is the Motivation and Opportunity as Determinants (MODE) model (Fazio, 1990; Olson & Fazio, 2009; Fazio & Towles-Schwen, 1999). As a dual-process model, the MODE model shares the similarities of these models as enumerated in the opening paragraphs of this paper. Indeed, it proposes the existence of two different processing styles and labels them as more spontaneous or more deliberative.

In the MODE model, behavior can be guided by attitudes in a more spontaneous fashion where individuals do not actively consider their attitude. In this mode of processing, then, it is postulated that attitudes may be automatically activated upon presentation of an attitude object and that these automatically activated attitudes can lead to behavior by affecting construals of the object in the immediate situation (Fazio, 1990).

The more deliberative processing style has also been used to predict when an attitude may lead to behavior. For example, a great deal of research has proposed that it is sometimes the case that deliberating on the positives and negatives of a particular behavior, and thus using attitudes to judge the behavior, is one way in which individuals often make decisions (Ajzen, 1991; Ajzen & Fishbein, 1980). As mentioned above, the use of this more deliberative processing style involves a great deal of energy and time. Due to this increased effort, individuals may not utilize this style of processing unless certain circumstances are present.
The MODE model proposes that these two processing styles can be mixed; in other words, a given judgment or decision can involve both the more spontaneous and deliberative processing styles. Upon the presentation of a stimulus, it is hypothesized that the more spontaneous processing style may become initially activated and lead to behavior unless the more deliberative processing style interferes and changes this initial response (Olson & Fazio, 2009). Whether or not this more deliberative style is enacted depends on the **motivation** and **opportunity** a person has in that situation. Thus, while individuals may have a certain automatically activated attitude that carries over to behavior, this relationship can be modified if they are both motivated to change this response and also have the opportunity to do so (e.g., enough time, cognitive resources, or general ability).

On the motivational side, studies concerning racial attitudes have found that the more motivated individuals were to control prejudiced reactions, the less correspondence there was between individuals’ automatically activated attitudes and verbal behavior regarding self-reported prejudice toward African Americans (Dunton & Fazio, 1997). That is, individuals who were unconcerned with appearing prejudiced showed a positive relationship between their explicit reports of prejudice and an index of their automatically activated attitudes toward African Americans. Those individuals concerned with appearing prejudiced showed nearly the opposite pattern: the more negative the index of their automatically activated attitudes, the more positive their explicit report. As demonstrated in this study, then, motivated individuals were able to correct – and perhaps even overcorrect – for an initial default attitude they had and this led to a greater discrepancy between explicit and implicit measures of the attitude.
On the opportunity side, researchers found that roommate relationships between White and African American students in college dorm rooms dissolved at higher rates than those involving two White students (Towles-Schwen & Fazio, 2006). These dissolutions were predicted by Whites’ automatically activated negative attitudes toward African Americans, but not their explicitly measured attitudes. As the researchers argue, despite the motivation a participant had, prolonged interracial interactions make it difficult to constantly monitor one’s behavior for potential signs of prejudice and this restricts the opportunity participants may have had to effectively control their automatically activated attitudes.

Researchers have also directly manipulated opportunity. In one such experiment, individuals’ attitudes toward candy were implicitly measured and then these individuals were either depleted of self-regulatory resources or not (Hofmann, Rauch, & Gawronski, 2007). Those who were depleted showed correspondence between their implicitly measured attitudes and how much candy they ate subsequently; the more positive their attitudes, the more candy participants ate. Those who were not depleted did not show this pattern, but instead showed correspondence between their current dieting standards and how much candy they ate; the more restrictive their diet, the less candy they ate. These researchers argue that by depleting them of self-regulatory resources, participants no longer had the opportunity to override their automatically activated attitudes toward candy. When not depleted, however, participants were able to override their initial evaluation of candy and eat more in line with their current dieting status.

In each of these cases, then, the MODE model helps to inform when these default responses should and should not lead to a behavior or judgment. Throughout these above
studies, only when participants simultaneously had the motivation and opportunity to override their initial default response did they do so successfully.

**Beyond domain-specific default responses**

In the examples given of default responses thus far, however, all have relied on the implicit assumption that a default response, in fact, exists. Indeed, the identification of the default within each separate domain was pivotal to understanding when individuals would and would not behave in a particular fashion. For instance, the observer bases an attribution on internal dispositions because that is the theory held by most people: when someone behaves in a certain way, it is probably because that person is that way. The relationship partner wishes to approach a significant other when threatened because the partner theorizes the significant other will be accepting and comforting. The shooter utilizes cultural knowledge or stereotypes in order to make a quick decision in a situation that could mean life or death for the shooter. The individual uses his/her attitude toward African Americans to behave in a way that individual deems appropriate.

There are many situations, however, when individuals are unable to rely on domain-specific knowledge or theories. For instance, individuals may not have any experience in a given domain and it may be completely novel to them. It is also possible that they simply have yet to develop any substantive associations or theories within the domain. Finally, individuals can also be faced with the situation where the existing theories they do have do not lead to a clear judgment one way or another. What do people do in these situations? How do they navigate these situations until they have developed attitudes, stereotypes, or a theory? Do they act randomly or is there an underlying process people rely on to disambiguate these situations and make a decision?
According to the MODE model, these situations will lead individuals to have no choice but to construct an attitude, stereotype, or theory on the spot. This construction necessitates at least a cursory consideration of the alternatives at hand in order to come to a single decision. To answer the above questions, then, identifying the alternatives that are considered as a starting point for decision making would be important in understanding the systematic nature of this process when lacking substantive knowledge. Indeed, by clarifying how such a construction process may begin and what information might be most useful for it, a better understanding of the process as a whole may be obtained. After this initial starting point, further motivation and opportunity may then lead individuals to scrutinize and refine this initial judgment.

One candidate for a starting point for this process is a quick distillation of relevant positive and negative features which can then be followed by the weighting of these valences against one another to arrive at an initial response. Indeed, across a number of different domains it appears that the extent to which individuals attend to, remember, and utilize positive versus negative information is important in judgment and decision making.

In general, past research has put forward the possibility that there is overall more weight given to negatives as opposed to positives (e.g., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). Other researchers have echoed this sentiment and argued that a single-unit increase of negativity has greater implications for subsequent behavior compared to a single-unit increase of positivity (Cacioppo, Gardner, & Bernstein, 1997). Beyond this general asymmetry, researchers have found that individual differences in the extent to which attention is given to negative versus positive stimuli predicts emotional
reactivity to a stressful situation (Macleod, Rutherford, Campbell, Ebsworthy & Holker, 2002).

Research on the nature of positives and negatives has also indicated that the relative weight given to these valences may differ from individual to individual and that this individual difference in weighting of positive and negative affects judgments across a number of different domains. A recently introduced behavioral paradigm, BeanFest, allows for researchers to obtain a pure measure of the extent to which individuals weight positives relative to negatives (Pietri, Fazio, & Shook, 2011; Shook, Fazio, & Eiser, 2007; Fazio, Eiser, & Shook, 2004). Based on how participants categorize novel stimuli, beans in this case, that resemble both positive and negative beans they had learned just earlier, researchers are able to measure the extent to which a given individual tends to weigh these resemblances to positives and negatives. For example, if given a novel bean that has strong resemblances to both a positive and negative bean previously learned, a person who, on average, categorizes that novel bean as negative is displaying a more negative weighting bias.

Utilizing this behavioral measure of people’s weighting bias – or the extent to which individuals weight positives versus negatives – Pietri, Fazio, and Shook (2011) found that an individual’s weighting bias was related to judgments in a wide variety of domains, including interpersonal relationships, emotional reactivity to a stressful event, and risk propensity. Specifically, a more negative weighting bias (i.e., giving more weight to negative features than positive features) was related to greater rejection sensitivity, greater emotional reactivity to a stressful event, and less propensity to take risks. Thus it appears that the evaluation of positive versus negative may be fundamental
in the sense that as an individual difference it can carry across a number of different domains and have downstream consequences.

**Current research**

Given that the assessment of stimuli as positive or negative appears to occur across a number of domains, the current research attempts to show that the weight given to these valences can also be an initial default response used to navigate a range of ambiguous situations. Thus, when they have very little substantive knowledge or theory within a domain, the extent to which individuals weight positives and negatives will influence the decision process.

As outlined above, the MODE model provides a useful framework to predict when such a default response would be used if it does, in fact, exist as a default. In the following studies, then, both the motivation and opportunity to override the weighting bias as a default response were manipulated. It was hypothesized that given little opportunity to override their weighting bias, participants would utilize this default response to a greater extent, i.e., behavior would be more strongly related to the weighting bias estimates (Study 1). Furthermore, when motivated to override their weighting bias, individuals would also be less likely to rely on it for decision making (Study 2).
CHAPTER 2: RESTRICTING THE OPPORTUNITY TO OVERRIDE THE DEFAULT WEIGHTING BIAS RESPONSE

Utilizing the tenets of the MODE model, we made predictions of when the weighting bias would and would not be relied upon if it is, in fact, an initial default response. In this first study, we hypothesized that if the weighting bias is used as an initial default response, then participants should rely on this response to a greater extent when they have little time to do otherwise. To that end, the following study restricted the time participants had to make decisions so as to test whether such reduced opportunity to deliberate would increase the correspondence between their weighting bias and the judgments.

METHOD

Overview

Upon entering the lab, participants played BeanFest, a game which measured their weighting bias on a continuum from relatively positive to negative (Fazio, Eiser, & Shook, 2004; Pietri, Fazio, & Shook, 2011). Participants then played a game similar to BeanFest called DonutFest that involved weighing the relative positive outcome of gaining information about the novel DonutFest environment against the relative negative outcome of potentially losing points in the game. Thus, approaching novel stimuli in this paradigm is a risk with potential benefits, but also potential drawbacks. All participants played the same version of BeanFest, but when continuing on to DonutFest half of the participants had 5000 ms to make a decision of whether to approach or avoid the novel
stimuli (unrestricted time condition) while the other half had only 1000 ms to decide (restricted time condition). Participants then filled out the Rational-Experiential Inventory (REI; Pacini & Epstein, 1999), which measures participants self-reported ability and use of a more rational way of thinking and making decisions as well as a more intuitive, automatic, or experiential way of thinking and making decisions.

Participants

Participants were 63 (28 male and 35 female) introductory psychology students who completed the experiment for class credit. Two participants were excluded for an extreme number of missed trials (greater than 2 standard deviations above the mean) in the DonutFest paradigm (in other words, a failure to meet the task requirement of responding within the time deadline). Another participant was excluded for an extreme number of approaches (greater than 3 standard deviations above the mean). A total of 60 participants remained for subsequent analyses (27 male and 33 female).

Procedure

BeanFest. Participants began the experiment by reading instructions related to the BeanFest game. They then had six practice trials where they could become comfortable with the buttons that would be used throughout the game. During this practice phase, participants were shown one bean from each region of the BeanFest matrix (see Figure 1) and told to press “yes” on each trial so that they could become familiarized with the points system and feedback displays.

After this practice phase, participants continued on to the first of three game blocks. During each game block, participants were shown 36 beans (see Figure 1). The same 36 beans were shown in random order in each game-phase block and each retained
its original value across these blocks. It was the goal of the participant, then, to learn which beans were positive (+10 points) and approach them and learn which beans were negative (-10 points) and avoid them in order to maximize their points. Thus, participants were told they must either choose to approach and select the bean by pressing ‘d’ on the keyboard, or avoid the bean by pressing ‘k.’ When selecting a positive bean, participants were told the value of the bean, earned 10 points, and were shown an increase in overall points on their feedback meter in the lower left-hand side of the screen. Conversely, selecting a negative bean would decrease participants’ points by 10. If participants decided to avoid the bean, they would not gain or lose any points, but would still be told the value of the bean. In other words, learning a bean’s value was not contingent on approaching the bean; participants received information about the beans at all times.1

As referred to earlier, participants had an overall point value that changed with each approach decision they made. This overall point value was shown in the bottom left of the screen as a feedback meter and started the participants with 50 points. The overall total points a participant could have ranged from 0 points – participants were notified they have lost the game if this occurs – to 100 points – participants were notified they have won the game if this occurs. After winning or losing a game, participants’ overall point totals were reset to 50. The beans did not change value after participants won or lost and all participants still saw the same 36 beans three times regardless of how many times they won or lost.

Participants then continued on to the test phase of BeanFest where they were shown all 100 beans in the matrix. Thus, there were the 36 beans which they had shown.

1 BeanFest is sometimes implemented with feedback contingent on approach behavior. Given our present interest in the weighting bias, however, we utilized the full-feedback approach as it tends not to produce overall mean differences in the learning of positive vs. negative beans (see Fazio, Eiser, & Shook, 2004).
three times throughout the game phase, but now there were also 64 novel beans that varied in resemblance to these previously-seen positive and negative beans (blank cells in Figure 1). Participants were instructed to categorize the beans as either helpful (press ‘d’ on the keyboard) or harmful (press ‘k’) and received no feedback on the correctness of their decisions.

**DonutFest.** After completing the test phase of BeanFest, participants were told they would be starting a new game involving novel stimuli that resembled donuts. These novel stimuli varied from how yellow to orange to red they were in color, and how large the hole in the middle of the stimulus was (small to medium to large). There were again six practice trials followed by three game-phase blocks and then a test phase.

The parameters for DonutFest were the same as in BeanFest except that instead of 36 stimuli presented in each game phase, there were now 40. More importantly, in DonutFest participants would not learn about a donut’s value unless they chose to approach it. In other words, learning about the donut was contingent on approach behavior. Thus, participants were required to weigh the relative positive outcome of approaching the donut and learning its value against the relative negative outcome of approaching the donut and potentially losing points. Whichever outcome one weighs as the more important outcome will lead to a decision favoring that more heavily weighted outcome. It was participants’ task to decide whether they wanted to approach or avoid the novel donut stimuli.

Participants were placed in one of two conditions for DonutFest. Half of the participants were given a full 5000 ms to make a decision during the game phase
(unrestricted condition) while the other of half of the participants were given only 1000 ms to respond (restricted condition).

**REI.** After DonutFest, participants filled out the REI questionnaire (Pacini & Epstein, 1999). The REI consists of two major subscales. The first subscale, termed the Rationality scale ($\alpha = .86$), consists of items assessing the extent to which participants are able to and actually do engage in a more rational way of thinking and making decisions (“I have a logical mind,” “I prefer complex problems to simple problems”). The second, termed the Experiential scale ($\alpha = .89$), consists of items assessing the extent to which participants are able to and actually do engage in a more automatic, intuitive way of thinking and making decisions (“I can usually feel when a person is right or wrong, even if I can’t explain how I know,” “I often go by my instincts when deciding on a course of action”).

**RESULTS**

**Manipulation check.** If they were relying more on a default bias to make decisions in the restricted time condition, then participants in this condition would have experienced a prolonged episode of intuitive thinking. This recent and salient experience should lead them to indicate that they utilize intuitive thinking and decision making to a greater extent than those in the unrestricted condition when filling out the REI. Those in the restricted condition ($M = 3.48$) did indeed indicate higher scores on the Experiential subscale compared to those in the unrestricted condition ($M = 3.23$), $t(58) = 1.80$, $p = .08$. In their article, Pacini and Epstein (1999) also broke down each subscale into those items that asked the extent to which participants are able to use intuitive thinking versus those which concern whether they actually do use intuitive thinking. Given this further
breakdown, the picture becomes clearer: there is a significant difference between the restricted ($M = 3.55$) and unrestricted conditions ($M = 3.17$) only for the use of intuitive thinking, $t(58) = 2.62$, $p < .05$, and not their general ability to use intuitive thinking, $t(58) = .77$, $p = .45$. These results indicate that restricting their response window increased participants’ self-perceived use of a more intuitive way of responding while not necessarily affecting how good they believe they usually are with this style of thinking.

There were no significant differences between conditions on the overall Rationality subscale, the ability to use rational thinking, or the extent to which participants actually reported using rational thinking (all $t$s < 1).

*Calculating the weighting bias.* The calculation of the weighting bias was focused around participants’ response to the novel beans during the test phase of BeanFest. In particular, the weighting bias considers the extent to which participants classify the novel beans, which resemble both positive and negative beans they had seen previously, as positive or negative *over and above* how well they learned the game-phase beans. To this end, a regression equation was used to predict participants’ average response to the novel beans based on the proportion of positive and negative beans they got correct during the test phase. By predicting participants’ response to novel beans based on their past learning, the *residual* of this regression equation can be used as a measure of their relative weighting bias. Put in other terms, this residual measures the extent to which participants weigh resemblances to a positive and resemblances to a negative *over and above* how well they learned.

Since BeanFest’s inception, multiple studies calculating the weighting bias in BeanFest have been conducted. Due to this, the participants from both this and the other
experiment reported in this paper were able to be aggregated into a much larger, normative sample of 970 participants. This larger sample allowed for a much more accurate measurement of participants’ relative weighting bias within a larger population. The three variables of interest were the proportion of positive game beans correct on the test phase, proportion negative game beans correct on the test phase, and participants’ average response to the 64 novel beans. Responses to a novel bean were coded as +1 if a participant classified it as positive, and -1 if categorized as negative. The average of these responses over the 64 novel beans is thus what is referred to as the participant’s average response to novel beans.

As can be imagined, how well participants learned the positive and negative game phase beans had an effect on how they categorized the novel beans during the test phase. This is important to point out as those novel beans that more closely resemble positives were more likely to be categorized as positive and vice versa for negatives. Indeed, past research has indicated that attitudes toward the game beans generalize to the novel beans that surround them (Fazio, Eiser, & Shook, 2004; Shook, Fazio, & Eiser, 2007). In the aggregate sample used in this paper, the proportion of positive and negative beans correct accounted for 34% of the variance in response to the novel beans, \( F(2, 967) = 246.26, p < .001 \). The multiple regression equation was:

\[
\text{Novel Response} = .55(\text{Positive Correct}) - .77(\text{Negative Correct}) + .07
\]

Both of the regression weights for positive correct, \( t(967) = 13.25, p < .001 \), and negative correct, \( t(967) = 20.43, p < .001 \), were significant. These results indicate two important phenomena: first, the learning of the game beans affected how participants categorized the novel beans. As mentioned above, this result is in line with past research
indicating that learning generalizes to the novel beans (Fazio et al., 2004; Shook et al., 2007). Second, this shows that the evaluations of negative beans generalize to novel beans to a greater extent than the effect of positive beans. Thus, participants who learned both bean-types equally well (e.g., 90% of both positive and negative beans correct) show a greater weighting of negatives over positives (predicted response to novel beans of - .13). As this indicates, individuals show a negativity bias on average.

Importantly, however, there is variability around this average. While participants on average show greater weightings of negatives over positives, the extent to which this occurs is dependent on the individual. When participants responded differently to the novel beans than what one would expect given how well they learned the positive and negative beans, this represents deviation from this general trend. This difference from what one would expect based on learning is thus the residual used as a measure of the weighting bias. Explicitly, a more positive (negative) residual indicates more weight given to positive (negative) resemblances to game phase beans than what one would expect given how well that individual learned. Within the present sample, the residuals ranged from -.44 to .37, with a mean of .02 and a standard deviation of .19.

DonutFest behavior. Although framed as a decision of whether to approach or avoid, participants’ behaviors reflected the fact that they actually had three decision choices in DonutFest: actively avoid the donut, actively approach the donut, or allow time to run out and thereby avoid the donut (as a lack of a response resulted in no gain of information or point change). Each behavior will be looked at in turn.

Given that participants with a more negative weighting bias tend to give more weight to negatives than positives, these participants should have been more likely to
avoid donuts when they had very little time. In other words, participants with a negative weighting bias should have weighed the risk of losing points as more important compared to the information gain that stems from approach behavior. This weighting, in turn, should thus have led to more avoidance behavior. This pattern should be particularly true at the very outset of the DonutFest game as participants have no other past information on which to rely. Most importantly, our conceptual reasoning predicts that the relationship between weighting bias and avoidance behavior should be more apparent in the restricted time condition than in the control condition.

This pattern was indeed confirmed by the results. Participants’ weighting bias was related to avoidance behavior, but only in the restricted time condition. Specifically, the more negative their weighting bias, the more times participants chose to avoid a donut when in the restricted condition (see Figure 2). These results were obtained using a multiple regression equation predicting avoidances in the first block of the game phase from condition (restricted vs. unrestricted), weighting bias, and their interaction. There was a main effect of condition ($B=-3.15, t(56) = 4.52, p < .01$) indicating that participants in the unrestricted condition avoided donuts less than those in the restricted condition. The only other significant effect was the predicted condition by weighting bias interaction ($B=-1.89, t(56) = 2.68, p < .01$). A simple slopes analysis revealed that those with a more negative weighting bias generally avoided more donuts than those with a more positive weighting bias when in the restricted condition ($B=-2.90, t(56) = 2.82, p < .01$), but not the unrestricted condition ($B=.87, t(56) = .96, p = .37$).^{2}

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^{2} Analyzing all of the blocks (1, 2, and 3) combined showed only a main effect of condition ($p < .05$) indicating that those in the restricted condition avoided less than those in the unrestricted condition, with no effects of weighting bias. This is consistent with our view of the weighting bias as being most relevant to situations in which individuals have little a priori evaluative knowledge. By the end of Block 1, participants...
A similar pattern should be seen with approaches to novel donuts: those with a more positive weighting bias should rely on this bias and make more decisions to approach novel donuts. This pattern should be particularly true for those participants with little time to override their default bias. This, however, was not the case.

A multiple regression equation predicting approaches to donuts in the first block of the game phase from condition, weighting bias, and their interaction did not produce the predicted condition by weighting bias interaction ($B=.51$, $t(56) = .78$, $p = .44$). There was only a marginal main effect of condition ($B=-1.01$, $t(56) = 1.70$, $p = .09$) indicating that those in the unrestricted condition tended to approach more than those in the restricted condition.³

As mentioned above, however, there was a third option in the DonutFest game where participants could passively avoid a donut by allowing time to run out on the trial. A time-out is functionally equivalent to actively avoiding the donut – in both cases participants gain no additional information about the donut and points do not change.

Using the same regression predictors as above, the number of missed trials in the first game phase block were predicted. This analysis revealed a main effect of condition ($B=4.24$, $t(56) = 9.05$, $p < .01$), which indicated that those in the restricted condition missed more trials than those in the unrestricted condition. This main effect of missed trials explains why there were main effects in both approaches and avoidances in previous regression analyses: participants in the restricted condition were simply responding less overall. After all, it is they who have the difficult task of reaching final

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³ Again, analyzing all of the blocks combined showed only a main effect of condition ($p = .05$) indicating that those in the restricted condition approached less than those in the unrestricted condition.
decisions and responding within 1000 ms. The regression analysis also revealed a main effect of weighting bias \((B=1.16, t(56) = 2.44, p < .05)\) indicating that those with a positive weighting bias missed more trials. This was qualified by a condition by weighting bias interaction \((B=1.37, t(56) = 2.90, p < .01)\). Simple slopes analysis showed that there was a significant relation between weighting bias and missed trials in the restricted condition \((B=2.53, t(56) = 3.66, p < .01)\), but not the unrestricted condition \((B=-.21, t(56) = .33, p = .74)\). In other words, it appears that those with a more positive weighting bias were missing significantly more trials than those with a more negative weighting bias, but only when time was restricted (see Figure 3).\(^4\) Speculations as to why this may have happened will be offered in the Discussion section.

The pattern obtained with respect to missing responses prompted another examination of the approach-avoidance decisions. Another way to examine the relation between weighting bias and approach-avoidance behavior would be to focus on just those donuts for which participants expressed a decision. In other words, when a decision was actually made, how did participants respond? To examine this question, the proportion of donuts each participant approached was calculated relative to the number of donuts on which the participant had expressed a decision in the allotted time.

Using this metric provided additional support for the hypothesis. We would expect that when a participant with a positive weighting bias made an active decision, it should more likely have been an approach as opposed to an avoidance decision.

Predicting proportion of donuts approached from condition, weighting bias, and their

\(^4\) This pattern of results was also seen when predicting missed trials in all the blocks, though the effect is strongest in the first block. All blocks: main effects of condition \((B=12.25, t(56) = 9.38, p < .01)\) and weighting \((B=3.34, t(56) = 2.51, p < .05)\), and a weighting by condition interaction \((B=3.45, t(56) = 2.60, p < .05)\).
interaction revealed that exact relationship (see Figure 4). There was a main effect of condition ($B=.05$, $t(56) = 2.57$, $p < .05$) indicating that those in the restricted condition were more likely to approach when a decision was made compared to the unrestricted condition. This main effect was qualified, however, by a condition by weighting bias interaction ($B=.04$, $t(56) = 2.14$, $p < .05$). Simple slopes analysis revealed that those with a more positive weighting bias showed a greater proportion of approaches in the restricted condition ($B=.06$, $t(56) = 2.12$, $p < .01$), but not the unrestricted condition ($B=-.02$, $t(56) = .87$, $p = .39$).

Latencies to approaching versus avoiding. We also reasoned that the latencies with which participants in the restricted time condition approached versus avoided donuts may provide additional evidence for the operation of a default weighting bias. Specifically, if the weighting of positive versus negative is a default response, individuals’ response times to approach rather than avoid a donut should be related to their weighting bias when they are forced to rely on this response. Those with a more negative weighting bias should show faster response times when avoiding a donut than when approaching a donut. To this end, a difference score was calculated as the average response time when a participant actively approached a donut subtracted from the average response time it took to avoid a donut. On average, participants appear to be faster to approach rather than avoid ($M = 29.59$ ms, $SD = 87.54$ ms). This difference is nearly significant from 0 ($t(29) = 1.85$, $p = .07$). While individuals on average are faster to approach, there is, however, variability around this average with some individuals making approach decisions more quickly than avoid decisions and vice versa. As predicted, the time they took to make their decisions was related to their weighting bias.
When participants had little time to override their default bias, there was a positive correlation between individuals’ weighting bias and how long it took them to respond to avoid versus approach \((r(30) = .35, p = .06)\). In other words, the more negative their weighting bias, the quicker participants were to avoid compared to approach a novel donut and, conversely, the slower those with a positive weighting bias were to avoid.\(^5\)

**DISCUSSION**

The results from this first experiment provide general support for the idea that the weighting of positives and negatives is a default bias that can be used in decision making. Those participants who had little time to override their default bias indicated greater use of more automatic, intuitive decision making and thinking on the manipulation check items. More importantly, when they had little time, participants displayed greater reliance on their weighting bias while navigating the novel DonutFest environment. This relationship was very apparent for those with a more negative weighting bias as they avoided more novel stimuli compared to those with a more positive weighting bias. This relationship also becomes apparent for those with a more positive weighting bias when looking at those trials where they actually made a decision. When making a decision, those with a positive weighting bias were more likely to approach while those with a negative weighting bias were less likely to approach. Our hypotheses were also reflected in the time it took individuals to make decisions in line with their default bias. The more

\(^5\) Should we have expected a similar pattern in the unrestricted time condition? We think not. Participants could be utilizing a number of different strategies in the unrestricted condition and, most importantly, have ample time to reflect upon and revise any initial judgment. Furthermore, a full 5000 ms to respond results in considerable variability in response times. Indeed, the standard deviation of response times in the unrestricted condition was 261 ms whereas the restricted condition showed a much smaller standard deviation of 78 ms. This marked difference in variance renders comparison of correlation coefficients across the two conditions rather dubious. For the interested reader, the correlation between weighting bias scores and the latency index was smaller in the unrestricted condition, \(r(30) = .00\), than in the restricted condition, \(r(30) = .35\), but not to a statistically significant degree, \(z = -1.28, p = .20\).
negative individuals’ weighting biases were, the faster they were to avoid novel stimuli and vice versa for those with a more positive weighting bias.

It is important to note, however, that participants did not appear to miss trials randomly in the restricted time condition: those with a more positive weighting bias missed more trials than those with a more negative weighting bias. There may be two reasons for this pattern. First, when we refer to participants with a positive weighting bias, we are referring to those participants who are relatively more positive compared to the average person. The average weighting bias, as will be recalled from the above Results section, is negative. Yet, the residual approach that we adopted to index the weighting bias essentially sets this average to zero. Thus, participants with a more positive weighting bias score may have missed more trials because they essentially lack a strong valence bias. This may have made it more difficult for them to come to a decisive conclusion about what to do in that situation. Though they give more weight to positives than the average person, they are still not necessarily giving the differential weight required to the positive aspects to make a decision within the time limits.

Second, participants with a more positive weighting bias may have been more likely to miss trials as a strategy. It may be that while it was of primary importance for those with a negative weighting bias to be vigilant in avoiding novel stimuli – as reflected in their increased avoidance behavior – it may be of primary importance for those with a positive weighting bias to concentrate on approaching novel stimuli. In concentrating on approaching rather than avoiding, participants with a positive weighting bias may have simply allowed time to run out when they did not wish to approach. Indeed, when participants did not respond on a trial, it was functionally equivalent to avoiding; in both
cases, no further information was acquired and points were not gained or lost. Thus, while those with a negative weighting bias may have been concerned with actively avoiding, those with a positive weighting bias may have attended only to approach-oriented decisions.

The question may also be raised as to why there appeared to be not just a smaller relation between the weighting bias and DonutFest behavior in the unrestricted condition, but a null relation. It could be that the weighting bias was not as pivotal in this condition as participants were able to use explicit strategies to explore their novel environment. When given extra time, participants had the opportunity to think over and strategize on their decisions and probably spent more time considering the extent to which a current donut resembled one that they had seen recently. Simply put, the weighting bias may no longer have been as relevant when participants were able to theorize and make predictions about the characteristics of the donuts that might be related to positivity or negativity. The weighting bias may have exerted some initial influence on participants’ appraisals of a given donut, but those appraisals would be updated and modified as participants in the unrestricted condition utilized their developing theories and predictions regarding the visual appearances of positive versus negative donuts.

Overall, it appears that the time restriction utilized in this study enhanced the strength of the relation observed between individuals’ weighting bias scores and their sampling behavior in a novel environment. On the basis of these results, it appears that the weighting bias can be considered to play a role in the development of an initial default response.
CHAPTER 3: MOTIVATING THE DESIRE TO OVERRIDE THE DEFAULT WEIGHTING BIAS RESPONSE

After restricting participants’ opportunity to override their default weighting bias response, we also wanted to manipulate a second important variable according to the MODE model, namely participants’ motivation to follow or override their default. Based on the tenets of the MODE model, we hypothesized that giving participants reason to override their default weighting bias should lead to less correspondence between the weighting bias and behavior while giving participants reason to follow their default weighting bias should lead to greater correspondence.

In this study, we utilized the Balloon Analogue Risk Task (BART; Lejuez et al., 2002), which is often used as a proximate measure of risk-taking. The BART measures how many times participants are willing to pump up a virtual balloon in order to gain points; thus, participants have to weigh the risk of popping the balloon and receiving no points from that round, or to pump the balloon fewer times, but also earn fewer points overall. Past research has indicated self-reported risk-taking in health and safety domains is related to greater risk-taking in the BART (Lejuez et al., 2002, 2004; Lejuez, Aklin, Jones et al., 2003). Further research has shown that a more positive weighting bias is related to more pumps on the balloons while a more negative weighting bias is related to fewer pumps on the balloons (Pietri, Fazio, & Shook, 2011). These findings indicate that those with a positive weighting bias may be giving greater weight to the relative positive
outcome of earning incrementally more points compared to the relative negative outcome of popping the balloon and losing points.

Explicitly stated, then, when motivated to follow their default bias, participants should replicate the original finding that the more positive individuals’ weighting bias, the more they should be willing to pump up the balloon and risk it popping. When motivated to override their bias, however, this relationship should be attenuated.

METHOD

Overview

Participants entered the lab and were told they were participating in three separate studies. For the first study, participants were told they would be playing a game called BeanFest in order to see how individuals navigate novel environments. As in Study 1, we used BeanFest to measure participants’ weighting bias. After being given a fake debriefing about BeanFest, participants were re-consented for what they believed was the second study. During this portion of the study, participants read three newspaper articles and were asked to rate them on their clarity, conciseness, and entertainment value. This part of the study constituted the manipulation. For half of the participants, the final article they read was a summary of scientific research reporting the findings that following one’s intuition leads to a longer, healthier, and more successful life. The other half of the participants read a similar final article, but one that reported that overriding or overcoming one’s initial intuition leads to a longer, healthier, and more successful life. After again being given a fake debriefing and then being re-consented, participants completed the BART. Finally, participants completed the REI as in Study 1.

Participants
Participants were 61 (35 male and 26 female) introductory psychology students who completed the experiment for class credit. Two participants were excluded for pumping lower than three standard deviations below the mean on the BART. A total of 59 participants remained for subsequent analyses (33 male and 26 female).

Procedure

BeanFest. As with Study 1, participants played BeanFest in order to obtain behavioral estimates of their weighting bias.

Motivation manipulation. Participants were told that this second portion of the study was in collaboration with a newspaper in order to assess the kinds of psychology articles students their age find most appealing. To this end, participants read three different articles and rated each on how clear, concise, and entertaining they were. In fact, the first two articles – an article on autism and an article on sleep deprivation – were held constant across the two conditions while the final article differed based on condition.

For half of the participants, the final article they read was ostensibly a summary of scientific research showing that following one’s intuition or gut-instinct leads to a longer, healthier, and more successful life (“follow” condition; see Appendix B). The other half of the participants read a final article that was nearly identical to the other condition’s article, but instead indicated the research showed that overriding one’s intuition or gut-instinct leads to a longer, healthier, and more successful life (“override” condition; see Appendix C).

BART. In the BART, participants were presented with 20 trials where they were required to decide how many times they wished to pump up a virtual balloon. Each time they wanted to pump the balloon, participants clicked a button on the lower left-hand of
their screen labeled “Pump up the balloon.” Each time they pumped up the balloon, participants potentially earned fake money (5¢). They were not allowed to add this money to their total, however, if they did not press the “Collect” button before the balloon popped. Thus, participants needed to constantly weight the relative negative outcome of popping the balloon and losing all of their money with the relative positive outcome of pumping the balloon one more time and earn more money. After popping the balloon or collecting their earning for that trial, a new balloon was displayed and participants played the game again with this new balloon. The maximum number of pumps was set to 25 for each balloon. The a priori probability of a balloon exploding on any given pump was thus 1/25. If the balloon did not pop on the first pump, the probability that the balloon would pop on the second pump would be 1/24, 1/23 on the third pump, and so on until the balloon popped or a participant had pumped 25 times (i.e., reached a probability of 1/1 that the balloon would pop). Participants were not given these probabilities, but were simply told to “earn as much fake money as possible.” It was thus open to participants as to how best to go about this.

**REI.** After the BART, participants filled out the REI questionnaire. The Rationality ($\alpha = .89$) and Experiential ($\alpha = .92$) subscales again showed good reliability.

**RESULTS**

**Manipulation check.** If they were relying less on a default bias to make decisions in the “override” condition, then participants in this condition should have indicated that they are able to and actually utilize intuitive thinking and decision making less than those in the “follow” condition when filling out the REI. Those in the “override” condition ($M$
did indeed indicate lower scores on the Experiential subscale compared to those in the “follow” condition ($M = 3.66$), $t(57) = 3.73, p < .001$. These differences were evident in both participants’ self-reported ability to use intuitive thinking and their actual use of intuitive thinking (both $ps < .01$).

There was also some indication that the manipulation affected the extent to which participants indicated they used rational thinking in decision making. With those in the “override” condition ($M = 3.85$) indicating higher values than those in the “follow” condition ($M = 3.60$), $t(57) = 1.61, p = .11$. These differences were trending in the same direction in both participants’ self-reported ability ($p = .13$) and actual use of rational thinking ($p = .16$).

Thus, the manipulation appears to have been successful in decreasing participants’ self-reports of using a more intuitive thinking style and increasing their use of a more rational thinking style.

**BART.** Do these changes carry over into actual behavior? The answer appears to be ‘yes.’ Participants’ weighting bias was related to pumping behavior, but only in the “follow” condition. Specifically, the more positive their weighting bias, the more times participants pumped the balloon in the “follow” condition (see Figure 5). These results were obtained using a multiple regression equation predicting total pumps from condition (“follow” vs. “override”), weighting bias, and their interaction. There was a main effect of weighting bias ($B=9.14, t(55) = 1.98, p = .05$) indicating that, regardless of condition, the more positive participants’ weighting bias, the more they pumped. The only other significant effect was the predicted condition by weighting bias interaction ($B=-11.26, t(55) = 2.44, p < .05$). A simple slopes analysis revealed that those with a more positive
weighting bias pumped more than those with a more negative weighting bias when in the “follow” condition ($B=20.39$, $t(55) = 2.84, p < .01$), but not the “override” condition ($B=-2.12$, $t(55) = .36, p = .72$).

**DISCUSSION**

The results from this second experiment give additional support to the idea that the weighting of positives and negatives is a default bias that can be used in decision making. Those participants who were motivated to override their initial default bias did not show a relationship between the weighting bias and total balloon pumps while those who were motivated to follow their bias showed the hypothesized relationship. Though it is ambiguous as to whether motivating participants to follow their default bias at all strengthened the existing relationship between pumping behavior and the weighting bias as there was no control condition, it is readily apparent that those who were motivated to override this bias did so.

As with the first block of the DonutFest paradigm, the BART also contains very little information and represents an environment where participants can have few expectations or theories to inform their decision making. Indeed, as in Study 1, it appears that participants do not make decisions at random when given little information, but instead may rely on the extent to which they weight positives over negatives or vice versa. As discussed in the introduction and again subsequently in the general discussion, it is precisely in these situations where the weighting bias should have its largest impact on decision making.
CHAPTER 4: GENERAL DISCUSSION

The central question addressed in the present research was how individuals make decisions in situations where they have very little substantive knowledge or theory to use in order to navigate these difficult situations. Across two experiments, substantial evidence has been obtained that the extent to which individuals weight the positive and negative aspects of a situation or stimulus may be an initial default response individuals use to make decisions in ambiguous situations. Both of the dependent measures employed in the experiments, DonutFest and the BART, represent novel environments where participants had no previous knowledge. Given this lack of knowledge, participants appeared to rely on their weighting bias when they either had little time to do otherwise, or when they were not motivated to deliberate.

In Study 1, participants with a more negative weighting bias who had little time to override their default response avoided more novel stimuli. Furthermore, when participants had a more positive weighting bias, they approached a greater proportion of novel stimuli when they actually did make a decision. Finally, it was also found that individuals were quicker to respond when making bias-congruent as opposed to bias-incongruent decisions. In Study 2, participants who were motivated to override their default response showed no correspondence between their weighting bias and our behavioral risk-taking measure. Those who were motivated to follow their default response showed a strong relationship between their weighting bias and their propensity
for risk-taking. Specifically, those with a more positive weighting bias took more risks than those with a negative weighting bias.

These results are in line with dual-process models of behavior, and in particular the MODE model, indicating that when they have both sufficient motivation and opportunity, individuals will tend to use a more deliberative processing style and rely less on any default response they may have (Fazio, 1990; Olson & Fazio, 2009).

*Implications*

More generally, the findings here demonstrate the fruitful application of the behavioral paradigm used in these studies, BeanFest, in measuring an individual’s fundamental weighting of positive versus negative. In this, as well as in other research, it has been demonstrated that the weighting bias measured in BeanFest is related to a number of different judgments and downstream consequences across domains (Pietri, Fazio, & Shook, 2011). As individuals all begin BeanFest without prior experience, BeanFest itself represents a pure measure of how individuals weight positives versus negatives. Unlike other research that may rely on the valenced meaning of words or on positive or negative pictures, BeanFest is a context-free measure that is unencumbered by previous experience within a domain. Thus, as a context-free measure, BeanFest can allow for a potentially better measurement of an individual’s weighting bias. Due to this measurement approach as well as the low-level nature of valence in general, the weighting bias represents a fundamental bias that can influence individuals’ behavior across a number of different domains.

By demonstrating the weighting of positive versus negative as an initial starting point for individuals when making a judgment or decision, the current research also
points to a fundamental way in which individuals navigate their environments and the world in general. Upon entering a novel environment that requires decision making, individuals will make use of the cues available to them. In many cases, however, their prior evaluative knowledge may provide little or no guidance regarding this decision process; for example, this occurs when they have little prior experience, a lack of substantive associations or theories, or hold theories that simply do not help within the domain. In situations like these, individuals will need to engage in at least some form of consideration – whether it be more or less quick – to make a decision. They appear to begin such a decision-making process in a somewhat systematic matter by integrating and then weighting the overall known positive and negative features of their environments. Indeed, individuals’ idiosyncratic tendencies toward valence weighting appear to provide a starting point from which they begin to consider the potential tradeoffs involved and arrive relatively quickly at an overall, gestalt assessment of the situation. It is thus precisely in these cases involving little information or substantive expectations when having a default tendency to weight one valence more than the other is most useful in coming to a decision. After this initial valence weighting, individuals may then deliberate and further reflect on this initial judgment, provided they have both the motivation and opportunity to do so.

Furthermore, while the current research has emphasized the default nature of the weighting bias, the present findings show that it may also have longer-term consequences. For example, while participants did not show correspondence between their weighting bias and decision-making after the first game block of Study 1, the effects of an individual’s weighting bias could be seen throughout all 20 trials of the balloon task.
in Study 2. This reliance on the weighting bias throughout the BART is likely due to the fact that individuals were not necessarily gaining more information as the trials progressed. Indeed, while participants in Study 1 were able to learn about the donuts across the different game blocks as their values remained constant, it may have been difficult for participants to fully learn the complicated pattern in the BART as a balloon could pop on anywhere from the first to the 25th pump. These results are in line with the hypothesis that the weighting bias should be most helpful in those situations where individuals have relatively little knowledge. Thus, while the current results emphasize the initial, quick, and default nature of the weighting bias, these starting points can influence behavior in situations even when participants are not rushed into decisions (Pietri, Fazio, & Shook, 2011).

*Future directions*

Though the results here indicate that the weighting bias may be a default response within the novel environments used in this study, it would be important to extend the weighting bias as a default response across a number of disparate domains. As the weighting bias has been shown to relate to judgments ranging from rejection sensitivity to risk propensity, it is similarly likely that the weighting bias would be used as a default response across these other domains as well.

The nature of our hypotheses on how the weighting bias operates would suggest, for instance, that we should see distinct differences between experts and non-experts in a given domain. For individuals who have substantial knowledge in the field, the weighting bias should be relied upon to a lesser extent in decision making compared to those who are only just entering the field. The substantive knowledge may very well foster a
judgment that runs counter to the direction of the individual’s valence asymmetry.

Furthermore, in the realm of stereotyping and prejudice, those individuals who endorse stereotypes of certain groups should rely on these stereotypes when making a judgment about an ambiguous behavior as executed by a stereotyped individual. Those who do not hold or endorse these stereotypes may lack any substantive knowledge by which to assess the target individual. Instead, they may aggregate the salient positive and negative characteristics that the individual is displaying. Any such aggregation will involve their fundamental valence weighting tendencies.
LIST OF REFERENCES


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*Figure 1.* Bean Matrix. X: shape of bean, from oval (1) to oblong (10). Y: number of speckles on bean, from 1 to 10. The cells with a point value present the beans presented during the game.
Figure 2. Regression lines relating the weighting bias to avoidance behavior in DonutFest as a function of condition.
Figure 3. Regression lines relating the weighting bias to missed trials in DonutFest as a function of condition.
Figure 4. Regression lines relating the weighting bias to proportion of donuts approached in DonutFest as a function of condition.
Figure 5. Regression lines relating the weighting bias to balloon pumps in the BART as a function of condition.
APPENDIX B: “FOLLOW INTUITION” NEWSPAPER ARTICLE

Trusting gut-reactions leads to the best decisions

By NICHOLAS ROBINSON
Published: August 29, 2010

Oftentimes when we are faced with a tough decision, we are unsure of what to do. Is it best to mull over the problem or to make a decision relatively quickly? Recently, scientists at Harvard have found that people who tend to make decisions based on their first gut feeling or intuition tend to live longer, lead happier lives, and make decisions that are better in the long run.

“We find that when people are faced with non-emotional decisions in the lab and then make decisions based on their intuition or gut feeling, they tend to be right more often than people who question their initial reactions. We also find that when we follow these participants across time, they tend to live longer and even their friends and significant others report them as being happier,” said Harvard professor Dr. Steven Frap.

The researchers believe these outcomes are based on the fact that our brain can do calculations and make considerations that we are only partially aware of. Dr. Frap uses the example of walking: “when you’re walking, you aren’t calculating each step methodically, you just do it. Beneath the surface, though, your brain is making all sorts of calculations that you couldn’t possibly keep track of consciously. As soon as you start thinking about walking, it becomes much more difficult.”

Dr. Frap cautions that sometimes we can hit some bumps in the road when following our gut-reactions, but that research shows that those bumps occur to an even greater extent if we override these gut-reactions.
Overcoming gut-reactions leads to the best decisions

By NICHOLAS ROBINSON
Published: August 29, 2010

Oftentimes when we are faced with a tough decision, we are unsure of what to do. Is it best to mull over the problem or to make a decision relatively quickly? Recently, scientists at Harvard have found that people who tend to make decisions that overcome their first gut feeling or intuition tend to live longer, lead happier lives, and make decisions that are better in the long run.

“We find that when people are faced with decisions in the lab and then make decisions that extend beyond or even overcome their intuition or gut feeling, they tend to be right more often than people who trust their initial reactions. We also find that when we follow these participants across time, they tend to live longer and even their friends and significant others report them as being happier,” said Harvard professor Dr. Steven Frap.

The researchers believe these outcomes are based on the fact that our brain can often make decisions automatically and too quickly without enough information. As Dr. Frap puts it: “when we embrace our initial reactions, we do things that are sometimes the exact opposite of what we should do. For example, when we are upset with our significant other, it is often best to do the exact opposite of what our gut tells us to do, which is to get mad and yell. Our research extends this into everyday decision making: if we move beyond and override our initial reactions, we get better outcomes even for everyday non-emotional decisions as well.”

Dr. Frap cautions that sometimes we can hit some bumps in the road when overcoming our gut-reactions, but that research shows that those bumps occur to an even greater extent if we trust these gut-reactions.