

An Examination of Ambivalence: When Cognitive Conflicts Can Help
Individuals Overcome Cognitive Traps

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Abstract

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Ambivalence has become a common psychological state in organizations. Although most of the literature on ambivalence has focused on its dysfunctional outcomes associated with defensive and coping mechanisms, this dissertation explores its functional outcomes related to deliberative cognitive processes. My initial assumption is that individuals experiencing ambivalence go through a psychological state dominated by cognitive fluidity, which prompts individuals to investigate the root causes of their discomfort and become aware of relevant contextual cues. Considering that leaders and followers need to integrate conflicting information in complex and dynamic contexts, experiencing ambivalence can have functional outcomes. As such, in this dissertation, I explore the influence of ambivalence—a cognitive conflict caused by concurrent opposite evaluations—on contextual interpretation and decision-making. To this end, this research is divided into three interrelated chapters. The central goal in Chapter 1 is to develop a theoretical model that describes when and how ambivalence in complex situations can lead to

functional leadership processes and decision-making outcomes. I propose four processes that result from leader-follower shared ambivalence (i.e., sense-jumping, upward sense-giving, downward sense-giving, and sense-building), and outline four corresponding decision-making outcomes (i.e., automatic inference, issue selling, subordination, and joint contextual interpretation). I also describe specific boundary conditions (i.e., time availability, decision frequency, and expertise) that constrain the proposed processes. Moving from the dyadic level to the individual level, in Chapter 2, I focus on the effects of ambivalence on individual decision-making processes. Building upon social cognition theory, I offer a model in which identification of the causes of ambivalence can counteract adverse coping and defensive mechanisms associated with the dysfunctional outcomes of ambivalence. I put forth an intrapsychological model of identified ambivalence. Within this model, I argue that identified ambivalence leads to effective decision-making through two mechanisms: contextual awareness and moral awareness. Additionally, I propose two first-stage moderators for this framework. The first moderator is trait self-control, which influences the strength of the relationship between identified ambivalence and contextual awareness. The second is perceptual moral attentiveness, which affects the strength of the relationship between identified ambivalence and moral awareness. In a series of four studies, the hypotheses were supported. Taken together, Chapter 2 advances the current knowledge of ambivalence theory by explaining why, how, and when ambivalence can result in functional outcomes. I conclude my dissertation in Chapter 3 by proposing potential future avenues for studying identified ambivalence. Specifically, I propose that future research should investigate the effects of identified ambivalence on group dynamics and group decision effectiveness, and examine the relationship between identified ambivalence and organizational structure (i.e., information structure and process structure).

Dedication

I would like to dedicate this doctoral dissertation to my family and friends. I feel a special sense of gratitude for my wife, Karina Guarana. There is no doubt in my mind that without her continued support I could not have completed this process. In our journey, Karina gave birth to our lovely daughter just before my General Exam. It was the happiest day of my life and encouraged me to finish my degree and start my career as an academic. Thank you so much Sophia for being such a wonderful daughter, and Karina for being an amazing woman, wife, and mother. I love you both!

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Table of Content

Introduction.....	1
Chapter 1 – Building Sense Out of Situational Complexity: The Role of Ambivalence in Creating Functional Leadership Processes.....	4
Abstract.....	4
Introduction.....	5
Exploring the Construct of Ambivalence.....	7
Intrapersonal Dynamics.....	7
Interpersonal Dynamics.....	9
Shared Ambivalence.....	12
Theoretical Model.....	15
Influence of Situational Complexity on Ambivalence.....	15
The Moderating Role of Proximity in Influencing Leader-Follower Shared Ambivalence.....	18
Physical Proximity.....	18
Relational Proximity.....	19
Outcomes of Leader-Follower Interpersonal Ambivalence.....	20
Automatic Inference.....	21
Issue Selling.....	23
Subordination.....	24
Joint Contextual Interpretation.....	25
Boundary Conditions of the Effect of Ambivalence in Leadership Processes.....	27
The Role of Time Availability in Ambivalence and Leadership Processes.....	28

The Role of Decision Frequency in Ambivalence and Leadership Processes..	29
The Role of Expertise in Ambivalence and Leadership Processes.....	30
Discussion.....	31
Theoretical Contributions.....	32
Practical Implications.....	36
Conclusion.....	37
 Chapter 2 – Identified Ambivalence: Overcoming Structural and Cognitive Evaluative	
Problems.....	38
Abstract.....	38
Introduction.....	39
Exploring the Construct of Ambivalence.....	42
Attitudinal Ambivalence.....	42
Identified Ambivalence and Functional Outcomes.....	45
Theoretical Framework for Identified Ambivalence.....	47
Hypotheses Development.....	51
The Mediating Roles of Contextual Awareness and Moral Awareness.....	52
The Moderating Roles of Trait Self-Control and Perceptual Moral Attentiveness..	55
Overview of Empirical Studies.....	58
Study 1: Identified Ambivalence and Decision Effectiveness.....	59
Participants.....	59
Procedures.....	59
Measures.....	60
Results and Discussion.....	61

Manipulation Check.....	61
Ambivalence and Decision.....	62
Study 2: Generalizability of Identified Ambivalence Effects on Cognitive	
Limitations.....	66
Participants.....	66
Procedures.....	66
Measures.....	67
Results and Discussion.....	68
Manipulation Check.....	68
Ambivalence and Decision.....	69
Study 3: Identified Ambivalence, Contextual Awareness, Moral Awareness, and	
Decision Effectiveness.....	72
Participants.....	72
Procedures	72
Measures.....	73
Results and Discussion.....	74
Study 4: Identified Ambivalence, Trait Self-Control, and Perceptual Moral	
Attentiveness.....	80
Participants.....	80
Procedures	80
Measures.....	80
Results and Discussion.....	81
General Discussion.....	94

Theoretical Contributions.....	94
Practical Implications.....	96
Limitations and Future Directions.....	97
Conclusion.....	99
Chapter 3 – Looking Ahead: Potential Avenues for Identified Ambivalence.....	101
Identified Ambivalence and Group Dynamics.....	101
Identified Ambivalence and Organizational Structure.....	103
General Conclusions.....	105
References.....	106
Appendix A: Framing Exercise.....	132
Appendix B: Genetically Modified Food Manipulation.....	133
Appendix C: Word Completion Exercise.....	137

List of Tables

Table 1: Descriptive Statistics and Correlations for Study 1 Variables.....	61
Table 2: Logistic Regression of Identified Ambivalence on Decision for Study 1.....	66
Table 3: Descriptive Statistics and Correlations for Study 2 Variables.....	68
Table 4: Logistic Regression of Identified Ambivalence on Decision for Study 2.....	72
Table 5: Descriptive Statistics and Correlations for Study 3 Variables.....	75
Table 6: Regression Results for Parallel Mediation in Study 3.....	79
Table 7: Descriptive Statistics and Correlations for Study 4 Variables.....	82
Table 8: Logistic Regression of Identified Ambivalence on Decision for Study 4.....	86
Table 9: Regression Results for Parallel Mediation in Study 4.....	87
Table 10: Regression Results for Conditional Indirect Effect through Contextual Awareness in Study 4.....	90
Table 11: Regression Results for Conditional Indirect Effect through Moral Awareness in Study 4.....	93

List of Figures

Figure 1: Theoretical Model for Chapter 1	15
Figure 2: Conceptual Model for Chapter 2	42
Figure 3: Gain Contextual Framing for Study 1	63
Figure 4: Loss Contextual Framing for Study 1	63
Figure 5: Gain Contextual Framing per Cognitive State Study 1	64
Figure 6: Loss Contextual Framing per Cognitive State for Study 1	65
Figure 7: Gain Contextual Framing Condition for Study 2	70
Figure 8: Loss Contextual Framing Condition for Study 2	70
Figure 9: Gain Contextual Framing Condition per Cognitive State Study 2	71
Figure 10: Loss Contextual Framing Condition per Cognitive State for Study 2	71
Figure 11: Gain Contextual Framing Condition for Study 3	76
Figure 12: Loss Contextual Framing Condition for Study 3	76
Figure 13: Gain Contextual Framing Condition per Cognitive State Study 3	77
Figure 14: Loss Contextual Framing Condition per Cognitive State for Study 3	77
Figure 15: Gain Contextual Framing Condition for Study 4	84
Figure 16: Loss Contextual Framing Condition for Study 4	84
Figure 17: Gain Contextual Framing Condition per Cognitive State Study 4	85
Figure 18: Loss Contextual Framing Condition per Cognitive State for Study 4	85
Figure 19: The Interactive Effect of Identified Ambivalence and Trait Self-Control on Contextual Awareness for Study 4	89
Figure 20: The Interactive Effect of Identified Ambivalence and Perceptual Moral Attentiveness on Moral Awareness for Study 4	91

Introduction

Broadly defined as a psychological state caused by contrasting evaluative orientations (positive and negative) toward an object, which influences individual's decision-making or behaviors (Baek, 2010; Priester & Petty, 2001; Zaller, 1992), ambivalence has long been studied in social disciplines (e.g., Katz & Stotland, 1959; Rosenberg & Hovland, 1960; Smith, 1947). More recently, the interest in ambivalence has regained momentum and social psychologists (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Priester & Petty, 1996), political scientists (Alvarez & Brehm, 1997; Huckfeldt, Mendez & Osborn, 2004; Mutz, 2006) sociologists (Hillcoat-Merton, 1976; Nalletamby & Philips, 2011) and organizational behaviorists (Molinsky, 2013; Pratt, 2000; Pratt & Doucet, 2000; Wang & Pratt, 2008) have deepened our understanding of its antecedents and consequences.

The recent increase in scholarly interest in ambivalence perhaps suggests that individuals are more frequently experiencing this type of cognitive conflict in organizations. As environments become more complex, individuals need to balance a broader set of conflicting information that has the potential to trigger ambivalence. For instance, research on complexity (Kauffman, 1993) suggests that individuals embedded in complex situations experience an unstable cognitive state between order and disorder that consumes cognitive resources, increases vulnerability to situational cues, and likely activates strong and opposite cognitions (c.f. ambivalence, Pratt & Doucet, 2000).

Such complexity creates a cognitive paradox. On the one hand, a comprehensive investigation of all possible contextual interdependencies and their consequences overwhelms individual's limited cognitive capacity (Baars, 1997; Simon, 1979; Wilson, 2004); on the other hand, individuals are vulnerable to cognitive biases that often produce a simplistic analysis of the

most proximal information (Kahneman, 2011). Indeed, research on organizational decision-making has suggested that managers have limited cognitive resources and attend to a biased subset of contextual cues (e.g., Lehman & Ramanujam, 2009). In general, these cognitive shortcomings lead to omissions in managers' assessments of important causal relationships (Serman, 1994). In this dissertation, I ask: How can individuals solve this paradox? To address this question, my research sheds light on how and when individuals minimize the invasive effects of cognitive traps when interpreting organizational contexts and making decisions.

This dissertation is divided into three interrelated chapters. In Chapter 1, I focus on the dyadic-level of analysis and propose a theoretical model of situationally induced ambivalence in leadership processes. My starting point is that leaders and followers experiencing ambivalence can expand their cognitive interpretative boundaries by remaining open to a broad set of interrelated alternatives and deepen their cognitive evaluations by having to ultimately resolve their contrasting evaluative orientations to reach a conclusion. I propose that physical and contextual proximity can accentuate or attenuate the degree to which leaders and followers share ambivalent cognitive states. I then examine how different cognitive processes (i.e., sense-jumping, upward sense-giving, downward sense-giving, and sense-building) can not only arise from leader-follower shared ambivalence (or lack thereof), but also lead to different outcomes (i.e., automatic inference, issue selling, subordination, and joint contextual interpretation). Finally, I present three boundary conditions to this theoretical model (i.e., time availability, decision frequency, and expertise).

In Chapter 2, I focus on the individual-level of analysis, and further explore why, when, and how ambivalence can lead to functional outcomes. Specifically, I propose that identifying the causes of ambivalence can counteract adverse coping and defensive mechanisms associated

with the dysfunctional outcomes of ambivalence. Drawing on social cognition theory, I offer a view in which *identification* of incongruent beliefs and opinions (i.e., felt ambivalence; Jamieson, 1993; Priester & Petty, 1996) can facilitate the detection of hidden contextual and moral cues. Then, I propose that this attention driven process, triggered by identified ambivalence, is positively related to decision effectiveness (Studies 1 and 2) through contextual and moral awareness (Study 3). Finally, I demonstrate that these effects are stronger when individuals experience low as compared to high levels, of trait self-control and perceptual moral attentiveness (Study 4).

In Chapter 3, I put forth avenues for future research. Specifically, future scholars should investigate the effects of identified ambivalence on group dynamics and decision effectiveness. Group members have information and preferential biases that leave unshared information unused in decision-making processes. Such biases result in unbalanced decisions. Identified ambivalence can shed light on how psychological states influence information sharing processes in groups. In addition, the network structure of the group can also influence the information flow among group members. Group member centrality can be critical for maximizing the effects of identified ambivalence in group decisions. Finally, organizational structure is a proximal contextual factor that can influence the strength of the relationship between situational complexity and ambivalence. In particular, future research should investigate if information and process structures augment or dampen the effects of situational complexity on identified ambivalence. I conclude that future research should expand the level of analysis of identified ambivalence to groups and incorporate organizational structures as potential drivers of and conditions for identified ambivalence.

Chapter 1 - Building Sense Out of Situational Complexity: The Role of Ambivalence in Creating Functional Leadership Processes

Abstract

There is growing consensus among scholars that the organizational environment has become increasingly complex, dynamic, and socially demanding. Leaders and followers navigate through a cognitive paradox where assessments of the situation can be at once cognitively overpowering and cognitively deceiving. In this Chapter, I propose that complex situations can lead to ambivalence, a psychological state caused by contrasting evaluative orientations toward an object or situation. I propose that ambivalence can become a functional cognitive process that provides cognitive discomfort and fluidity for joint contextual interpretation when leaders and followers share ambivalent cognitive states. I develop a theoretical model of how this process unfolds, highlighting how and when situational complexity can trigger leader and follower ambivalence leading to distinct interpretative processes. Taken together, I explain how ambivalence can facilitate collaborative contextual interpretation within complex situations. In so doing, I advance the current understanding of ambivalence by explicating its role in creating functional leadership processes.

Introduction

Kauffman (1993) noted that complex situations reside near the edge of chaos. Within this situational complexity, leaders and followers experience both order and disorder that can consume their cognitive resources and increase their vulnerability to situational cues (Nisbett & Ross, 1980; Starbuck & Milliken, 1988; Wyer & Carlston, 1979). Thus, a cognitive paradox exists when comprehensive assessments of the situation can be cognitively overpowering, while simplified examinations can be cognitively deceiving. Notably, complexity can activate strong and opposite cognitions (i.e., ambivalence, Priester & Petty, 1996) in leaders and followers. Complex situations can lead to ambivalent states and distract leaders and followers from optimal contextual interpretations by activating coping mechanisms that bypass deep cognitive processing (Conner & Amitage, 1998), creating speculative interdependences (Lavine, Borgida, & Sulliva, 2000). Indeed, the majority of the literature on ambivalence has characterized it as a dysfunctional cognitive process (van Harreveld, Pligt, & Liver, 2009); hence, functional processes associated with ambivalence have remained relatively understudied. Little is known about how leaders and followers can most effectively make sense of their ambivalent states to arrive at joint interpretations of complex contexts.

I propose that when leaders and followers experience ambivalence – defined as a psychological state caused by contrasting evaluative orientations toward an object or situation (Baek, 2010; Priester & Petty, 2001) – *about the same situation*, contextual interpretation can be facilitated in two ways. First, leaders and followers optimize the use of their limited cognitive resources by drawing on a more expansive but relevant set of options provided by their counterpart. Second, leaders and followers minimize the influence of heuristic processing because they are mutually motivated to engage in deep cognitive processing to accurately

identify the cause of their conflict. Thus, ambivalence can allow leaders and followers to both *expand* their cognitive interpretative boundaries by remaining open to a broad set of interrelated alternatives and *deepen* their cognitive evaluations by having to ultimately resolve their contrasting evaluative orientations to reach a conclusion.

The purpose of this Chapter is to develop a theoretical model of situationally-induced ambivalence in leadership processes that explains how ambivalent states held by leaders and followers can interact at the dyadic level to create different decision-making outcomes. Considering that leadership is a socially dynamic process, in which leaders and followers reciprocally influence one another to accomplish collective goals (DeRue, 2011; Eberly, Johnson, Hernandez, & Avolio, 2013; Hernandez, Eberly, Avolio, & Johnson, 2011; Yukl, 2010), I propose that leaders and followers can share ambivalent cognitive states that create different contextual interpretative processes. Specifically, I examine how different cognitive processes (i.e., sense-jumping, upward sense-giving, downward sense-giving, and sense-building) can arise from leader-follower shared ambivalence (or lack thereof), and lead to different outcomes (i.e., automatic inference, issue selling, subordination, and joint contextual interpretation).

Moreover, I investigate how physical and relational proximity can accentuate or attenuate the degree to which leaders and followers share ambivalent cognitive states. With regards to physical proximity, shared cognition theory (Cannon & Edmondson, 2001) and shared reality theory (Hardin & Conley, 2001; Hardin & Higgins, 1996) postulate that individual cognitions and interpersonal relationships are mutually constructed and maintained through the establishment of shared beliefs. In line with this rationale, I suggest that leaders and followers who are physically proximal are more likely to experience similar contextual characteristics;

similar stimuli will be salient and vivid under these circumstances (Fiske & Taylor, 1984). With regards to relational proximity, I propose that leaders and followers who have a high quality relationship with each other enjoy relational proximity and are more likely to share information about complex situations (Van Dyne, Kamdar, & Joireman, 2008). Indeed, leader-member exchange (LMX) theorists have shown that quality of the relationship between leaders and followers is positively related to both the amount and quality of exchanged information (Sias, 2005).

I begin my examination with an overview of the literature on ambivalence at the intrapersonal level and then build theory on the interpersonal dynamics of ambivalence in leadership processes. I put forth a theoretical model that explains how situational complexity can influence leader-follower shared ambivalent states and unpack how these states can influence decision-making pathways and outcomes. I then detail the specific boundary conditions (i.e., time availability, decision frequency, and expertise) that constrain my proposed model. Although I acknowledge that my focus on dyadic relationships is an oversimplification of the multi-level leadership processes that occur within organizations, I adopt this perspective as a starting point to understand how ambivalence can influence collaborative contextual interpretation

Exploring the Construct of Ambivalence

Intrapersonal Dynamics

Before theorizing about the role of ambivalence in interpersonal leadership processes, it is necessary to first understand the intrapersonal dynamics of attitudinal ambivalence. In his seminal work, Allport (1935) argued that much of the richness of the attitudinal construct is lost with unidimensional bipolar models. It was only in the late 1950's when researchers started to theorize about multidimensional models and separated the components of different types of

attitudes (e.g., Katz & Stotland, 1959; Rosenberg & Hovland, 1960). These models suggested that individuals' overall evaluations result from generalized expressions of positivity *and* negativity regarding an object or situation. Nonetheless, most researchers continued to treat attitudes as unidimensional bipolar summary statements through the 1980's (Fazio, 1986), despite neurophysiological evidence showing that negative and positive evaluations are independently processed by different parts of the brain (e.g. Ahern & Schwartz, 1985; Damasio, 1994; Delgado, Roberts, & Miller, 1954; Olds & Milner, 1954), and thus can both be activated simultaneously. The potential to have positive and negative evaluations at the same time suggests that individuals can experience ambivalence; that is, a psychological state caused by strong and opposite evaluative orientations toward an object or situation (Priester & Petty, 1996).

What is often studied as “felt” ambivalence (e.g. Jamieson, 1993; Priester & Petty, 1996) refers to levels of experienced psychological conflict that results from the awareness of strong incongruent beliefs and opinions. Accordingly, distinct from indifference, which does not activate internal conflict or require psychological involvement or arousal (Cacioppo & Berntson, 1994), ambivalence requires the awareness of incongruent evaluations that lead to different psychological states. Moreover, ambivalence is similar to a state of cognitive dissonance that can exist when an individual is in doubt about two conflicting alternatives. This doubt, however, is not resolved as the knowledge about a target increases; rather, ambivalence about which option to choose is generally heightened with more information about each target. Whereas individuals experiencing cognitive dissonance are conflicted about a committed behavior that is misaligned with their attitudes (van Harreveld et al., 2009), individuals experiencing ambivalence are conflicted about two potential behavioral options regardless of congruency with their attitudes. Thus, individuals experiencing ambivalence have not yet committed to an attitude, and

consequently, one behavioral choice.

When individuals who are experiencing ambivalence need to make a decision, they often seek to minimize their cognitive discomfort (Katz, 1981; Katz & Hass, 1988), which can ultimately lead to biased heuristic processing. That is, individuals often attempt to avoid cognitive conflict by bypassing the contextual interpretation process and making quick, volatile decisions (Conner & Armitage, 1998). For instance, indirect evidence that ambivalent individuals may employ such a strategy is provided by Lavine, Borgida, and Sullivan (2000), who showed that attitude involvement, which tends to be high for ambivalent attitude holders, leads to biased information-gathering strategies, low attitude intention, and a weak relation between attitudes and behavior. Crucially, if the ambivalent individual is *not able to identify* the causes of his or her cognitive discomfort, speculations influence his or her cognitive elaboration. In these situations, individuals are highly susceptible to situational cues, automatic influences, and cannot detect the need to override heuristic responses.

Interpersonal Dynamics

I propose that at the dyadic level, ambivalence within leader-follower interpersonal interactions can create functional outcomes by expanding their investigation and deepening their cognitive processing. To elaborate on the first of these two points, I draw from Fiske and Taylor's (1984) social-cognitive theory, which suggests social thinkers pay more attention to situations that are salient, vivid, and cognitively accessible. Although interpretative processes can be influenced by automatic cognitive filters (Broadbent, 1958), Cacioppo, Gardner, and Berntson (1997) suggested that ambivalence leads to a vigilant state of mind that scrutinizes the environment looking for different but related contextual cues. Ambivalence can thus prompt leaders and followers to expand their interpretative boundaries by incorporating a broader set of

interrelated salient and vivid situational signals that non-ambivalent individuals would otherwise dismiss.

Indeed, leaders' and followers' unique experiences, personalities, motivations, beliefs, and values can create biased lenses that guide their attention to specific cues and influence contextual interpretation. Hambrick and Mason (1984) proposed that leaders have restricted attentional resources, which imposes a limitation on their perception of events. The events that get a leader's attention are interpreted through a cognitive filter. For example, media reports that critiqued former CEO of Microsoft Steve Ballmer's decisions during his tenure argued that his background in marketing detracted from his ability to focus more broadly on pursuing technological advances (Rao, 2012). When leadership processes involve interpersonal interactions between leaders and followers who have conflicting options or perspectives, a one-sided view as was seen at Microsoft during Ballmer's tenure might not as readily occur.

Recent scholarship has focused on the notion of leadership as a social process of mutual influence among actors that are pursuing collective goals (Bass & Bass, 2008; Yukl, 2010). Leaders and followers can play active roles in interpreting contexts (Carsten, Uhl-Bien, West, Patera, & McGregor, 2010), accepting or rejecting influence (DeRue & Ashford, 2010), and directing attention to strategic issues (Dutton & Ashford, 1993). Accordingly, I posit that leader and follower ambivalent states can facilitate ongoing vigilance to a wide-range of stimuli by engaging in reciprocal problem solving and idea sharing. For example, researchers have found that argument quality is more effective when individuals are ambivalent, compared to when individuals are not ambivalent (Maio, Bell, & Esses, 1996). Maio and colleagues (1996) theorized that individuals experiencing ambivalence engage in systematic cognitive processes that consider interrelated information. It is plausible then that leaders and followers experiencing

ambivalence are able to sense, interpret, and discuss a broad set of issues derived from complex situations because their ambivalent cognitive states allow them to remain cognitively open and flexible.

Furthermore, in addition to expanding cognitive leader-follower interpretive boundaries, I propose that the interpersonal dynamics of ambivalence can deepen cognitive elaboration among leaders and followers. Specifically, I reason that because leaders and followers who experience ambivalence are each innately motivated to eliminate the psychological discomfort associated with the conflicting cognitions (van Harreveld et al., 2009), share mutual – often public – accountability to resolve the dilemma at hand, they are prompted to jointly search to accurately identify the source of their ambivalence. Kunda (1990) suggested accuracy goals can delay premature conclusions, leading individuals to process information more deeply and attend to relevant information more carefully. These goals are particularly important in complex situations given that dissimilar factors can overload cognitive resources, trigger speculative processes, or activate automatic biases. Thus, while individuals are generally cognitive misers, reluctant to expend their limited cognitive resources (Fiske & Taylor, 1984), I propose that accuracy-driven reasoning (Kunda, 1990) can enable leaders and followers to deepen their cognitive evaluations.

Different from ambivalence without an identifiable cause, ambivalence with an identifiable cause, which I argue is more likely to occur at the interpersonal level, activates focused deliberation about the key aspects of an individual's cognitive discomfort (Lavine et al., 2000). Knowing the cause of ambivalence enables individuals to integrate relevant information, dismiss incongruent cues, and avoid automatic reactions. Take for instance the case of a manager who favors her company's training programs over outsourced courses. Although outsourced courses have been shown to be more effective, internal training programs are shorter and more

efficient. Given the tight time constraints her department experiences, the manager does not feel like she can spare the additional work hours to send her employees to outsourced courses. She is ambivalent about this issue because she has both positive and negative evaluations. If she did not know the cause of her ambivalence, she would look for contextual cues to support her positive evaluations of the internal training program. Instead, because she more deeply considers the downsides of the internal training option, she is less susceptible to attention selection biases that could falsely convince her that the internal training option is more effective; she is able to override the heuristic responses that support only one perspective, and make an informed decision understanding the trade-offs involved.

Shared Ambivalence

I propose that shared ambivalence occurs when leaders and followers experience ambivalence about the same identifiable situation. Consistent with past research that has emphasized that individuals have the potential to share similar attitudes and beliefs (i.e., shared cognition theory, Cannon & Edmondson, 2001; shared reality, Hardin & Conley, 2001; Hardin & Higgins, 1996), “sharedness” exists when individuals hold overlapping understandings of task requirements, procedures, or role responsibilities (Thompson & Fine, 1999). Notably, shared cognitive states can influence group performance (Mathieu, Heffner, Goodwin, Cannon-Bowers, & Salas, 2005). Leaders and followers have the potential to develop a shared understanding of the situation through dynamic, reciprocal influence relationships. As such, they can experience and communicate their conflicting and opposite evaluations with each other, leading to leader-follower shared ambivalence.

Findings within the diversity literature can illustrate the concept of leader-follower shared ambivalence. Scholars have found that although individuals’ categorization of others as either

similar (i.e., ingroup) or dissimilar (i.e., outgroup) can facilitate or obstruct information flow, diversity can often lead to better outcomes by introducing differences in knowledge, expertise, and perspectives (van Knippenberg & Schippers, 2007). As such, diversity can lead to higher quality results for two primary reasons. First, different perspectives expand the option set from which individuals make decisions (Fleming, 2001; Hambrick, Cho, & Chen, 1996). Second, different evaluations of the same situation can create a positive tension that spurs leaders and followers to more deeply process more information (Horwitz & Horwitz, 2007; Shin, Kim, Lee, & Bian, 2012). In contrast, when leaders and followers hold the same evaluations, they come to an agreement with relatively little deliberation. Homogeneity in evaluations constrains the pool of options that leaders and followers jointly assess when interpreting the situation. In addition, they are not forced to confront or reconcile dissimilar perspectives, limiting the analytical depth created by positive tension. Leader-follower shared ambivalence occurs when both the leader and the follower hold conflicting evaluations about the same issue; consistent with the findings from the diversity literature, I posit that their resultant cognitive discomfort can trigger a positive tension to confront and reconcile the issue by using an expanded set of options.

I further theorize that shared ambivalence is generally characterized by leaders and followers who are still developing their attitudinal structures (Thompson, Zanna, & Griffin, 1995) and problem-related cognitive structures. As such, shared ambivalence provides the cognitive fluidity for leaders and followers to jointly expand their interpretative boundaries and deepen their analysis by integrating different task-relevant information. Cox, Pearce, and Perry (2003) posited that individuals, regardless of their formal roles within an organization, can laterally exchange information and influence others through a series of interpersonal interactions. Thus, leaders and followers alike can be attentive to multiple and conflicting situational cues, not

only partaking in the responsibility of decision-making but also challenging each other with different viewpoints (Hernandez et al., 2011).

For example, consider a general manager who is beginning to contemplate an expansion to a new region. As a first step, she meets with a financial manager to get more information about the costs and potential return of this expansion. They are especially apt to consider each other's views because the option set is still forming. The general manager starts the conversation by explaining her conflicting views about the new region: She foresees growth, but at a very high cost. The financial manager also has conflicting evaluations. Each of their analyses showed that the net present value could be negative or positive depending on the discount rate applied. When both share their conflicting opinions with each other, they expand the number of variables considered in their calculations and are forced to carefully think through their rationales. Their reciprocal interpersonal exchange aimed to resolve their shared ambivalent state prompts them to engage in joint contextual interpretation.

In the following sections I examine how leaders and followers can jointly interpret complex situations by adopting dynamic and socially construed leadership processes. In particular, I explain how situational complexity influences the interpersonal leader-follower dynamics of ambivalence in organizations. I focus on situationally-induced ambivalence and posit that complexity within this discrete context (Johns, 2006) can provide the necessary conditions to activate relatively different levels of leader-follower shared ambivalence. I then discuss how and when leaders' and followers' cognitive states can activate unique joint interpretative processes that vary in their level of deliberation and thus, create distinct decision-making pathways and outcomes (see Figure 1).

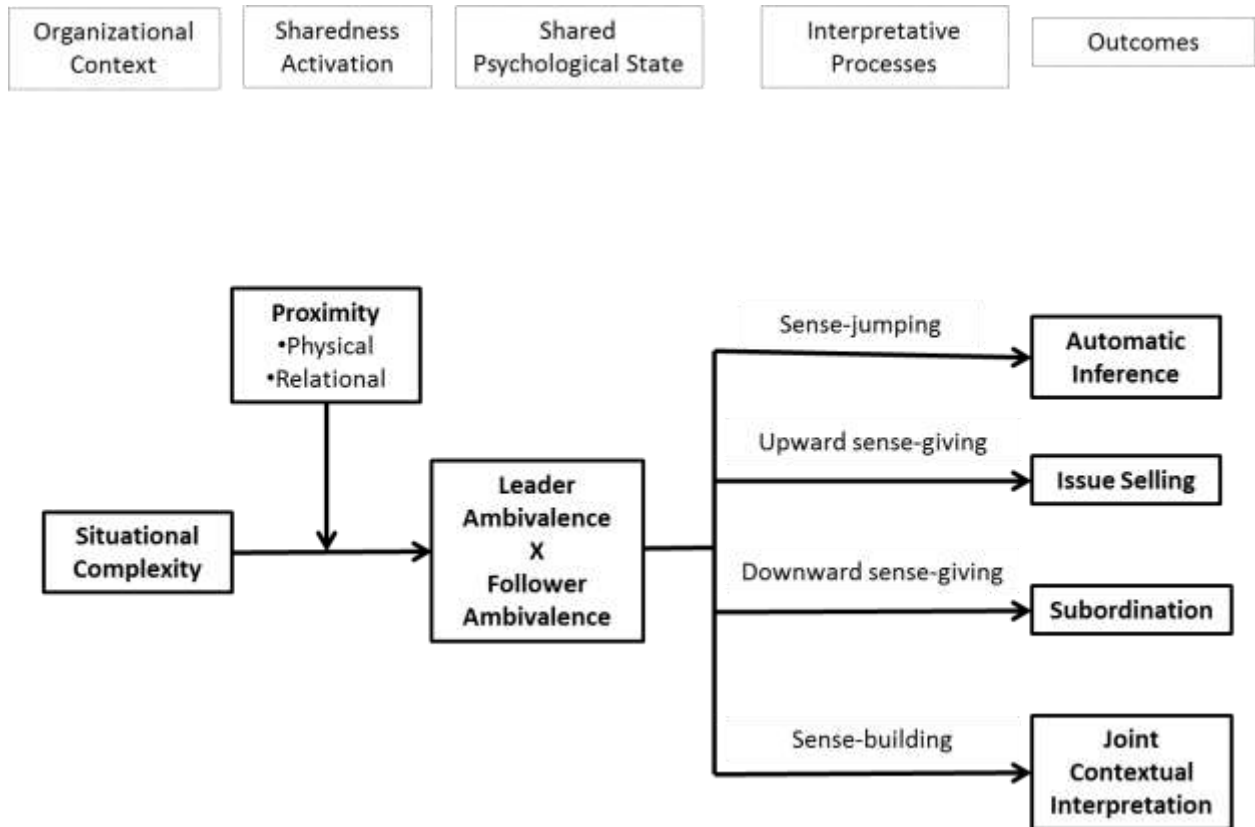


Figure 1: Theoretical Model for Chapter 1

Theoretical Model

The Influence of Situational Complexity on Ambivalence

To advance the current understanding of how situations influence ambivalence, I adopt Johns’ (2006) discrete context dimension. As such, I focus on “particular contextual variables or levers that shape behavior or attitudes” (p. 391). I explain how situational complexity can cause intrapersonal ambivalence because it involves (1) uncertainty about the options available within the environment and (2) specific cognitive challenges called “dualities,” defined as tensions between contradictory work demands (Johns, 2006).

Organizations face complex and dynamic environments (e.g. Buchko, 1994; Davis, Eisenhardt, & Bingham, 2009; Eisenhardt, 1989; Pisano, 1994). As complexity increases, so does uncertainty (e.g., Walters, Kroll, & Wright, 2010). Uncertainty affects everything from

individual information processing and decision-making (Vroom & Jago, 1988) to how organizations transact with their institutional environments (Oliver, 1991). A 2010 survey conducted by IBM showed that more than half of the 1,500 CEO's – spanning 60 countries and 33 industries – doubted their ability to manage escalating contextual complexity (Radjou, Prabhu, Kaipa, & Ahuia, 2010). Complex contexts have many and dissimilar factors (Duncan, 1972), which offer various relevant, salient, and vivid stimuli. This complexity can activate multiple and disparate goals within individuals. Thus, the uncertainty related to complex and dynamic contexts has the potential to trigger intrapersonal ambivalence.

Moreover, given the various contextual elements that individuals are exposed to on a daily basis, they often experience a number of dualities or tensions between two elements (Ford & Backoff, 1988): Collaboration-control (Sundaramurthy & Lewis, 2003), individual-collective (Murnighan & Conlon, 1991), flexibility-efficiency (Adler, Goldoftas, & Levine, 1999), exploration-exploitation (Smith & Tushman, 2005), and profit-social responsibility (Margolis & Walsh, 2003). These dualities demonstrate that employees are embedded in contradictory work demands, which have become increasingly more salient and persistent (Lewis, 2000). Quinn (1988) suggested that how leaders respond to these dualities is critical to the organization's fate. Consider the example of agency theory (Eisenhardt, 1985), which suggests that individuals try to maximize their short-term self-interests. In contrast, stewardship theory suggests that individuals see greater long-term utility in other-focused prosocial behavior (Hernandez, 2012). As organizations implement mechanisms to align agents' interests to principal's interests, considerations about short-term and long-term goals can trigger ambivalence in leaders and followers because of this duality. Accordingly, dualities not only foster competing goals (Denis, Langley, & Rouleau, 2007), but also create tensions between the individual and collective, and

between competing values, roles, and memberships (Pratt & Foreman, 2000). Dualities thus, have the potential to create intrapersonal ambivalence by drawing attention to opposite contextual features.

Specifically for leadership processes, leaders and followers are embedded in this complexity facing multiple dualities (Hoffman & Lord, 2013): (1) micro vs. macro-level; (2) static vs. dynamic; (3) familiar vs. novel; (4) extraordinary vs. ordinary; (5) positive vs. negative; (6) relevant vs. irrelevant; and (7) past vs. present vs. future. For instance, leaders' decisions can have a positive impact on the organizational performance, but negative impact on follower or group morale. This interplay between the influences of micro- and macro-level factors is a constant consideration of leaders (Hard, Tversky, & Lang, 2006). Similarly, leaders need to decide if the situation is static or dynamic. Static situations are usually viewed as finished and related to efficiency measures, whereas dynamic situations are continuously unfolding and related to effectiveness measures (Sonnentag, 2012). Finally, leaders need to decide if the situation is familiar or novel. Familiar situations are connected to the perceiver's memory-based event schemas, but novel events lack related schemas and require interpretation, sensemaking, and learning (Hoffman & Lord, 2013).

To summarize, complex situations have multiple and conflicting contextual factors that involve uncertainty and present cognitive challenges. These challenges are often described as dualities and have the potential to trigger intrapersonal ambivalence among leaders and followers. Consistent with these arguments, I propose the following:

Proposition 1. Situational complexity is positively related to intrapersonal ambivalence.

Granting situational complexity has the potential to activate intrapersonal ambivalence, I propose that leader-follower shared ambivalence (interpersonal) is enhanced by two factors:

Physical and relational proximity. Physical distance within the workplace can facilitate exposure to similar situational cues and relationship quality can determine the degree to which priorities are aligned. I now turn my attention to explore how and when physical and relational proximity can positively influence shared leader-follower interpersonal ambivalence.

The Moderating Role of Proximity in Influencing Leader-Follower Shared Ambivalence

Physical Proximity

Proximity in physical distance has been theorized in the organizational literature to describe how shared contextual and social factors influence individuals' attitudes, perceptions, values, cognitions, and behaviors (e.g., Rice & Aydin, 1991). For instance, Klein and Kozlowski (2000) suggested that homogeneous organizational contexts create shared attitudes and behaviors. As such, leaders and followers who work close to each other are more likely to experience similar contextual factors and share ambivalent cognitive states than if they were physically distant from each other.

Shared context exists when individuals have access to the similar information and share tools, work, and processes (Hinds & Mortensen, 2005), which facilitates mutual understanding of the situation (Fussell & Kreuz, 1998), and establishes common behavioral norms (Hinds & Bailey, 2003). Although leaders and followers do not share identical information, tools, work, and processes, the mere presence of similar contexts in an interdependent leadership process can increase the likelihood of being exposed to similar environmental stimuli and develop similar cognitive frameworks (Rumelhart & Ortony, 1977). In complex contexts, physical proximity becomes an important factor in facilitating leader-follower shared ambivalence. Leaders and followers who do not share the same context can focus on different stimuli, which can guide their attention to non-related cues.

Proposition 2. The relationship between situational complexity and leader-follower shared ambivalence is moderated by physical proximity. Physical proximity between the leader and follower is likely to enhance leader-follower shared ambivalence.

Relational Proximity

Leader and follower relational proximity is based on social exchange and characterized by loyalty, commitment, support, and trust (Cropanzano & Mitchell, 2005; Uhl-Bien & Maslyn, 2003). Fairhurst (1993) found that high-quality relationships predicted open discourse about non-routine problems, more joint decision making, and lower perceptions of power distance. Thus, leaders and followers who enjoy high-quality relationships spend time sharing information safely about complex situations. Indeed, Sias (2005) found that amount and quality of exchanged information is positively correlated with leader-follower relationship quality.

Past work on relational proximity also suggests that leaders and followers process resources and information as they interact (Dow, 1988), and this processing facilitates the construction of shared goals and attitudes. Relational models of social influence suggest that "people are most likely to compare with and come to agree with others to whom they are more strongly tied" (Erickson, 1988, p. 115). Therefore, in complex situations, the quality of the relationship between leaders and followers facilitates communication about identification, alignment, and prioritization of issues. Relational proximity is thus, positively related to shared leader-follower ambivalence. Based on this rationale, I propose the following:

Proposition 3. The relationship between situational complexity and leader-follower shared ambivalence is moderated by relational proximity. Relational proximity between the leader and follower is likely to enhance leader-follower shared ambivalence.

Outcomes of Leader-Follower Interpersonal Ambivalence

To deepen the theorizing on how ambivalence unfolds within the leader-follower relationship, I expound on the cognitive dynamics that occur at relatively high and low levels of leader and follower ambivalence. A key assumption in this Chapter is that leaders and followers experience ambivalence about *identifiable* contextual events. Contextual knowledge is acquired as a result of where leaders and followers are situated rather than what they do (Sole & Edmondson, 2002). As such, I build on intrapersonal ambivalence to propose an isomorphic effect on interpersonal interactions (Chan, 1998): Leaders and followers together optimize the use of their limited cognitive resources by *expanding* their cognitive interpretative boundaries and *deepening* their cognitive evaluations to resolve their contrasting evaluative orientations.

I propose four types of cognitive processes that result from relatively different levels of leader and follower ambivalence. In situations in which leader and follower both experience relatively low levels of ambivalence, sense-jumping can result in automatic inferences. Circumstances in which ambivalence is relatively high for the leader and relatively low for the follower can result in upward sense-giving characterized by issue selling. Situations in which ambivalence is relatively low for the leader but relatively high for the follower are characterized by downward sense-giving resulting in follower subordination. Finally, situations in which leader and follower both experience relatively high levels of ambivalence, sense-building can result in joint contextual interpretation (see Figure 1). It is important to note that these four cognitive processes are not intended to be exhaustive, and the experience of each type can be dynamic and evolving within the dyad. Later, I describe how time availability, decision frequency, and expertise can function as boundary conditions for these cognitive processes.

Automatic Inference

Scholars have demonstrated that individuals automatically evaluate features of the environment on a continual basis (Bargh, 1990; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001). These automatic evaluations also influence decision-makers (Dutton & Ashford, 1993). Indeed, individuals tend to use ready-made cognitive categories to reduce the amount of cognitive resources applied in contextual interpretation (Gioia & Poole, 1984). According to Weick (1979), contextual interpretation follows a recipe. “Expectancies that have evolved out of frequent and consistent experience with specific environmental domains” (Bargh, 1982, p. 426) activate automatic inferences and pull individuals away from deliberative thinking. Langer (1989) showed that individuals execute tasks mindlessly or in automatic ways. Therefore, when individuals do not identify the need to engage in cognitive elaboration, they will suspend the search for additional information and preserve their scarce cognitive resources.

I propose that leaders and followers who experience relatively low levels of ambivalence will *not* expand their contextual search, but instead will automatically jump to conclusions before engaging in cognitive elaboration. Janis (1982) suggested that an individual’s commitment to his or her initial preferences precludes systematic and extensive consideration of the information. In complex situations, these individuals will engage in sense-jumping processes and make automatic inferences. Research on group decision making provides some preliminary support for this proposition. Stasser and colleagues demonstrated that individuals spend most of their time discussing shared information (Stasser & Titus, 1985); yet, discussing new unshared information improves the decision quality (Stasser & Stewart, 1992).

Research on social comparison (Festinger, 1957) suggests that individuals look for agreement as a source of validation when the situation is complex. Indeed, “an opinion, a belief, an attitude is ‘correct,’ ‘valid,’ and ‘proper’ to the extent that it is anchored in a group of people

with similar beliefs, opinions, and attitudes” (Festinger, 1957, p. 272). In complex situations, groups tend to achieve consensus (Stasser & Stewart, 1992). Therefore, leaders and followers with low levels of ambivalence (i.e., highly committed to one side) will engage in brief conversations about information that is already shared and quickly jump to conclusions without deliberating about key interdependent issues.

I can consider the case of an organization undergoing a departmental merger in which a top manager (leader) works with a middle manager (follower) to develop a compensation system for a new integrated marketing division. Their goal is to find synergies in the existing compensation systems across departments to create a new plan that increases efficiency *and* satisfaction levels. In this example, the leader and follower had positive experiences with their own compensation system that integrates salary and variable pay. Not seeing the need to evaluate additional options, they recommend the implementation of their system to the new integrated marketing division. They engaged in sense-jumping processes. This is problematic because a subsequent analysis demonstrated that one of the original departments has an incompatible operational system and social norms that might present serious difficulties for integration. Consistent with my theoretical reasoning, I propose:

Proposition 4: When leader and follower experience relatively low levels of ambivalence, they are likely to engage in sense-jumping processes that result in automatic contextual inferences.

Issue Selling

Individuals’ efforts to shape the attention of others are contextually situated (Goffman, 1981; Ocasio, 1997). Dutton and Ashford (1993) proposed that issue characteristics, seller characteristics, and their interaction in a social context can make some claims more viable than

others. They suggested that followers tend to engage in issue selling efforts when they can identify solutions for the problem. Similar to impression management, issue selling represents a personal risk (Dutton & Ashford, 1993). Because followers are trying to build credibility, which is often associated with argument consistency (Goffman, 1981), they are not likely to experience ambivalence when engaging in issue selling efforts.

I propose that upward sense-giving exists in situations in which followers engage in contextual translation for leaders. These efforts present a certain measure of vulnerability for the leader in that followers can significantly influence leaders' cognitive elaboration and interpretation. Leaders experiencing relatively high ambivalence look for ways to reduce their cognitive discomfort. Indeed, researchers have suggested that ambivalent individuals are susceptible to social influence (Schopler, Insko, Graetz, Drigotas, Smith, & Dahl, 1993) and less resistant to persuasion (Eagly & Chaiken, 1995). The interactive nature of contemporary leadership theories suggests that followers can play a key role in providing information and interpreting the context. Follower influence can involve, for example, the successful generation and mobilization of resources around new ideas (Burgelman, 1983). Thus, followers can represent credible sources of contextual interpretation that minimizes the need for leaders to deepen their evaluations. Indeed, a leader's cognitive elaboration can be focused on information provided by the follower. Because leaders and followers have a common purpose of accomplishing collective goals, leaders experiencing relatively high ambivalence could potentially interpret followers' agenda as beneficial to the organization.

If we return to the case of the departmental merger, we can picture a situation in which being exposed to the merger negotiation created relatively more mixed evaluations for the leader than the follower. The leader believes that maintaining the current compensation system might

keep one department satisfied, but might pose problems because it violates the social norms of the other department. The follower, however, cares much less about the other department and thus, experiences a relatively lower level of ambivalence as compared to the leader. The follower then proceeds to construct arguments to guide the leader toward a particular outcome. The following proposition reflects this reasoning:

Proposition 5: When the leader experiences relatively higher levels of ambivalence in comparison to the follower, the follower is likely to engage in upward sense-giving processes that result in issue selling efforts.

Subordination

Leaders actively engage in contextual translational efforts (House, 1996) to give sense or interpret the context for followers. Followers experiencing relatively high ambivalence look for explanations of the context in an attempt to minimize their cognitive discomfort. As such, they are highly vulnerable to leaders' interpretations of complex contexts. Because complex contexts call for leaders and followers to interpret new information that can be highly ambiguous, leaders who have already made sense of the context will present information that supports their interpretation (Pfeffer, 1981). In such complex situations, followers are likely to activate their social schema of subordination and be largely ineffectual (Carsten et al., 2010). Since subordination is a social schema that is highly accessible to followers (Uhl-Bien & Pillai, 2007), I posit that the threshold of ambivalence for downward influence is lower than the threshold of ambivalence for upward influence. Followers experiencing relatively high ambivalence thus, (1) avoid cognitive deliberation, or (2) engage in deliberation that is based on leaders' perspective. Although their cognitive boundaries are broadened by the leaders' interpretations, they are likely

to passively accept the leader's view. A tendency to limit their cognitive inquiry to the information provided by the leader can also limit followers' analytical depth.

Returning to the earlier example of the compensation plan, the leader could have participated in the initial merger negotiations, analyzed the potential operational systems, and recognized cultural differences across departments. Although still biased by his cognitive limitations, these investigative activities allowed the leader to conclude that his own compensation system should be recommended to the new integrated marketing division. In this situation, the follower might have mixed evaluations. The follower thinks the leader's recommended system is fast and easy to understand, but unfair to top performers because of the negligible difference in pay between high and low performers. The follower is in a highly ambivalent cognitive state and conforms to his subordinate role by not questioning the leader's decision. Thus, I propose the following:

Proposition 6: When the follower experiences relatively higher levels of ambivalence in comparison to the leader, the leader is likely to engage in downward sense-giving processes that result in subordination.

Joint Contextual Interpretation

Researchers have suggested that the cognitive fluidity caused by ambivalence can motivate reality sharing processes (Festinger, 1950; Hardin & Higgins, 1996). Leaders and followers who experience psychological discomfort with a common identifiable cause focus their cognitive resources to jointly interpret the context. Similar to individuals who focus their cognitive resources to understand the source of their discomfort, leaders and followers experiencing ambivalence will engage in a contextual search to jointly eliminate their discomfort. In so doing, they protect their cognitive resources from distractions and channel their

resources. Because leaders and follower likely have different experiences, values, and beliefs, their joint interpretation covers key issues that they could not foresee individually. Thus, I propose that when leaders and followers experience relatively high levels of ambivalence they will seek to mutually minimize their cognitive discomfort, prompting them to engage in a process of collaborative contextual interpretation that expands their interpretative boundaries.

Furthermore, I posit that leaders and followers who experience relatively high levels of ambivalence are less likely to be influenced by hierarchical structures that minimize the effects of social schemas in the contextual interpretational effort. Research on social schemas suggests that simply assigning someone the role of “follower” invokes a cognitive schema that aligns with the notion that leaders have more knowledge and accountability than followers (Konst & van Breukelen, 2005) and that followers should be deferent and obedient (Gerber, 1988). These findings suggest that followers’ behaviors are automatically activated by simple cues in the environment. Ambivalence, however, can trigger a focused deliberative cognitive process that prompts the leader and follower to deepen their cognitive evaluations. Leaders who experience ambivalence signal to followers that collaboration is valuable. In an effort to decrease their discomfort, leaders lessen formal role boundaries (DeRue & Ashford, 2010), encouraging followers’ contributions to the contextual interpretation.

In the departmental merger example, the leader and follower can have strong mixed evaluations about the selected new system. The follower sees the system as fast and easy to understand, but unfair to top performers because of the negligible pay differential. The leader views the system as beneficial for current employees but detrimental for new sales representatives. In this case, they focus their cognitive resources on their task (rather than persuasion) and are able to more deeply process the positive and negative features of the selected

new system. Conflicts are expected, yet both parties constructively engage in sense-building to minimize psychological discomfort. In the end, they expand their contextual search to include additional options and become less vulnerable to implicit norms that govern their formal roles. The leader and follower jointly explore the benefits and pitfalls of the selected new system and further explore possible synergies between the old and new system. Therefore, I propose the following:

Proposition 7: When leader and follower experience relatively high levels of ambivalence, they are likely to engage in sense-building processes that result in joint contextual interpretations.

In sum, relative leader and follower ambivalence levels can lead to distinct cognitive processes that can create more or less collaborative contextual interpretation strategies. These strategies explain how leaders and followers engage in evaluations to resolve their shared ambivalent states.

Boundary Conditions to the Effect of Ambivalence in Leadership Processes

Although these cognitive processes are activated by situational complexity and enhanced by physical and relational proximity between leaders and followers, I propose that their effects can be constrained by opportunity (time availability and decision frequency) and legitimacy (expertise) factors. Next, I explain how time availability, decision frequency, and expertise can act as boundary conditions to interpretative processes.

The Role of Time Availability in Ambivalence and Leadership Processes

The lack of a deadline can give leaders and followers the opportunity to postpone their decisions. Indeed, Luce, Bettman, and Payne, (1997) suggested that when facing a difficult decision, people turn to procrastination as the first coping strategy; only when the decision

cannot be avoided does problem-focused coping come into play. Similarly, in their model of ambivalence-induced discomfort, van Harreveld and colleagues (2009) suggested that procrastination is the primary choice for individuals experiencing ambivalence to reduce the unpleasant feelings associated with ambivalent choice. This is in line with Hanze's (2001) finding showing that individuals experiencing ambivalence tend to avoid the decision.

Accordingly, I posit that individuals, who do not have to make a decision within any time-bound constraints, avoid expanding their cognitive boundaries.

Take for example a legal firm considering a new recruiting strategy. A partner at the firm proposes a public referral incentive to disseminate career opportunities within the firm. However, the HR director of the firm is ambivalent about this initiative. Although it can save time, it can also create accusations of bias or favoritism in hiring decisions. The HR director does not have to make a decision until the beginning of the hiring cycle, which happens in six months and thus, he postpones the decision.

In contrast to instances where no deadline exists, tight time deadlines in dynamic and complex contexts can limit the ability for individuals to engage in extensive trial-and-error processes, such as prototyping new innovations. Moreover, it is often the case in these types of environments that opportunities have limited time windows in which they are even available (D'Aveni, 1994). Such situations require quick evaluations, which can limit the effects of ambivalence on the decision. In particular, I posit that leaders and followers will have little time for idea incubation or suspension of judgment, and may be more likely to make decisions based on a limited set of options and rely heavily on prior experiences.

Returning to the public referral incentive program, let's assume that the managing partner of the firm demanded a new recruiting strategy from the HR director to adjust to fast market

growth, giving the director one week to design a proposal. In this scenario, although the HR director might be experiencing ambivalence about the public referral incentive, he does not have time to expand his search to incorporate different options. He relies instead on the one option presented to him and consequently recommends the new program. Based on this rationale I propose the following:

Proposition 8: Time availability (i.e., unlimited or inadequate time) can diminish the relationship between leader-follower shared cognitive states and interpretative outcomes.

The Role of Decision Frequency in Ambivalence and Leadership Processes

Another likely boundary condition for the effects of shared ambivalence on cognitive interpretation outcomes is decision frequency. Leaders and followers who engage in multiple decisions can develop routines and norms that are commonly accepted. Such common practices can create strong situations (Mischel, 1977), which augment the effects of shared cognitive states on interpretative processes by producing highly salient and uniform expectations. Strong situations function as organizational climates, which can influence the course of action individuals take within the organization (Schneider, Salvaggio, & Subirats, 2002). Specifically, strong climates accentuate climate-relevant practices, whereas weak climates attenuate those practices. Building on this rationale, I propose that leaders and followers who routinely engage in multiple decisions can create a climate that encourages the expansion of interpretative boundaries and careful evaluation of options.

Proposition 9: Decision frequency can accentuate the effects of leader-follower shared cognitive states and interpretative outcomes.

The Role of Expertise in Ambivalence and Leadership Processes

I propose that a third boundary condition is expertise. Expertise is defined as the sophistication of a problem-related cognitive structure held by an individual (Chi, Glaser, & Rees, 1982; Larkin, McDermott, Simon, & Simon, 1980). Previous research has found that experts differ from nonexperts in many respects such as memory, solution paths, and solution speed (Ericsson, 2003). Experts tend to see the challenge as more analyzable and less variable than non-experts (Haerem & Rau, 2007). Finally, expertise increases a member's influence on team decisions (Locke, Alavi, & Wagner, 1997) and on nonexpert interpretations (Yukl & Falbe, 1991). Therefore, experts have specific cognitive structures that affect their level of legitimacy (Sagarin, Cialdini, Rice, & Serna, 2002), which, in turn, increases their power to influence others (French & Raven, 1959).

In their elaboration likelihood model of persuasion (ELM), Petty and Cacioppo (1986) suggested that people initially evaluate a situation based on its ease of comprehension and personal relevance. If the message is difficult to comprehend (e.g., the situation is complex) or of high personal relevance (e.g., engaged leader or follower), the evaluator will look to peripheral cues (e.g., the expertise of close others) as sources of information (Petty, Cacioppo, & Goldman, 1981). In complex situations, leader or follower expertise can provide the legitimacy to change the strength of the effects of ambivalence on cognitive processes. In complex contexts, leaders or followers might, therefore, look to their expert counterpart as a credible source of information, minimizing the need for deliberation.

Taken together, irrespective of their own cognitive state, an expert leader or follower will have a strong influence over an ambivalent individual for at least two reasons. First, experts have more developed explanations for the situation, which are more likely to persuade individuals experiencing a fluid cognitive state. In the ambivalent counterpart's view, the expert has already

expanded the interpretative boundaries. Second, experts are perceived as credible sources of information who have deeply thought about the situation, which increases the willingness of others to accept information provided by the expert. Accordingly, I propose the following:

Proposition 10: Expertise can diminish the relationship between leader-follower shared cognitive states and interpretative outcomes.

Discussion

This Chapter advances the present state of ambivalence theory by examining the interpersonal dynamics of ambivalence in leadership processes. In particular, I proposed a framework that explains how and when situational complexity can activate leader-follower shared ambivalence. I also theorized about four different interpretative processes that can result from leader-follower shared ambivalence states: Automatic inference, issue selling, subordination, and joint contextual interpretation. In particular, I posited that relatively high levels of leader-follower shared ambivalence can have functional outcomes for leadership processes. Finally, I proposed several boundary conditions that can influence the relationship between leader-follower shared cognitive states and interpretative outcomes. The theory of leader-follower shared ambivalence in complex situations offers important implications for both organizational theory and practice.

Theoretical Contributions

I situate the conceptual model within complex contexts that can induce ambivalence in leadership processes. Specifically, my examination has explicated how and when situationally induced leader-follower shared ambivalence can lead to functional outcomes. As such, I contribute to shared cognition theory (Cannon & Edmondson, 2001) by expanding its tenets to leadership processes. Drawing from a foundation of intrapersonal ambivalence with identifiable

causes, and theorizing that shared states can be activated by physical and relational proximity, I posited that leader-follower shared ambivalence can facilitate the cognitive expansion of interpretative boundaries and cognitive depth in evaluations. This process results in a type of joint contextual interpretation propelled by sense-building efforts.

In addition, this model complements existing research that has primarily examined sense-making in organizations (i.e., Weick, 1995; Weick, Sutcliffe, & Obstfeld, 2005) by shedding light on the various interpretative processes in which leaders and followers can engage when embedded in complex contexts. Based on different combinations of relative levels of shared ambivalent states, leaders and followers participate in sense-jumping, upward sense-giving, downward sense-giving, and sense-building. These different interpretative processes can lead to more or less functional outcomes based on the degree of deliberation. Although I have identified three boundary conditions for these processes, future scholars should broaden this focus to investigate if individual differences like need for closure (Webster & Kruglanski, 1994) or openness to new experiences (McCrae & Costa, 1997) and motivational variables (e.g., epistemic motivation; De Dreu, Nijstad, & Van Knippenberg, 2008) can also influence the relationship between leader-follower shared ambivalence on interpretative processes.

Future scholars should also investigate if goal shielding strategies (Fishbach & Shah, 2006) are applied when leaders and followers engage in sense-building efforts. Fishbach and Shah (2006) found that individuals who hold a clear goal (i.e., accurately identifying the cause of their cognitive conflict) have a tendency to not only approach the focal goal but also avoid hindering temptations. Goals that individuals are fully committed to are prioritized; they are shielded from interference, so that the greater an individual's commitment toward a goal, the greater the inhibition of alternative goals (Shah & Kruglanski, 2002). Goal shielding, therefore,

can supply cognitive resources for expanding cognitive boundaries and deepening cognitive elaborations.

Furthermore, this Chapter offers important contributions to understanding how and when followers actively influence their leader's decisions. Past work on issue selling has suggested that followers (sellers) tend to be conservative in their issue selling efforts (Dutton, Ashford, O'Neill, & Lawrence, 2001). Evidence has shown that followers who package the issue using existing business logic and continuously push issues in incremental efforts are more successful (Dutton et al., 2001) than followers who adopt more disruptive or radical strategies. In addition, issue selling is a highly political and commitment-building process that requires a deep knowledge of "how the system works" (Dutton et al., 2001, p. 730); it is shaped by a "seller's sense of the timing of such efforts" (Dutton et al., 2001, p. 730). These past findings suggest that issue selling success is a function of issue characteristics, follower personal interests, and leader readiness. I advance the current understanding of issue selling theory by clarifying when issue selling could be most successful; that is, when the leader experiences high ambivalence relative to the follower. Because followers are concerned about their own perceived credibility, they tend to engage in issue selling when they are certain about the outcomes of their initiatives. However, I have theorized that leaders are generally more open to issue selling efforts when they experience relatively high ambivalence. Dutton and Ashford (1993) suggested that uncertainty can drive the attention of top management. Leaders experiencing relatively high ambivalence are unsure about the complexity of the issue, making them easily swayed by follower influence.

Moreover, although leadership has become a social interaction process in which individuals engage in repeated leading-following interactions and co-construct identities and relationships (e.g., DeRue, 2011), leaders and followers remain constrained by their own

cognitive biases. My examination of leader-follower shared ambivalence has important implications to both the identity construction process and the ease with which roles are interchanged. Specifically, leader-follower shared ambivalence can create a cognitive state that facilitates identity de-construction: As leaders and followers engage in a process of claiming and granting identities over time (DeRue & Ashford, 2010), their experience of ambivalence can shape and reshape their roles. This process of moving toward and away from formally assigned roles can expand individuals' self-definitions (Gardner, Gabriel, & Hochschild, 2002). Future scholars should explore if leader-follower shared ambivalence can provide the cognitive foundation to ambivalent identities (Pratt & Doucet, 2000; Sluss & Ashforth, 2007).

More broadly, I contribute to the current understanding of strategic leadership (Boal & Hooijberg, 2001) by explaining how different contextual interpretative processes can inform strategy development. Strategic leadership theorists have proposed that top management is responsible for strategy formulation and implementation (Boal & Schultz, 2007; Makri & Scandura, 2010) and that such strategic choices are in part predicted by top leaders' background characteristics (e.g., values and personality; see Chatterjee & Hambrick, 2007; Finkelstein, Hambrick, & Cannella, 2008). I theorized that leader-follower shared ambivalence is likely to lead to a process of collaborative contextual interpretation that expands interpretative boundaries and lessens formal role boundaries. As such, I offer a cognitive explanation for how top leaders might successfully overcome their individual cognitive limitations when integrating conflicting information to develop new strategies. Future research should investigate how leader-follower shared ambivalence can influence strategy development and implementation across different levels in organizations.

Finally, given the central position of leader-follower shared ambivalence to interpretative processes, the proposed theory contributes to the field of organizational learning. More specifically, leader-follower shared ambivalence can facilitate double-loop learning (Argyris, 1976). According to Argyris and Schon (1978) learning involves the detection and correction of error. Different from single-loop learning, which involves taking for granted goals, frameworks, and strategies, double-loop learning “involves questioning the role of the framing and learning systems that underlie actual goals and strategies” (Usher & Bryant, 1989, p. 87). Leader-follower shared ambivalence can facilitate the necessary inquiry to expand error detection and modify the existing organizational norms, policies, and objectives. As leaders and followers who experience ambivalence not only expand their cognitive boundaries, but also engage in cognitive elaboration, they tend to incorporate a broad array of issues into their analyses and question existing practices. Future research should investigate if leaders and followers who experience ambivalence are also more likely to engage in double-loop learning.

Practical Implications

Given individuals’ cognitive limitations to cope with increasingly complex organizational environments and thus, the enormous potential for ambivalent states, organizations should implement formal structures that facilitate collaborative contextual interpretation. For instance, recent work on empowering leadership (Lorinkova, Pearsall, & Sims, 2013) has demonstrated that empowering leaders emphasize idea exchange and participative decision-making climates. These leaders focus on learning and positive team member interactions. The results of this collaborative type of leadership indicates that empowered teams tend to achieve high performance over time because they use behavioral routines and shared cognitions developed during their initial interactions (Kozlowski, Gully, Nason, & Smith, 1999). This research

highlights the need for leaders to involve followers in contextual interpretation and decision-making.

Similarly, the theory of leader-follower shared ambivalence presented here suggests that leaders and followers achieve joint contextual interpretation when they share relatively high levels of ambivalence. Organizations should thus, embrace the proactive role of followers and encourage constructive cognitive conflicts. For instance, organizations looking for ways to increase ambivalence should invest in opportunities for idea incubation, encourage within- and across-department debates, and cultivate counterfactual thinking through formal debriefing routines. More generally, creating the organizational structures that provide opportunities for leader-follower shared ambivalence to emerge can help leaders and followers refine their analytical skills. These opportunities can speed up employees' development and facilitate talent identification. Organizations seeking to adopt structures that encourage leader-follower shared ambivalence, therefore, will likely have a broader and deeper pool of talent to choose from for future leadership positions than organizations that ineffectually manage their members' ambivalent states.

Conclusion

Although leaders and followers are constantly interpreting and reinterpreting complex, often conflicting issues within organizations, scholars have yet to identify how this process unfolds jointly within leader-follower dyadic interactions. In this Chapter I have explored a specific shared cognitive state – leader-follower shared ambivalence – and outlined its consequent interpretative processes and outcomes. I have put forth a model of leader-follower shared ambivalence to build theory on when and how leaders and followers collaboratively

interpret the context. In so doing, I shed light on how ambivalence can trigger functional leadership processes that allow leaders and followers to build sense out of situational complexity.

In Chapter 2, I focus on the individual level of analysis and propose an intrapsychological model of identified ambivalence. Drawing on social cognition theory, I propose that individuals who identify the causes of their ambivalence engage in deeper cognitive processes, which in turn, facilitates their ability to make effective decisions.

Chapter 2 - Identified Ambivalence: Overcoming Structural and Cognitive Evaluative Problems

Abstract

In this chapter, I investigate the functional effects of ambivalence on decision-making processes at the individual level of analysis. I build on social cognition theory to propose that individuals who can identify the causes of their ambivalence engage in cognitive processes that counteract the well-documented adverse coping and defensive mechanisms associated with the dysfunctional outcomes of ambivalence. Specifically, results demonstrate that individuals who identify the sources of their ambivalent states are less likely to be influenced by cognitive biases (Studies 1 and 2). I also find that the mechanisms through which this effect can occur are contextual and moral awareness (Study 3). Finally, I investigate the role of trait self-control and perceptual moral attentiveness as specific contingencies in the conceptual model. Results suggest that when individuals lack trait self-control or moral attentiveness, the effect of their identified ambivalence on their contextual and moral awareness, respectively, is enhanced, which in turn predicts their ability to make effective decisions (Study 4). Taken together, I advance an intrapsychological model and offer robust, consistent empirical evidence that explains why, how, and when ambivalence can result in functional outcomes.

Introduction

Ambivalence, defined as a psychological state caused by holding strong contrasting evaluative orientations toward an object or situation (Baek, 2010; Priester & Petty, 2001), has become a common phenomenon in the organizational context (e.g., Gilbert, 2006; Plambeck & Weber, 2009) with contextual and moral consequences (Molinsky & Marlolis, 2004; Segal & Lehrer, 2013; Vadera & Pratt, 2013). Although ambivalence has been theorized to produce functional outcomes (e.g., Ashforth, Rogers, Pratt, & Pradies, 2014), the majority of past literature has focused on its dysfunctional outcomes caused by adverse coping (i.e., conscious and intentional protective behavior; Lazarrus & Folkman, 1984) and defensive (i.e., unconscious and unintentional protective behavior; Cramer, 1998) mechanisms. Scholars have suggested that individuals experiencing ambivalence usually avoid dealing with its associated psychological discomfort (Cacioppo, Gardner & Berntson, 1997) by making quick decisions (Conner & Armitage, 1998) based on speculative thinking (Haidt, 2001). As I argued in Chapter 1, the tendency to engage in this sort of heuristic processing can be problematic, especially in complex contexts. In particular, researchers have shown that cognitive automaticity in complex contexts can have negative social and moral repercussions (Gino, Schweitzer, Mead, & Ariely, 2011). Drawing from social cognition theory, I propose that individuals can curtail their counterproductive automatic responses by engaging in deeper cognitive processing to explore the causes of their ambivalence, such as relevant contextual and moral cues, and therefore, make more effective decisions.¹

Social cognition theorists have emphasized that social thinkers pay more attention to information that is salient, vivid, and cognitively accessible (Fiske & Taylor, 1984). Decision

¹ We define effective decisions as decisions that are not influenced by automatic responses to cognitive biases.

makers, then, can detect and encode contextual and moral cues differently based on the perceived relevance of the incoming information. Nevertheless, individuals tend to assign new contextual and moral information to categories that are easy to process (Fiske & Taylor, 1984; Reynolds, 2009), especially when they have limited cognitive resources to encode cues and process information (Baars, 1997; Simon, 1979; Wilson, 2004), and when they are vulnerable to cognitive biases that can inform perceptions and decisions (Kahneman, 2011). These cognitive limitations, thus, can distort individuals' identification and interpretation of relevant contextual and moral cues as they apply to decision-making processes.

Consistent with social cognition theory, I propose that when individuals cannot readily identify the causes of their ambivalence, irrelevant contextual information becomes salient, vivid, cognitively accessible, and is used as coping or defensive mechanisms to alleviate their cognitive discomfort by impulsively settling the conflict (Lazarus & Folkman 1984). Conversely, individuals who identify the source of their ambivalence (hereafter, referred to as identified ambivalence) pay attention to *relevant* contrasting contextual and moral cues. In so doing, they engage their limited cognitive resources to investigate the proper causes of the conflict, while suppressing their attention toward possible distractions (i.e., goal-shielding; Shah & Kruglanski, 2002). Thus, individuals deliberately process interrelated positive and negative cues more thoroughly, minimizing the use of heuristics when making decisions and maximizing their awareness of the context and the impact of their decisions on possible stakeholders.

As demonstrated by previous research on the more general body of work associated with individual awareness, an individual's conscious registration of contextual cues (Brown, Ryan, & Creswell, 2007) influences effective decision making across a broad range of complex and dynamic situations (e.g., Blandford & Wong, 2004; Schulz, Endsley, Kochs, Gleb, & Wagner,

2013). Past findings have also established that awareness is a key component of ethical decision making (Reynolds, 2008; Trevino, 1986). However, contextual and moral issues are processed by distinct cognitive structures (Reynolds, 2006, 2008); neuroimaging studies have provided evidence that moral cognition is separate from other forms of cognitive and decision-making processes (Salvador & Folger, 2009; Levy, 2008). Since decisions can have social and moral repercussions (Donaldson & Preston, 1995), I propose that contextual and moral awareness can represent distinct pathways to accounting for the effect that identified ambivalence can have on effective decision making.

Given the importance of stable individual characteristics in perceiving and encoding the social context, I also investigate how trait self-control (Tangney, Baumeister, & Boone, 2004) and perceptual moral attentiveness (Reynolds, 2008) can accentuate or attenuate the role played by ambivalence in the activation of contextual and moral awareness, respectively, and, ultimately, decision effectiveness. I argue that when individuals lack general preferences to control impulses or identify moral issues, identified ambivalence can influence their levels of contextual and moral awareness by minimizing automatic responses to contextual and moral cues. Indeed, decisions and behaviors are influenced by a complex interaction of cognitive states, traits, and situations (Michel & Shoda, 1995). Accordingly, I build toward a first stage mediated moderation model that examines how the interactions between identified ambivalence with trait self-control and perceptual moral attentiveness influence decision effectiveness through contextual and moral awareness, respectively.

In the following sections, I first present an overview of the literature on ambivalence to explore its underlying assumptions. I then explain the theoretical framework I adopted in this chapter. Next, I explain how individuals who identify the causes of their ambivalence can

counteract adverse coping and defensive mechanisms, resulting in more effective decisions. I elaborate on the causal mechanisms (contextual awareness and moral awareness) through which effective decision making is created and propose factors (trait self-control and perceptual moral attentiveness) that can accentuate or attenuate these pathways (see Figure 2). Across four studies, I show consistent, robust evidence for the proposed model. I conclude by discussing the implications of my findings for both advancing theory and practice.

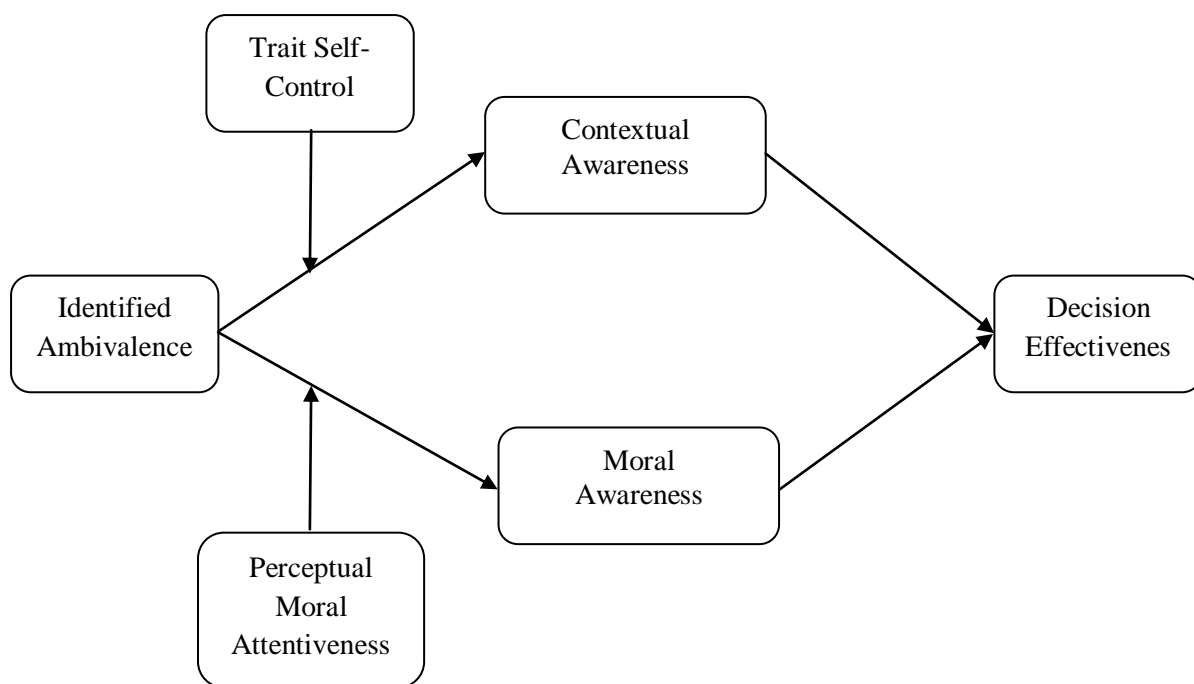


Figure 2: Conceptual Model for Chapter 2
Exploring the Construct of Ambivalence

Attitudinal Ambivalence

Existing research on attitudinal ambivalence has traditionally been built on Allport's (1935) seminal work on attitudes. Allport (1935) posited that unidimensional bipolar models poorly represent the complexity of individual's attitudes. Consistent with neurophysiological

evidence, which has demonstrated that negative and positive evaluations are independently processed by specific parts of the brain (e.g. Ahern & Schwartz, 1985; Damasio, 1994; Delgado, Roberts, & Miller, 1954; Olds & Milner, 1954), conflicting attitudes can be co-activated leading to an ambivalent state.

Past research on ambivalence has focused on two types of ambivalence: potential and felt ambivalence. Potential ambivalence (e.g., Cacioppo, Gardner & Berntson, 1997; Kaplan, 1972; Thompson, Zanna & Griffin, 1995) refers to the coexistence of evaluative incongruent beliefs and opinions about which the attitude holder is not necessarily aware, whereas felt ambivalence (e.g., Jamieson, 1993; Priester & Petty, 1996) refers to psychological conflict that results from the presumed awareness of strong incongruent beliefs and opinions. With either type of ambivalence, individuals often try to minimize the unpleasant cognitive discomfort that is associated with holding strong positive and negative evaluations. These efforts, however, can be misled by limited cognitive resources and automatic biases (van Harreveld, 2001). Ambivalence can, therefore, produce attitudes, decisions, and behaviors that are unstable, pliable, not well-grounded (Conner & Armitage, 1998), and generate postfact rationalizations (Haidt, 2001). As such, ambivalence readily creates a dysfunctional cognitive process driven by adverse coping and defensive mechanisms (Ashforth et al., 2014). It is important to note that consistent with past research, I focus on substantive ambivalence (high intensity) rather than superficial ambivalence (low intensity) because lower levels of ambivalence are more likely to be ignored by individuals (Ashforth et al., 2014; Horney, 1945).

To further clarify its conceptual distinctiveness, I contrast ambivalence to the constructs of indifference, uncertainty, ambiguity, and dissonance. First, indifference does not activate internal conflict, nor does it require psychological involvement or arousal (Cacioppo & Berntson,

1994) whereas ambivalence does. Second, psychological uncertainty indicates a “lack of knowledge” to form a preference (Downs, 1957). Although uncertainty decreases as the knowledge about a target increases, ambivalence can increase with more information. Third, closely related to uncertainty, ambiguity is “the subjective experience of missing information relevant to a prediction” (Frisch & Baron, 1988: 152). Ambiguity arises from an individual’s vagueness regarding key social phenomena, whereas ambivalence emerges with conflicting evaluations even when an individual fully understands the relevant phenomena. Finally, cognitive dissonance (Festinger, 1957) is mostly generated by conflicts between cognition and behavior. Individuals experiencing dissonance have a prior commitment to a behavior that is not aligned with their attitudes. In contrast, ambivalence typically precedes any behavioral manifestation or response. Individuals experiencing ambivalence “have not yet committed themselves by making a choice between the opposing behavioral beliefs” (van Harreveld, Rutjens, Rotteveel, & Nordgren, 2011: 48); that is, they are sitting on the fence (for a comprehensive review see Ashforth et al., 2014).

Next, I explain how ambivalence can result in functional outcomes at the individual level of analysis from a social cognition theoretical framework. Scholars have cautioned that individuals experiencing ambivalence can take decision-making shortcuts to minimize their psychological discomfort (Cacioppo et al., 1997; Cramer, 2006). Others, however, have suggested that individuals experiencing ambivalence can thoroughly investigate the situation when interpreting the context (Ashforth et al., 2014; van Harreveld et al., 2011). That is, ambivalence can prompt individuals to approach interrelated alternatives, and avoid oversimplifications in an effort to understand and deal with the source of their ambivalent state (Rees, Rothman, Lehavy, & Sanchez-Burks, 2013; Weick, Sutcliffe, & Obstfeld, 2005).

Following this rationale and building on social cognition theory, I propose that individuals who are able to identify the causes of their ambivalence will tend to make more effective decisions because they will pay attention to contrasting relevant contextual and moral cues and engage in cognitive processes that counteract their adverse coping and defensive mechanisms.

Identified Ambivalence and Functional Outcomes

Scholars have recently begun to examine the functional outcomes of ambivalence. Ashforth and colleagues (2014) posited that individuals experiencing ambivalence can proactively accept the ambivalent situation and engage in positive conscious coping mechanisms to minimize the psychological discomfort. Individuals experiencing ambivalence can “simultaneously acknowledge and embrace opposing orientations, and thereby strive for a course of action that honors both” (Ashforth et al., 2014: 13). Unlike compromising and quickly choosing one option, individuals experiencing ambivalence can deliberate about opposite contextual characteristics and adopt a holistic response to thoroughly understand the duality of the situation. Ashforth and colleagues’ (2014) general contention is that individuals experiencing ambivalence are also open to new ideas, try to incorporate new ideas in their thinking, and are committed to the decision.

Further, I proposed in Chapter 1 that ambivalence can facilitate sense-building initiatives and collaborative contextual interpretations in leadership processes when leaders and followers share ambivalence about the same situation. In particular, I theorized that shared ambivalence can provide leaders and followers cognitive flexibility by both expanding and deepening cognitive evaluations of the option set. Different from situations when the leader or the follower tries to exert influence over the other, situations characterized by shared ambivalence prompt inquiry, which can minimize the effects of social schemas in the contextual interpretational

effort. Thus, when leaders and followers experience ambivalence, they tend to pay attention to and integrate a broad set of salient and vivid situational signals to jointly interpret complex contexts.

Fiske and Taylor (1984) proposed that individuals pay attention to contextual cues that are salient, vivid and accessible. Similarly, Reynolds (2009) suggested that saliency, vividness, and accessibility of morals cue can drive individual's attention to moral issues. Saliency refers to the perceived contextual relevance of the stimuli; vividness is a property of the stimuli regardless of the context; accessibility refers to the easiness of identifying and recognizing stimuli. Individuals tend to save cognitive resources for future use paying attention to a few salient and vivid contextual cues and relying on simple and time-efficient strategies to evaluate information and make decisions (Fiske & Taylor, 1984).

Building on this theoretical logic and prior evidence, I posit that *identifying* the causes of ambivalence can counteract dysfunctional responses to psychological discomfort because knowing the causes of ambivalence enables individuals to deliberately process salient, vivid, cognitively accessible, opposite, or conflicting contextual and moral cues. Identified ambivalence allows individuals to focus their limited cognitive resources on the situation, which frees up their cognitive resources from competing demands. As such, individuals experiencing identified ambivalence can counteract automatic and speculative decisions by more systematically processing information as compared to individuals who do not know the causes of their ambivalent state.

In the following section I explain the rationale for choosing social cognition theory as the main theoretical framework for this chapter. I first present three other potential theoretical frameworks and explain why they were not selected as the main theoretical framework. The

purpose of the following discussion, therefore, is to provide the logic supporting the overall theoretical framework choice.

Theoretical Framework for Identified Ambivalence

Consistent with the general body of research on ambivalence, I identified four potential overall frameworks that have been adopted to explain the effect of ambivalence on decision-making processes and behaviors: (1) meta-cognition, (2) heuristic-systematic model, (3) effort-accuracy; and (4) social cognition theory. I briefly review each of these theoretical frameworks and provide my rationale for not using the first three frameworks for examining the key research questions in my dissertation.

Meta-cognition theory emphasizes the role of executive processes in overseeing and regulating cognitive processes (e.g. Lories, Dardenee, & Yzerbyt, 1998; van Zile-Tamsen, 1996). Individuals can adopt metacognitive strategies to control cognitive activities and to ensure that a cognitive goal has been met (e.g. interpreting the context). These processes help to regulate and oversee changes in attitudes, and consist of planning and monitoring cognitive activities, as well as checking the outcomes of those activities (Brown, 1987).

Petty, Brinol, Tormala, and Jarvis (2006), adopted meta-cognition as their theoretical framework to explain the presence of implicit ambivalence. The authors proposed the PAST model, or “past attitudes are still there”, to explain inconsistent findings in attitudinal changes that have been reported in the literature (for a review, see Dovidio, Kawakami, & Beach, 2001). The PAST model suggests that prior attitudes can still impact current evaluative responses if the link between the attitude object and the prior attitude is stronger than the link between the attitude object and the current attitude. As such, the false tag in the prior attitude would not be spontaneously accessible, creating both positive and negative reactions that can simultaneously

influence an individual's responses. This situation, then, creates implicit ambivalence, and makes individuals who experience implicit ambivalence, longer processing time for information than individuals who do not experience any attitudinal change.

Although meta-cognition theory explores the activation of monitoring mechanisms and regulation of attitudinal changes, I did not adopt the meta-cognition theory as the theoretical framework for my dissertation research because my focus was on explicit ambivalence, or situations in which individuals self-report experiencing strong cognitive conflict. In these situations, individuals experience a fluid cognitive state in which attitudes have not been formed. In addition, meta-cognition theory does not explain why individuals consciously pay attention to both positive and negative contextual cues.

A second potential framework that I identified is the heuristic-systematic model (HSM, Chaiken, Liberman, & Eagly, 1989), which focuses on the processing of persuasive communications. According to HSM individuals can process information heuristically or systematically. The preferred cognitive process, however, is a function of the discrepancy between the individual's actual confidence with regard to his or her attitude, and the degree of confidence he or she desires. Researchers on ambivalence have adopted this theoretical framework to suggest that individuals experiencing ambivalence will engage in cognitive elaboration because their actual confidence is below the desired level (Jonas, Broemer, & Diehl, 2011).

Although the HSM model can explain why individuals engage their limited cognitive resources to decrease existing evaluative inconsistencies, it does not explain which contextual cues will be driving the individuals' attention, a key focus of my dissertation. In addition, considering that HSM investigates "validity seeking" persuasion settings *within* the social

context, individuals can agree with socially acceptable perspectives before uncovering unshared information. In this coping strategy, therefore, individuals will keep their actual confidence level the same, but decrease their desired level to conform to group preferences. Based on the prior arguments, ambivalence, from a HSM perspective, can also be reduced by social pressure, instead of the process of cognitive elaboration, and can therefore lead to ineffective decisions.

As it relates to my dissertation focus, I opted not to incorporate this framework because HSM implies that ambivalence can be reduced by social interactions that change individuals' accepted level of cognitive discomfort. As such, individuals can achieve a more pleasant cognitive state by automatically accepting persuasive attempts that focus on one-sided information, instead of deliberately processing conflicting information. Although social interactions can be an important factor in reducing ambivalence, my intra-psychological model of ambivalence focuses on how individuals process relevant information.

A third framework that I considered is the effort-accuracy framework, which suggests that decision makers have two conflicting goals: minimize cognitive effort and maximize accuracy (Payne, Bettman, & Johnson, 1993). van Harreveld and colleagues (2009) adopted this framework to suggest that individuals experiencing ambivalence will try to avoid making a decision, unless the decision cannot be avoided. They reasoned that individuals will procrastinate because this coping strategy is the least cognitively demanding.

Although this effort-accuracy framework suggests that individuals can also aim at maximizing accuracy, it does not describe the conditions under which individuals prefer engaging their cognitive resources to avoid the experience of psychological discomfort in the future. This model, therefore, suggests individuals, in general, are reactive to contextual cues; what it does not explain is the proposed proactive contextual search to eliminate the ambivalent

cognitive state. In my theory of identified ambivalence, proactivity is key to uncovering relevant conflicting information that increases contextual and moral awareness, which, in turn, leads to decision effectiveness. Therefore, I did not adopt the effort-accuracy framework in my theorizing of identified ambivalence.

Consistent with recent research on ambivalence, I have adopted social cognition theory as the theoretical framework for this chapter for four reasons. First, social cognition researchers do not assume that contextual cues are necessarily consistent with one another. Therefore, individuals can pay attention to positive and negative cues simultaneously. Second, researchers on social cognition have focused on how individuals deal with cues that are inconsistent with existing schemas or stereotypes (e.g., Hamilton & Sherman, 1994). Thus, individuals can overcome initial impulses and control their automatic reactions when they engage in cognitive elaboration. Third, according to social cognition theory, not all relevant cognitive elements can be cognitively accessible. Consequently, individuals can pay attention to irrelevant information creating speculative thinking, when they do not identify the causes of their ambivalence. Fourth, researchers on social cognition theory proposed that individuals are cognitive misers. This is consistent with my proposition that individuals who identify the source of their ambivalence protect their cognitive resources from competing goals maximizing, therefore, the use of their available resources.

In the following sections I further explore ambivalence to develop a model in which identified ambivalence influences decision-making effectiveness at the individual level of analysis. I propose that identified ambivalence can make contextual and moral aspects of the decision more salient, vivid, and accessible which, in turn, facilitates the processing of relevant and interrelated information. I also suggest that identified ambivalence interacts with trait-like

constructs (trait self-control and perceptual moral attentiveness) to predict contextual and moral awareness, and, consequently, decision effectiveness.

Hypotheses Development

Social cognition research on goal-shielding theory (Shah & Kruglanski, 2002) can inform how individuals experiencing identified ambivalence focus their cognitive resources to thoroughly process information prior to making decisions. This research suggests that individuals regulate attentional focus by inhibiting potentially distracting alternative goals (e.g., Fishbach & Shah, 2006). Goals that compete for the same attentional resources are connected with inhibitory links and the activation of the focal goal typically inhibits rival goals, which prevents the pulling away of attentional resources and maximizes resources available for pursuit of the focal goal (Shah & Kruglanski, 2002). In an effort to focus limited attentional resources toward the focal goal, individuals experiencing ambivalence regulate alternative goals. The cognitive discomfort toward structurally related causes increases individuals' commitment and persistence toward solving the conflict. Goal shielding, therefore, supplies cognitive resources to deliberately combine opposite aspects of the decision.

By deliberately processing related information prior to making decisions, identified ambivalence can facilitate effective decision making. Because individuals experiencing identified ambivalence do not rely solely on heuristics to minimize cognitive discomfort, the traditional errors and biases in answers to inferential problems are less likely to result (e.g., Kahneman & Tversky, 1972, 1973; Tversky & Kahneman, 1971, 1973). Although cognitive shortcuts are functional from an evolutionary standpoint, they can lead to dysfunctional behaviors, and decision-making inconsistency across individuals especially when operating in complex situations (for a review see Kahneman, 2011; Kahneman & Klein, 2009). Following

Kahneman's (2011) assertion that effective decisions are decisions that are not influenced by cognitive biases, I propose the following:

Hypothesis 1: Identified ambivalence is positively related to decision effectiveness.

The Mediating Roles of Contextual Awareness and Moral Awareness

To provide a richer explanation of why identified ambivalence influences decision effectiveness, I draw on theories of self-awareness, specifically contextual and moral awareness. Prior research indicates that higher levels of self-awareness facilitates effective decision making across a broad range of complex and dynamic contexts, including health care (Schulz et al., 2013), emergency response and military command (Blandford & Wong, 2004; Gorman, Cooke, & Winner, 2006), offshore oil and nuclear power plant management (Flin & O'Connor, 2001), and ethical challenges/dilemmas (Trevino, 1986). Contextual awareness involves a conscious registration of stimuli in the individual's mind (Brown et al., 2007; Kyaniponika, 1973). When a stimulus is strong, attention is engaged, which usually is manifested as an initial "taking notice of" or "turning toward" the situation (Nyaniponika, 1973). Therefore, contextual awareness facilitates individual's knowledge of what is helping her to decide what to do (Adam, 1993). Researchers have suggested that only those pieces of information that are relevant to the decision at hand are salient for individuals high in contextual awareness (Endsley, Bolte, & Jones, 2003). Contextually aware individuals perceive the status, attributes, and dynamics of relevant elements in the environment (Endsley & Garland, 2000).

I propose that individuals who experience identified ambivalence become consciously aware of and attentive to their surroundings and start deliberately processing contrasting relevant cues. Take, for instance, a marketing manager responsible for the release of a new product. Although she has other competing goals, such as evaluating the performance of her

staff, she focuses her cognitive resources on the release of the new product. The new product has positive and negative characteristics. On the one hand, it has a great value proposition for clients; on the other hand, it can be easily copied by the competition. In the process of solving her ambivalent state, she scrutinizes the competitive environment and becomes aware of internal and external forces that could make or break the new product's success. In the end, the marketing manager comes up with a new and more comprehensive plan that she proposes to the company. These arguments and example suggest that contextual awareness mediates the relationship between ambivalence and decision effectiveness.

Hypothesis 2: Contextual awareness mediates the relationship between identified ambivalence and decision effectiveness.

Moral awareness is a conscious determination that the situation contains moral content (Reynolds, 2008). Similar to contextual information, moral issues can vary in saliency and vividness (Jones, 1991), which increases the likelihood that an individual will pay attention to those characteristics and classify the issue as a moral issue. Building on Jones (1991), Frey (2000), and May and Pauli's (2002) work on moral intensity, Reynolds (2008) suggested that presence of harm and violation of behavioral norms are associated with moral awareness. Harm is the extent to which an individual or group is injured physically, psychologically, or economically (Collins, 1989); whereas norms are rules of conduct that specify what should and should not be done in social situations (Williams, 1960). Thus, situations can have contextual and moral attributes that are independently or jointly accessed.

Research on cognitive models of moral decision making (e.g., Kohlberg, 1981; Rest, 1986) posits that morality is a conscious and cognitive demanding process (Gino et al., 2011). According to Rest's model of moral behavior, this cognitive process starts with the recognition

that the issue is a moral issue (i.e., moral awareness). Next, moral agents make a moral judgment, establish moral intent, and finally act on the moral concerns. Identifying the moral issue is a critical step in a multistate ethical decision-making process (Ferrel & Gresham, 1985; Trevino, 1986). Importantly, a person can have different patterns of moral awareness in different situations (Gino et al., 2011; Trevino, 1986). Research has shown that recognizing ethical issues associated with a decision and reasoning through moral dilemmas requires cognitive resources (Bazerman, Gino, Shu, & Tsay, 2013). Indeed, systematic processing results in higher levels of recognition of moral issues in a specific situation (Gino et al., 2011) when compared to peripheral processing of information. Thus, cognitive resources seem to be necessary for individuals to become aware of moral issues.

I propose that individuals who experience identified ambivalence engage in deliberative cognitive processes that facilitate the detection of moral issues. As positive and negative aspects of the situation become scrutinized, individuals tend to expand their circle of inclusiveness and incorporate potential social consequences in their analysis (e.g., utilitarianism: Mill, 1861/1998). Similar to research on moral identity that suggests individuals whose morality is central to their self-concept have a broader “circle of moral regard” (Aquino & Reed, 2002), identified ambivalence can activate a moral radar broadening the scope of their moral inclusiveness. Identified ambivalence can also increase the availability of cognitive resources to detect and process moral issues by minimizing the influence of distracting goals. As individuals experiencing identified ambivalence regulate their attentional focus toward the sources of their cognitive discomfort, they avoid expending cognitive resources on nonrelated issues. Such cognitive shields provide resources for the proper functioning of the moral radar. Accordingly, I hypothesize the following:

Hypothesis 3: Moral awareness mediates the relationship between identified ambivalence and decision effectiveness.

The Moderating Roles of Trait Self-Control and Perceptual Moral Attentiveness

I have argued that identified ambivalence influences decision effectiveness via contextual and moral awareness, and I expect the strength of these relationships to differ based on the level of trait-like constructs. Traits are latent potentials that can be triggered into action by situational cues (Michel & Shoda, 1995). Decisions with multiple relevant opposite pieces of information can activate different behavioral responses based on individuals preferred *modus operandi*. Consequently, I turn my attention to examining how trait self-control (Tangney et al., 2004) and perceptual moral attentiveness (Reynolds, 2008) moderate the influence of identified ambivalence on contextual awareness and moral awareness, respectively.

Self-control is the ability to restrain or override one's automatic response (e.g., Baumeister et al., 2007). It involves inhibiting competing urges, behaviors, or desires (Barkley, 1997). Prior research has shown that many of the social and personal problems involve some component of deficient self-control (see Baumeister, Heatherton, & Tice, 1994). Self-control is also critical to the distinction between automatic and deliberative processes (e.g., Bargh, 1984). Self-control has been positively related to achievement and task performance (Feldman, Martinez-Pons, & Shaham, 1995; Shoda, Mischel, & Peake, 1990), impulse control (Baumeister et al., 1994), psychological adjustment (Carver & Scheier, 1981; Baumeister et al., 1994), and successful interpersonal relationships (Shoda et al., 1990).

Some individuals are generally better able to override their impulses than others. This individual difference in interrupting undesired behavioral tendencies is called trait self-control (Tangney et al., 2004). I propose that the effects of identified ambivalence on contextual

awareness will be stronger when trait self-control is low as compared to when self-control is high. Because individuals low in trait self-control are more impulsive than those who are high, they tend to be easily distracted by the multiple cues in the situations (Muraven, Shmueli, & Burkley, 2006). Individuals low in trait self-control also tend to navigate through life in an automatic mode (Bargh, 1994). As such, identified ambivalence can provide a vigilant state of mind that facilitates taking notice of and turning toward key aspects of the situation. When individuals are low in trait self-control, identified ambivalence triggers the balanced and focused cognitive deliberation necessary for a conscious registration of stimuli. As articulated before, I propose that contextual awareness influences decision effectiveness. Hence, it is logical to further predict that trait self-control moderates the indirect effect of identified ambivalence on decision effectiveness via contextual awareness.

Hypothesis 4: The indirect effect of identified ambivalence on decision effectiveness, via contextual awareness, is moderated by trait self-control, such that the indirect effect is stronger when trait self-control is low than when trait self-control is high.

Moral attentiveness is the extent to which individuals chronically perceive and consider morality and moral elements in their experiences (Reynolds, 2008). Drawing on social cognition theory (Fiske & Taylor, 1984), Reynolds (2008) theorized that an individual's cognitions can be dominated by morality making them chronically accessible. Individuals high in moral attentiveness draw from "a more general category of moral concepts that distinguish what is moral from what is nonmoral or amoral, as opposed to distinguishing between the moral and the immoral" (Reynolds, 2008: 1028). Research has shown that individuals tend to interpret ambiguous situations based on what is chronically accessible (Bargh, Bond, Lombardi, & Tota, 1986; Bargh & Pratto, 1986; Higgins, King, & Marvin, 1982). As such, individuals high in moral

attentiveness tend to interpret incoming stimuli through a lens focused on the concepts of morality.

Reynolds (2008) differentiated between perceptual moral attentiveness and reflective moral attentiveness. Individuals high in perceptual moral attentiveness tend to screen for and focus on moral dimensions of the information, and thus they are prone to over represent the moral aspects of the situation by being more aware of those moral aspects (Reynolds, 2008). Individuals high in reflective moral attentiveness tend to behave morally without cognitive deliberation. Reflective moral attentiveness is consistent with intuitive or reflexive models of moral decision making (Haidt, 2001; Reynolds, 2006) and does not necessarily predict behavior.

In this article, I focus on perceptual moral attentiveness because the conceptual model presented here (1) is based on cognitive models of morality in which awareness is a relevant step to making effective decisions; (2) highlights the influence of situational cues as triggers of cognitive deliberation that minimizes automatic influences on effective decisions; and (3) suggests that individuals consciously balance relevant contextual information.

Parallel to the logic regarding trait self-control, I propose that the positive relationship between identified ambivalence and moral awareness will be stronger when perceptual moral attentiveness is low, as compared to when it is high. Individuals who are low in perceptual moral attentiveness usually fail to recognize the moral aspects of the context. In these situations, identified ambivalence can provide the moral radar, which helps individuals to identify contextually moral relevant cues. When individuals are high in perceptual moral attentiveness, the identification of a moral issue happens without cognitive deliberation, weakening the relationship between identified ambivalence and moral awareness. We, therefore, predict that

perceptual moral attentiveness moderates the indirect effect of identified ambivalence on decision effectiveness via moral awareness.

Hypothesis 5: The indirect effect of identified ambivalence on decision effectiveness, via moral awareness, is moderated by perceptual moral attentiveness, such that the indirect effect is stronger when perceptual moral attentiveness is low than when perceptual moral attentiveness is high.

Overview of Empirical Studies

I tested the hypotheses in four studies employing multiple methodologies to “avoid the inevitable vulnerabilities that emerge from relying on particular methodological approaches” (Chatman & Flynn, 2005: 434). In Study 1, I conducted a laboratory experiment to examine whether individuals experiencing identified ambivalence are less likely to make choices influenced by framing effect (Kahneman, 2011; Kahneman & Tversky, 1979) than individuals experiencing indifference, positivity, or negativity. Next, in Study 2 I collected field data in 2 nonoverlapping samples composed of workers from different companies representing all geographic regions in the United States. In this study, I replicated the test of Hypothesis 1. I also used a different ambivalence manipulation, which allowed us to triangulate the results; and I further ruled out affective state as an alternative explanation for the findings. In Study 3, I employed the same manipulation as in Study 2; additionally, I tested Hypotheses 2 and 3 (mediation) by measuring contextual awareness and moral awareness. Finally, in an attempt to adopt a full-cycle approach (Chatman & Flynn, 2005), I went back to a laboratory study to investigate theoretically relevant boundary conditions. Thus, in Study 4, I measured two relevant individual difference variables: trait self-control and perceptual moral attentiveness. I tested whether trait self-control interacted with identified ambivalence to predict contextual awareness

and whether perceptual moral attentiveness interacted with identified ambivalence to predict moral awareness, which in turn affects individuals' decision effectiveness (Hypotheses 4 and 5). Taken together, these studies aim to demonstrate why, how, and when identified ambivalence influences decision effectiveness.

Study 1: Identified Ambivalence and Decision Effectiveness

Participants

I collected data from 201 students in a large U.S. university. Among the participants, 103 were male (51%) and had an average age of 22.19 years (s.d. = 3.19). These students participated in a short online survey in exchange for course credits. Ten participants were deleted from the sample because they completed the task in less than two minutes or failed to complete the whole task. The final sample size was composed of 191 subjects, and t-tests showed that the final sample did not differ from the original sample in age and gender.

Procedures

Respondents were randomly assigned to one of four attitudinal conditions (ambivalence, indifference, positivity, or negativity) and asked to write a paragraph about their own experience. Past research has shown that asking participants to indicate thoughts about experiences successfully induces cognitive states (Fong, 2006; van Harreveld et al., 2009; Schneider, Eerland, van Harreveld, Rotteveel, van der Pligt, van der Stoep, & Zwaan, 2013). Next, respondents were randomly assigned to one of two contextual framing (gain or loss) conditions (Kahneman & Tversky, 1979) and asked to make decisions (see Appendix A). Finally, participants completed scales on felt ambivalence, identified ambivalence, and provided demographic information. On average, participants took 11 minutes to complete the entire survey.

Measures

Decision effectiveness. I measured decision effectiveness via mitigations of the framing effect on participants' decisions. As noted above, participants were randomly assigned to a gain or a loss contextual framing condition and were asked to make a choice between two programs developed to treat a deadly disease. In the gain condition, the context was presented as a lifesaving decision, whereas in the loss condition the context was introduced as a life loss decision. Respondents, then, were given a choice between program A, program B, and either program. It is important to clarify that program A and B had the same expected value (one-in-three chance of saving 600 lives). However, according to Kahneman and Tversky (1979), individuals presented with the gain condition are more likely to be risk averse, and individuals presented with the loss condition are more likely to be risk takers. I considered that the "either program" answer was the most effective decision because it demonstrated that respondents were not influenced by contextual framing.

Felt ambivalence. I used a 3-item scale developed by Priester and Petty (1996) to measure felt ambivalence. The items included "How conflicted do you feel?," "How much indecisiveness do you feel?," "Do you have mixed reactions?" (Cronbach's $\alpha = .82$).

Identified ambivalence. I assessed identified ambivalence by asking participants to report the cause of their ambivalence. Across each of the three items used to measure felt ambivalence, participants were asked to identify whether the initial writing task (i.e., their paragraph regarding their own experience; coded as 1) or the decision about the program to combat the deadly disease (i.e., program A, B, or either; coded as 2) caused their felt ambivalence. I then averaged the scores of the three items to create the identified ambivalence variable. Higher scores indicated a greater ability for participants to identify the focal decision, instead of the unrelated contextual

prime, as the source of their ambivalence. Thus, consistent with my theoretical arguments, identified ambivalence represented ambivalence associated with the relevant decision-making context (Cronbach’s $\alpha = .77$).

Controls. I controlled for participants’ age, gender, and work tenure.

Results and Discussion

Means, standard deviations, and correlations for the variables of interest appear in Table 1. It is important to note that “felt ambivalence” refers to levels of experienced ambivalence and “identified ambivalence” refers to the degree to which participants explicitly recognized the cause of their experienced ambivalence. There were no significant correlations between the decision-making outcome and felt ambivalence, and the decision-making outcome and identified ambivalence when all eight conditions (4 x 2) were taken into consideration.

Table 1: Descriptive Statistics and Correlations for Study 1 Variables^a

	Mean	SD	1	2	3	4	5
1. Felt Ambivalence	2.60	.88	(.82)				
2. Identified Ambivalence	1.60	.41	.10	(.77)			
3. Decision^b	1.94	.82	.14	-0.01			
4. Age	21.79	3.37	-.11	-.09	.05		
5. Gender^c	.52	.50	.05	.12	-.09	-.20**	
6. Tenure^d	48.73	44.21	-.11	-.13	-.03	.78**	-.08

^a $N = 191$; ^b Program A=1, Program B=2, and Either Program=3; ^c female = 0, male = 1; ^d Tenure in months; * $p < .01$, ** $p < .05$; scale reliabilities are presented within parentheses along the central diagonal.

Manipulation Check

The written recall task successfully produced the desired ambivalence state. Analysis of covariance (ANCOVA) with age, gender, tenure, and contextual framing condition as covariates demonstrated that the ambivalence condition did influence individuals’ felt ambivalence levels during the decision task ($F[7,183] = 3.26, p = .01$). Results from a series of planned contrasts

showed that participants in the ambivalence condition reported significantly higher levels of felt ambivalence ($\bar{x} = 3.05$, $s.d. = .90$) when compared to indifference condition ($\bar{x} = 2.34$, $s.d. = .85$, $p < .01$), positivity condition ($\bar{x} = 2.45$, $s.d. = .90$, $p < .01$), and negativity condition ($\bar{x} = 2.54$, $s.d. = .88$, $p < .01$). Similar analyses were conducted splitting the sample based on the contextual framing condition (i.e., gaining or loss); however, as expected, the results remained similar. Following principles of parsimony, I presented the analyses with the combined contextual framing conditions only.

Ambivalence and Decision

In general, Study 1 replicated the framing effects proposed by Kahneman and Tversky (1979). A series of one-sample t -tests between proportions showed that individuals were risk avoidant (54% chose program A; 20% chose program B; 26% chose either program; $t(99) = 4.30$, $p < .01$; $t(99) = 3.30$, $p < .01$) when the context was framed as gains and risk takers (17% chose program A; 48% chose program B; 35% chose either program; $t(90) = 3.97$, $p < .01$) when the context was framed as losses (see Figures 3 and 4). However, there was not a significant difference between program B and either program ($t(90) = 1.37$, $p = 1.17$) when the context was framed as losses. A potential explanation for this null effect is that contexts framed as losses can activate a more vigilant cognitive process in general.

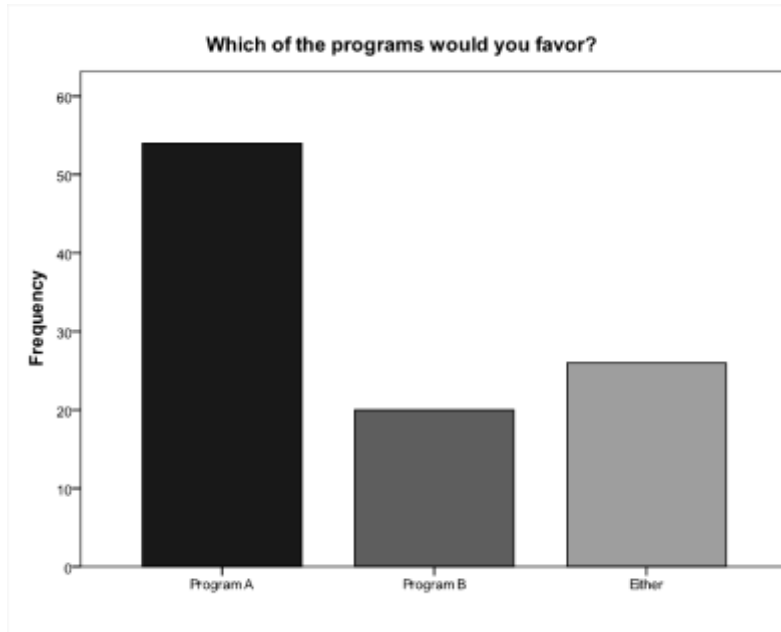


Figure 3: Gain Contextual Framing for Study 1

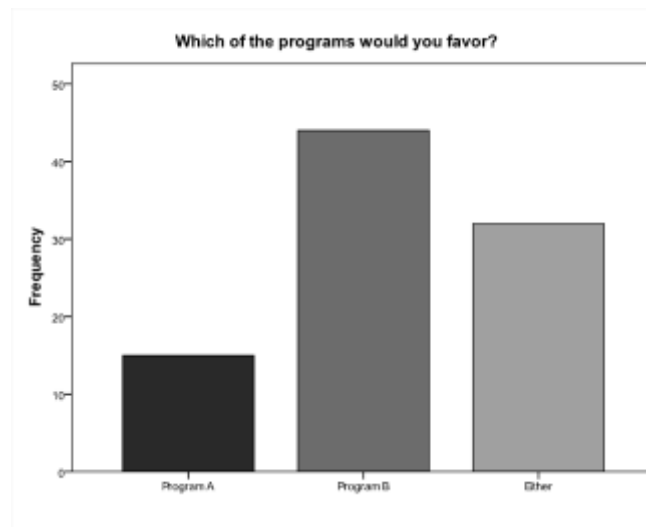


Figure 4. Loss Contextual Framing for Study 1

In an effort to understand whether the decision was a function of the participants’ cognitive state (i.e., ambivalence, indifference, positivity, or negativity), I conducted Chi-square analyses. The analyses showed that individuals experiencing ambivalence chose the option “either” more often than their counterparts experiencing indifference, positivity, or negativity ($\chi^2[6]$, $N = 100$, $p < .01$; $\chi^2[6]$, $N = 91$, $p < .05$; gain and loss contextual framing, respectively)

(see Figures 5 and 6 for graphical representations). The option “either” is the most effective decision because both programs A and B have the same expected value (one-in-three chance of saving 600 lives); thus, individuals who selected “either program” were not affected by contextual framing.

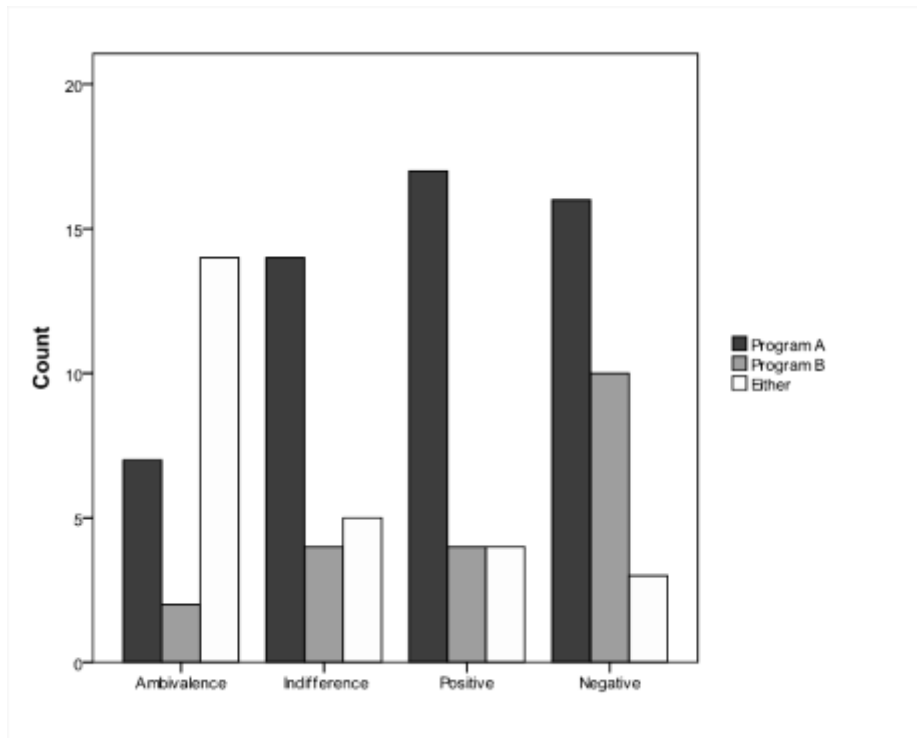


Figure 5: Gain Contextual Framing per Cognitive State Study 1

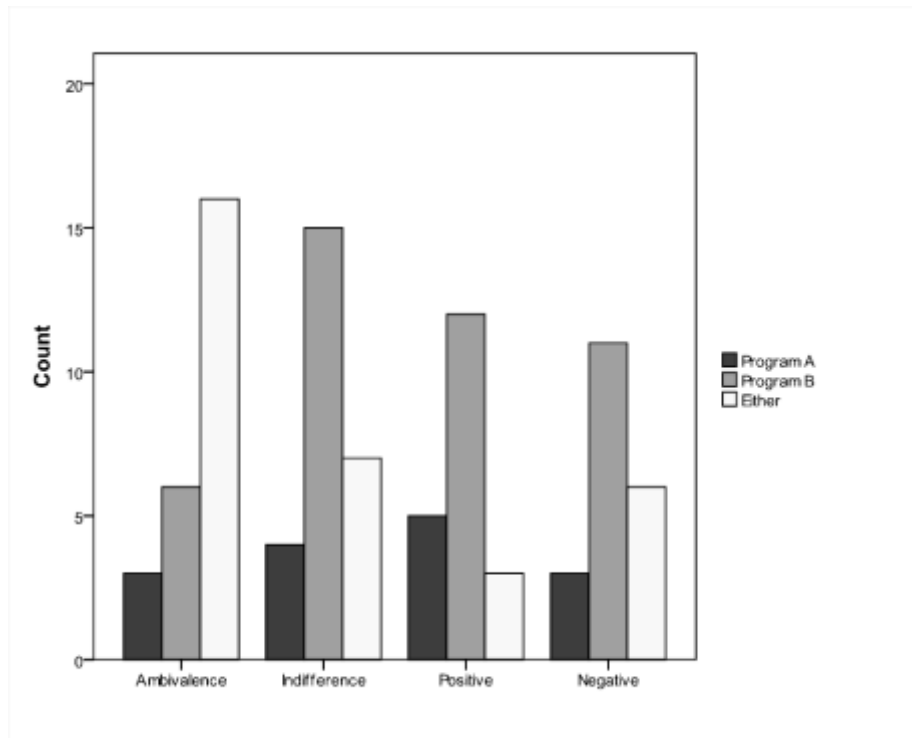


Figure 6: Loss Contextual Framing per Cognitive State for Study 1

Next, I conducted a logistic regression analysis to examine the relationship between identified ambivalence and decision effectiveness. Considering that identified ambivalence is a property of ambivalent states and that participants assigned to the ambivalence condition experienced significantly higher levels of ambivalence than participants in the other three conditions, I ran the analyses of identified ambivalence with only participants in the ambivalence condition. I collapsed both biased decisions (Program A and B) to create a dichotomous variable because I was interested in the different effects of identified ambivalence in terms of decision effectiveness. The dichotomous variable represented decision effectiveness and consisted of biased decisions (coded as 0) and effective decisions (coded as 1). Since the contextual framing condition had a null effect on decision effectiveness, I also collapsed the two contextual framing conditions in order to increase sample size. Results showed (see Table 2) that after controlling

for age, gender, tenure, and contextual framing condition, identified ambivalence had a positive and significant effect on decision effectiveness (Exp $b = 1.83$, $p < .05$).

Table 2: Logistic Regression of Identified Ambivalence on Decision for Study 1^a

Variables	Exp(B)b	Wald statistics
Age	1.18	.64
Gender	1.12	.02
Tenure	.98	.74
Contextual Framing	.89	.03
Identified Ambivalence	1.83	3.84**
-2 Log likelihood		57.03

^a $N = 48$; ^bthe entries are exponentiated b 's. Entries above 1.00 indicate positive effects, and entries below 1.00 indicate negative effects; ** $p < .05$

Study 2: Generalizability of Identified Ambivalence Effects on Cognitive Limitations

Participants

I recruited 312 working professionals (153 male; average age of 42.23 years, s.d. = 15.25) from a variety of companies representing all geographic regions in the United States using SurveyMonkey (surveymonkey.com), an online survey recruitment and administration tool. Ten participants completed the survey in less than two minutes and four did not pass the manipulation check. These participants were dropped from the analyses.

Procedures

Similar to Study 1, respondents were randomly assigned to one of four attitudinal conditions (ambivalence, indifference, positivity, or negativity). However, instead of writing a paragraph about their own experiences, participants read a short article on genetically modified food adapted from Nordgren, van Harreveld, and der Pligt (2006) (please see Appendix B). In an effort to induce ambivalence, five positive consequences (e.g., increased food production and reduced pesticide use) and five negative consequences (e.g., unknown health risks and causes environmental problems) of GM food were embedded in the article. The positive (negative)

condition received the positive (negative) consequences only, and the indifferent condition read a neutral and unrelated story. Participants then were asked to select statements that accurately described the main arguments of the readings and were deleted from the analyses if they chose positive (negative) consequences when assigned to the negative (positive) condition. Next, respondents were randomly presented with one of the two contextual framing conditions (Kahneman & Tversky, 1979) adopted in Study 1, and filled out scales on felt ambivalence, identified ambivalence, affective states and reported their demographics. Participants took on average 12 minutes to complete the survey.

Measures

Decision effectiveness. Consistent with Study 1, I measured decision effectiveness as the reduction of the framing effect's influence on participants' decisions.

Felt ambivalence. I adopted the same scale (Priester & Petty, 1996) used in Study 1 to measure felt ambivalence (Cronbach's $\alpha = .88$).

Identified ambivalence. I assessed identified ambivalence by asking participants to report the source of their ambivalence (i.e., short article on GM food, coded as 1; or program decision about the deadly disease, coded as 2). Similar to Study 1, higher scores indicated a greater ability by participants to identify the relevant decision-making context (i.e., the focal decision), instead of the unrelated contextual prime, as the source of their ambivalence (Cronbach's $\alpha = .79$).

Controls. Consistent with Study 1, I controlled for participants' age, gender, and tenure. Additionally, I controlled for participants' affective state. I measured positive and negative affective states with the 10 items short-form of the Positive and Negative Affect Schedule (PANAS; Thompson, 2007). Affective state was included as a control because research has shown that sadness and happiness influence general decisions. For instance, Rees, Rothman,

Lehavy and Sanchez-Burks (2013) found that emotionally ambivalent participants—individuals who felt highly happy and sad at the same time—made fewer errors when assessing weather temperature and answering trivia questions on general knowledge. I adopted PANAS to cover a broad set of affective states that could offer alternative explanations for the hypotheses (positive affective state, Cronbach’s $\alpha = .80$; negative affective state, Cronbach’s deliberately process-related information prior to making decisions $\alpha = .86$).

Results and Discussion

Means, standard deviations, and correlations of focal variables are presented in Table 3. I found null relationships between decision and felt ambivalence, and decision and identified ambivalence when all combined conditions were allowed to correlate.

Table 3: Descriptive Statistics and Correlations for Study 2 Variables ^a

	Mean	SD	1	2	3	4	5	6	7
1. Felt Ambivalence	2.05	.89	(.88)						
2. Identified Ambivalence	1.71	.38	.03	(.79)					
3. Decision ^b	1.98	.79	.10	-0.11					
4. Positive Affective State	3.00	.78	-.12**	-.01	.03	(.80)			
5. Negative Affective State	1.43	.65	.50*	.05	.02	-.04	(.86)		
6. Age	43.97	14.48	-.09	-.08	.07	.12**	-.01		
7. Gender ^c	.50	.50	-.15*	.01	-.05	.08	-.09	.10	
8. Tenure ^d	27.84	15.19	-.11	-.02	-.09	.16**	-.03	.84**	.21**

^a $N = 298$; ^b Program A=1, Program B=2, and Either Program=3; ^c female = 0, male = 1;

^d Tenure in years; * $p < .01$, ** $p < .05$; scale reliabilities are presented within parentheses along the central diagonal.

Manipulation Check

The short article and recall task resulted in the desired ambivalence state. An omnibus test (ANCOVA) controlling for positive and negative affect, age, gender, tenure, and contextual framing condition showed differences in the felt ambivalence levels among the four conditions ($F[9,288] = 5.80, p < .01$). This result was followed by a series of planned contrasts, which

demonstrated that individuals in the ambivalence condition felt significantly more ambivalent ($\bar{x} = 2.45, s.d. = .80$) than individuals in the indifference condition ($\bar{x} = 1.83, s.d. = .82, p < .01$), positivity condition ($\bar{x} = 1.89, s.d. = .79, p < .01$), and negativity condition ($\bar{x} = 1.97, s.d. = 1.02, p < .01$).

Ambivalence and Decision

Individuals who were more risk avoidant (48% chose program A; 23% chose program B; 29% chose either program; $t(137) = 3.65, p < .01$; $t(137) = 2.61, p = .01$) when the context was framed as gains and risk takers 18% chose program A; 51% chose program B; 31% chose either program; $t(159) = 5.48, p < .01$; $t(159) = 2.86, p = .01$) when the context was framed as losses (see Figures 7 and 8). Nevertheless, Chi-square analyses demonstrated that these patterns change based on participants' cognitive states, replicating the findings in Study 1 (see Figures 9 and 10 for graphical representations). Individuals experiencing ambivalence selected "either" more often than their counterparts experiencing indifference, positivity, or negativity ($\chi^2[6], N = 138, p < .01$; $\chi^2[6], N = 160, p < .05$; gain and loss framing condition, respectively). The null effect of the difference between program B and either program found in Study 1 was not replicated in this study.

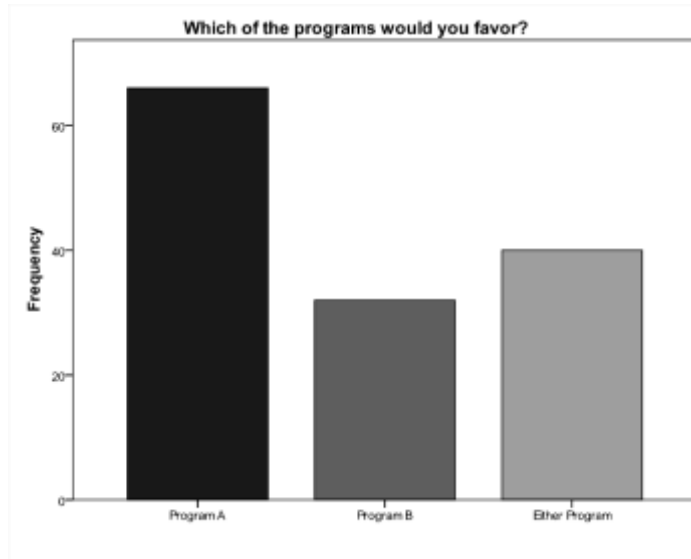


Figure 7: Gain Contextual Framing Condition for Study 2

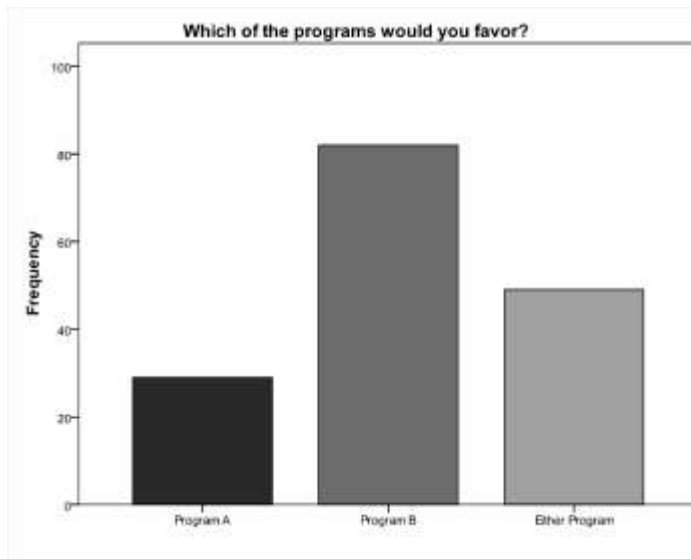


Figure 8. Loss Contextual Framing Condition for Study 2

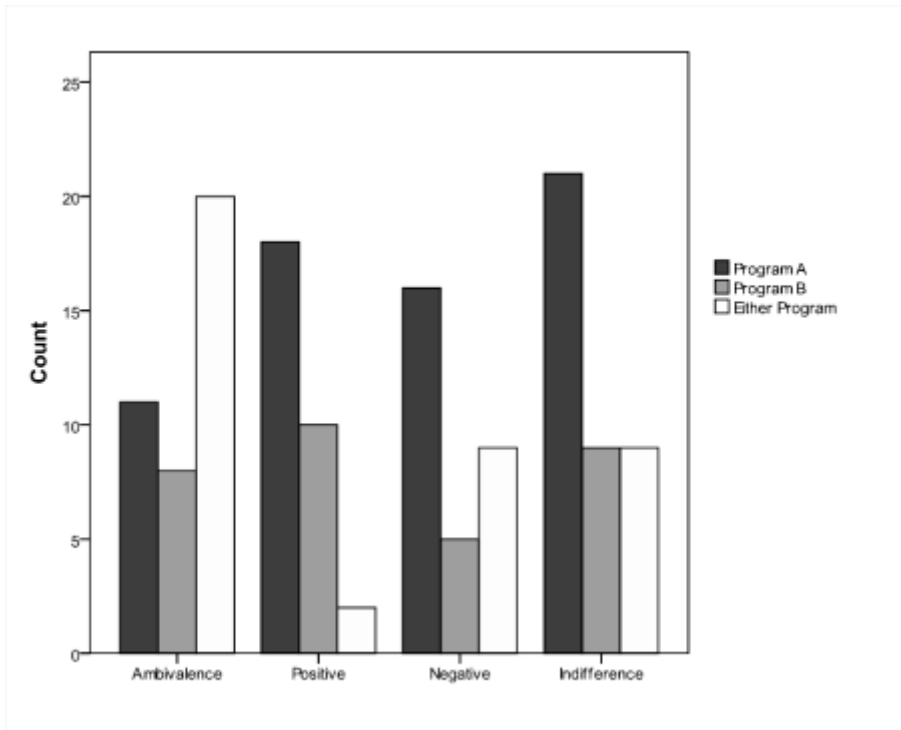


Figure 9: Gain Contextual Framing Condition per Cognitive State Study 2

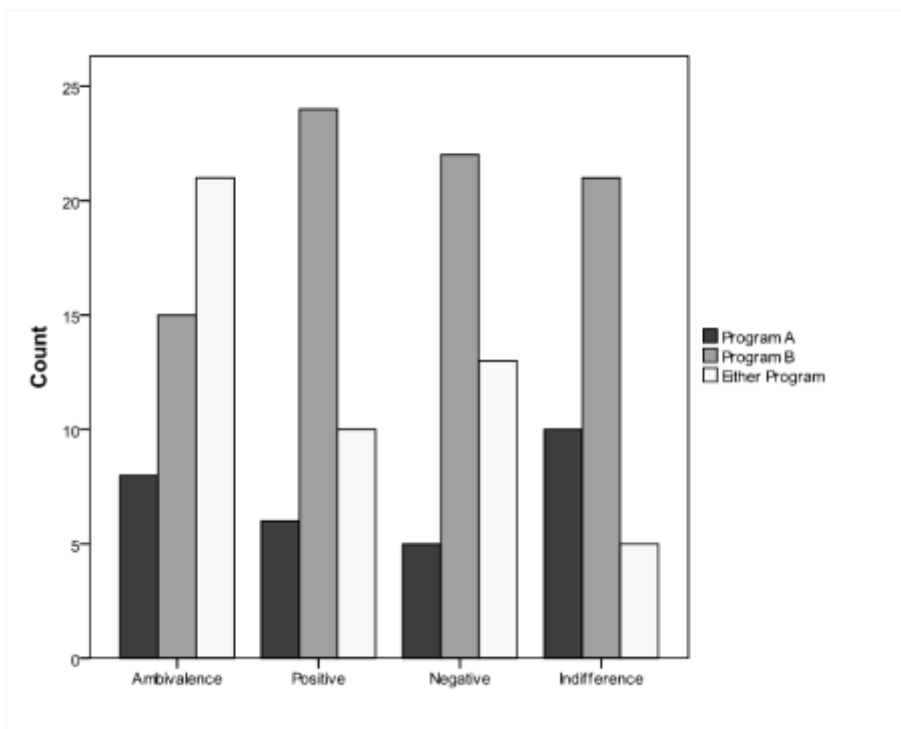


Figure 10: Loss Contextual Framing Condition per Cognitive State for Study 2

To test for Hypothesis 1, I examined the influence of identified ambivalence on decision effectiveness. Similar to Study 1, I selected participants in the ambivalence condition, and collapsed both biased decisions (Program A and B) to create a dichotomous variable. I controlled for positive and negative affective state, age, gender, tenure, and framing condition. Results of logistic regressions provided support for Hypothesis 1, suggesting that identified ambivalence had a significant effect on decision effectiveness ($\exp b = 6.64, p < .05$) (see Table 4). On the basis of this evidence, I conducted Study 3 to test the effect of two cognitive mechanisms through which, I posited, identified ambivalence influences decision effectiveness (Hypotheses 2 and 3).

Table 4: Logistic Regression of Identified Ambivalence on Decision for Study 2^a

Variables	Exp(B) ^b	Wald statistics
Age	1.01	.12
Gender	.99	.01
Tenure	1.01	.05
Contextual Framing	1.39	.46
Positive Emotions	.97	.01
Negative Emotions	1.23	.37
Identified Ambivalence	6.64	5.29**
-2 Log likelihood		108.05

^a $N = 83$; ^bthe entries are exponentiated b 's. Entries above 1.00 indicate positive effects, and entries below 1.00 indicate negative effects; ** $p < .05$

Study 3: Identified Ambivalence, Contextual Awareness, Moral Awareness, and Decision Effectiveness

Participants

A total of 305 U.S. working professionals (155 male; average age of 43.00 years, $s.d. = 14.85$) participated in this study. As in Study 2, these individuals were recruited through SurveyMonkey (surveymonkey.com). Thirteen participants were dropped from the analyses because they failed to recall key statements from the reading task or did not complete the survey.

Procedures

The study employed two between-subjects factors: attitudinal condition (ambivalence, indifference, positivity, or negativity) and contextual framing condition (gain or loss). In their first task, participants read one of the four short articles used in Study 2 and were thus exposed to one of the attitudinal conditions. Next, they were assigned to the same contextual framing conditions used before and had to make a choice after reading about a deadly disease. Then, participants filled out a scale that measured their felt ambivalence and reported the perceived origin of their ambivalent state (i.e., identified ambivalence). Finally, they were asked to participate in a word-fragment completion task (Bargh, Raymond, Pryor, & Strack, 1995) to measure contextual awareness and filled out a scale to assess moral awareness. On average, participants took 15 minutes to fill out the survey.

Measures

Felt ambivalence. Consistent with Studies 1 and 2, I assessed felt ambivalence with the 3-item scale developed by Priester and Petty (1996) (Cronbach's $\alpha = .85$).

Contextual awareness. I assessed contextual awareness with a word-fragment completion task (Bargh et al., 1995). I used an implicit measure of contextual awareness to avoid potential limitations with the use of explicit measures, such as social desirability (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), self-deceptive behaviors (Barrick & Mount, 1996), and faking (Morgeson, Campion, Dipboye, Hollenbeck, Murphy, & Schmitt, 2007). Individuals experiencing identified ambivalence engage in deeper cognitive processes, which can increase the accessibility of related concepts in associative memory systems (Smith & DeCoster, 2000). I developed a list of 20 word fragments by consulting online crossword solution tools and dictionaries. I also checked the *Frequency Dictionary of Contemporary American English* (Davies & Gardner, 2010) to see whether target and nontarget words had comparable

frequencies. Then, I pilot tested this list with subject matter experts to assure that the fragments had multiple solutions (e.g., CU__ E can result in CUBE, CUTE or CURE) and were representative of the context. After the first pilot test, five items were deleted due to poor quality (did not relate to the focal construct). The final list contained 15 word fragments. Participants were presented with the 15 word fragments and asked to fill in the missing letters to form real words as fast as they could. Six fragments were designed to allow participant to form words related to the deadly diseases decision they made before. The remaining nine were neutral fillers (see Appendix C). To measure contextual awareness, I added the number of decision-related words that each participant completed.

Moral awareness. I measured moral awareness with the scale developed by Reynolds (2008). This scale is composed of three items, such as, “There are very important ethical aspects to this situation” (Cronbach’s $\alpha = .85$).

Identified ambivalence. Consistent with Studies 1 and 2, participants were asked to report the cause of their ambivalence (Cronbach’s $\alpha = .86$).

Controls. I controlled for the same demographics (age, gender, and tenure) used in Studies 1 and 2. When applicable, I controlled for the contextual framing condition as well.

Results and Discussion

Table 5 shows the means, standard deviations, and correlations of the variables used in this study. I first examined the effectiveness of the ambivalence manipulation. An analysis of covariance (ANCOVA) with age, gender, tenure, and contextual framing condition as covariates demonstrated that felt ambivalence levels differ among the conditions ($F[7,284] = 5.28, p = .01$). Planned contrasts showed that individuals in the ambivalence condition were significantly more ambivalent ($\bar{x} = 2.38, s.d. = .90$) when compared to the indifference condition ($\bar{x} = 1.72, s.d. =$

.67, $p < .01$), positivity condition ($\bar{x} = 1.80$, $s.d. = .80$, $p < .01$), and negativity condition ($\bar{x} = 1.80$, $s.d. = .79$, $p < .01$). These analyses replicated the findings in Studies 1 and 2.

Table 5: Descriptive Statistics and Correlations for Study 3 Variables ^a

	Mean	SD	1	2	3	4	5	6	7
1. Felt Ambivalence	1.95	.85	(.85)						
2. Identified Ambivalence	1.64	.43	.06	(.86)					
3. Decision ^b	2.00	.80	.15**	-0.06					
4. Contextual Awareness	3.43	1.23	.09	.12**	.21*				
5. Moral Awareness	3.71	.78	.10	.05	.24*	.19*	(.75)		
6. Age	43.30	14.61	-.08	-.09	.04	.04	.05		
7. Gender ^c	.49	.50	-.01	.08	.02	.10	-.01	.03	
8. Tenure ^d	27.69	14.38	-.09	.01	.03	.04	.09	.86*	.11

^a $N = 292$; ^b Program A=1, Program B=2, and Either Program=3; ^c female = 0, male = 1;

^d Tenure in years; * $p < .01$, ** $p < .05$; scale reliabilities are presented within parentheses along the central diagonal.

Once again, I found consistent results with the Kahneman and Tversky (1979) propositions that individuals are risk avoidant (45% chose program A; 22% chose program B; 33% chose either program; $t(159) = 3.70$, $p < .01$; $t(159) = 1.74$, $p = .08$) when the context was framed as gains and risk takers (18% chose program A; 50% chose program B; 32% chose either program; $t(132) = 4.85$, $p < .01$; $t(132) = 2.34$, $p < .01$) when the situation was framed as losses (see Figures 11 and 12). Similar to Studies 1 and 2, I found that individuals who experienced ambivalence preferred the option “either” more often than individuals in the other conditions ($\chi^2[6]$, $N = 159$, $p < .10$; $\chi^2[6]$, $N = 133$, $p < .01$; gain and loss contextual framing condition, respectively) (see Figures 13 and 14 for graphical representations).

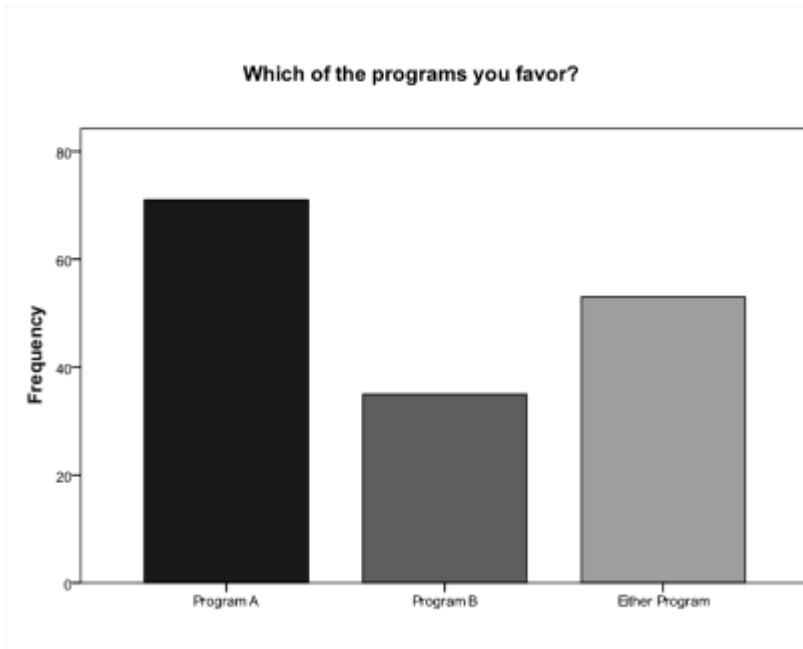


Figure 11: Gain Contextual Framing Condition for Study 3

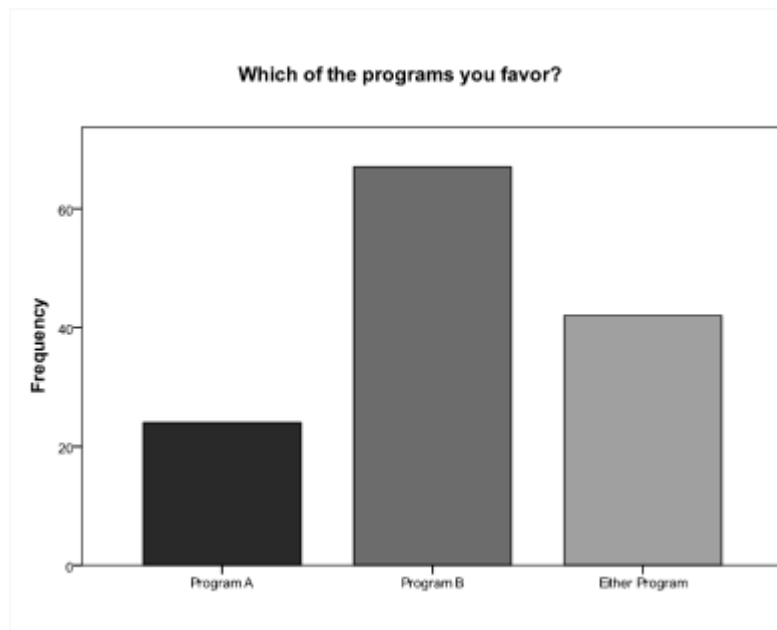


Figure 12: Loss Contextual Framing Condition for Study 3

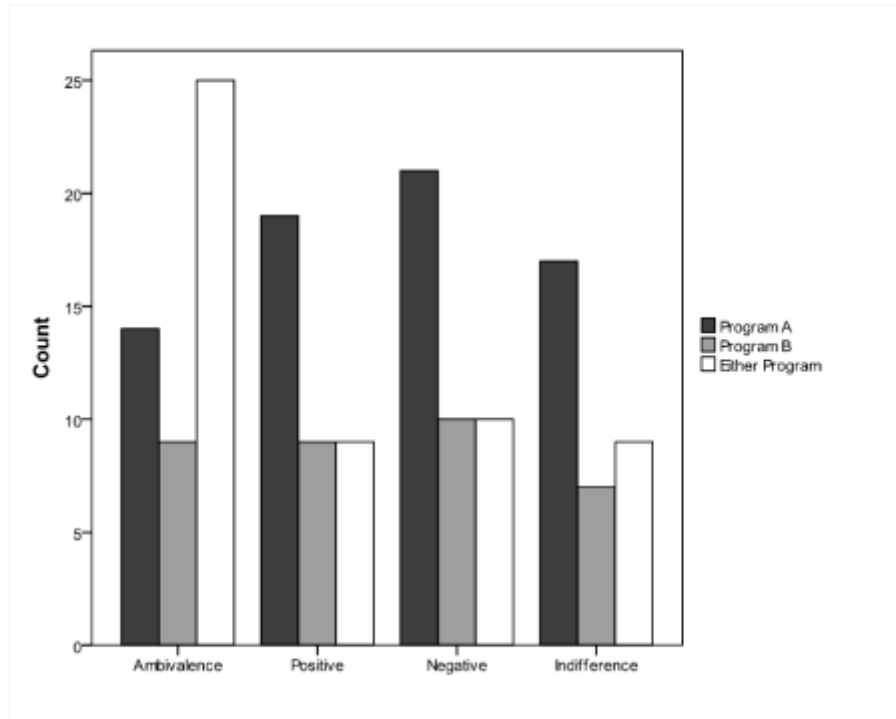


Figure 13: Gain Contextual Framing Condition per Cognitive State Study 3

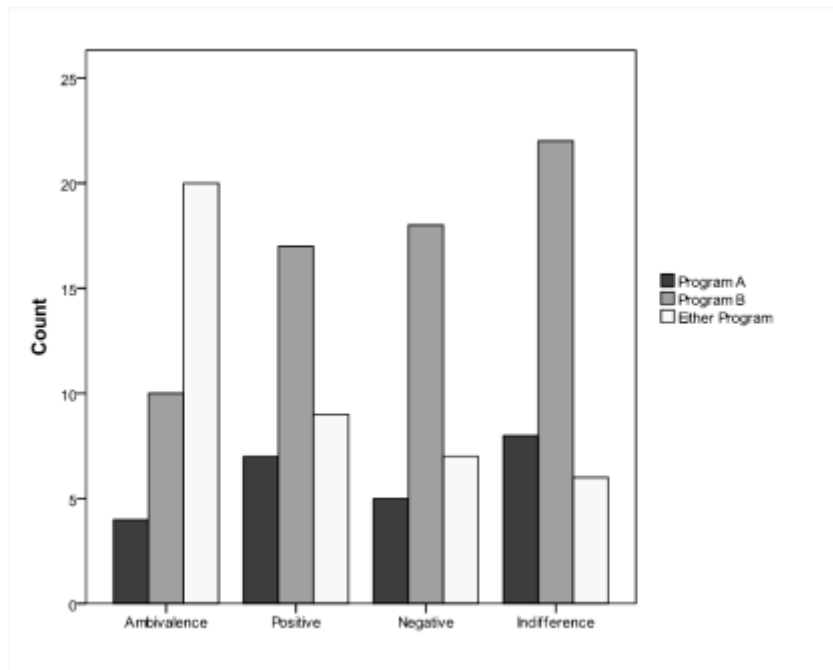


Figure 14. Loss Contextual Framing Condition per Cognitive State for Study 3

I next sought to provide evidence for the mediation hypotheses suggesting that identified ambivalence influences decision effectiveness through contextual awareness and moral awareness. To this end, I conducted a parallel mediation analysis (Hayes, 2013). This approach has two advantages over alternative methods of testing mediation. First, multiple mediating variables can be assessed simultaneously. Second, bootstrapping methods can be used to generate confidence intervals for the total and each indirect effect, which makes any violations of the assumption of normal distributions of scores less problematic.

Results showed that the path from identified ambivalence to contextual awareness was significant ($B = .97, p < .01$), as was the path between identified ambivalence and moral awareness ($B = .44, p < .05$). Contextual awareness ($B = .89, p < .05$), moral awareness ($B = 1.68, p < .01$), and identified ambivalence ($B = 2.15, p < .05$) all predicted decision effectiveness. Bootstrapping procedures using 1,000 resamples revealed significant indirect effects of identified ambivalence on decision effectiveness through contextual awareness (*indirect effect* = .86; 95% CI [.09, 2.48] and moral awareness (*indirect effect* = .74; 95% CI [.03, 1.97]). See Table 6 for the results.

These findings suggest that identified ambivalence influences decision effectiveness through two mechanisms: contextual and moral awareness. Next, I test the hypothesized first-stage moderated mediation model, in which trait self-control and perceptual moral attentiveness moderate the relationship between identified ambivalence and contextual awareness and identified ambivalence and moral awareness, respectively.

Table 6: Regression Results for Parallel Mediation in Study 3^a

	Contextual Awareness			Moral Awareness			Decision		
	B	SE	t	B	SE	t	B	SE	z
Constant	1.87	.76	2.44*	3.54	.47	7.57*	-12.68	3.15	-4.01*
Contextual Awareness							.89	.40	2.48**
Moral Awareness							1.68	.54	3.10*
Identified Ambivalence	.97	.36	2.95*	.44	.20	2.20**	2.15	.84	2.55**
Age	.06	.15	.42	-.11	.09	-1.18	-.35	.39	-.89
Gender^b	-.26	.27	-.97	.07	.16	-.40	-.91	.68	-1.32
Tenure^c	-.01	.02	-.04	.01	.01	1.17	.07	.05	1.39
Contextual Framing Condition	.45	.27	1.70	-.10	.16	-.59	.33	.73	.45
R²		.14			.09				
-2loglikelihood								62.34	
	Bootstrapping Effect			SE			95% CI (LL, UL)		
Direct effect		2.15			.84			.49, 3.80	
Indirect Effect Total		1.60			1.24			.31, .25	
Indirect Effect via Contextual Awareness		.86			.85			.09, 2.48	
Indirect effect via Moral Awareness		.74			.79			.03, 1.97	

^a $N = 82$; ^b female = 0, male = 1; ^c Tenure in years; * $p < .01$, ** $p < .05$; Unstandardized regression coefficients are reported; Bootstrap sample size = 1,000.

Study 4: Identified Ambivalence, Trait Self-Control, and Perceptual Moral Attentiveness

Participants

A total of 298 students at a large U.S. university (150 male; average age of 21.58 years, s.d. = 3.19) took part in this study. These students participated in a short online survey in exchange for course credits. Fifteen participants were deleted from the sample because they completed the task in less than two minutes or failed to complete the whole survey. The final sample size was composed of 283 subjects, and t-tests showed that the final sample did not differ from the original sample in age and gender.

Procedures

Participants were randomly assigned to one of two attitudinal conditions: ambivalence or indifference. Similar to Study 1, participants were asked to write about a past ambivalent or indifferent experience (Fong, 2006; van Harreveld et al., 2012; Schneider et al., 2013). Different from Study 1, there were only two conditions. Since my previous studies have established that this manipulation results in different levels of ambivalence when comparing positive and negative cognitive states, to increase statistical power I used only two conditions: ambivalence or indifference. Next, participants were randomly assigned to one of two contextual framing (gain or loss) conditions (Kahneman & Tversky, 1979). Lastly, participants, who filled out the felt ambivalence and identified ambivalence scales, were asked to participate in a word-fragment completion task and completed other relevant scales: moral awareness, self-control trait, perceptual moral attentiveness, and affective state. On average, participants took 16 minutes to fill out the survey.

Measures

Felt ambivalence. Consistent with the three other studies, I assessed felt ambivalence with the 3-item scale developed by Priester and Petty (1996) (Cronbach's $\alpha = .90$).

Contextual awareness. I measured contextual awareness with the same word fragment completion task used in Study 3.

Moral awareness. I measured moral awareness using the same scale as in Study 3 (Reynolds, 2008) (Cronbach's $\alpha = .81$).

Trait self-control. I asked participants to rate their trait self-control with the 13-item scale developed by Tangney, Baumeister, and Boone (2004) (e.g., "I am good at resisting temptations" and "I say inappropriate things") (Cronbach's $\alpha = .78$).

Perceptual moral attentiveness. Perceptual moral attentiveness was measured with a 7-item scale developed by Reynolds (2008). An example of the items in this scale is: "In a typical day, I face several ethical dilemmas" (Cronbach's $\alpha = .88$).

Identified ambivalence. Identified ambivalence was measured similar to prior studies (Cronbach's $\alpha = .78$).

Controls. The same set of demographic controls was used in this Study (age, gender, tenure, and decision-framing condition). In addition, I controlled for positive (Cronbach's $\alpha = .85$) and negative affective (Cronbach's $\alpha = .89$) states using the 10 items short-form of the Positive and Negative Affect Schedule (PANAS; Thompson, 2007).

Results and Discussion

Table 7 provides the descriptive statistics, reliability levels, and zero-order correlations for Study 4 variables.

Table 7: Descriptive Statistics and Correlations for Study 4 Variables ^a

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Felt Ambivalence	2.49	1.00	(.90)										
2. Identified Ambivalence	1.62	.36	.11	(.78)									
3. Decision ^b	2.02	.82	.30*	.14**									
4. Contextual Awareness	3.14	1.35	.12**	.12	.22**								
5. Moral Awareness	3.30	.83	.15**	.28*	.13**	.15**	(.81)						
6. Trait Self-Control	3.39	.58	-.04	.04	.06	.12**	-.08	(.78)					
7. Perceptual Moral Attentiveness	3.11	1.02	-.05	-.05	-.11	.03	.27*	-.08	(.88)				
8. Positive Emotions	2.68	.90	.10	.14**	-.04	-.03	.08	.06	.03	(.85)			
9. Negative Emotions	1.64	.79	.16*	.08	.11	.04	-.04	-.02	.06	.23**	(.89)		
10. Age	21.58	3.18	-.05	.11	.07	.09	.01	.03	.05	.13**	.01		
11. Gender ^c	.52	.50	-.01	.04	-.01	.11	.08	.10	-.02	-.20*	-.08	-.11	
12. Tenure ^d	3.28	3.57	.01	.13*	.08	.09	.04	.01	.07	.14**	-.01	.80*	-.07

^a $N = 283$; ^b Program A=1, Program B=2, and Either Program=3; ^c female = 0, male = 1; ^d Tenure in years; * $p < .01$, ** $p < .05$; scale reliabilities are presented within parentheses along the central diagonal.

The written recall task successfully created ambivalent states. Analysis of covariance (ANCOVA) with age, gender, tenure, and framing condition as covariates suggested that individuals in the ambivalence condition ($\bar{x} = 2.84, s.d. = 1.09$) reported higher levels of felt ambivalence than individuals in the indifference condition ($\bar{x} = 2.13, s.d. = .76$) during the decision task ($F[1,277] = 39.78, p < .01$).

Similar to prior studies, participants were risk avoidant (46% chose program A; 19% chose program B; 35% chose either program; $t(92) = 3.40, p < .01$) when the situation was framed as gains and risk takers (19% chose program A; 47% chose program B; 34% chose either program; $t(90) = 3.48, p < .01$) when the situation was framed as losses. However, there was not a significant difference between program A and either program ($t(116) = 1.23, p = .22$) when the situation was framed as gains, and program B and either program when the situation was framed as loss ($t(112) = 1.45, p = .15$) (see Figures 15 and 16). In addition, Chi-square analyses showed that individuals experiencing ambivalence selected the option “either” more often than their counterparts experiencing indifference ($\chi^2[2], N = 144, p < .01$; $\chi^2[2], N = 139, p < .01$; gain and loss conditions, respectively) (see Figures 17 and 18).

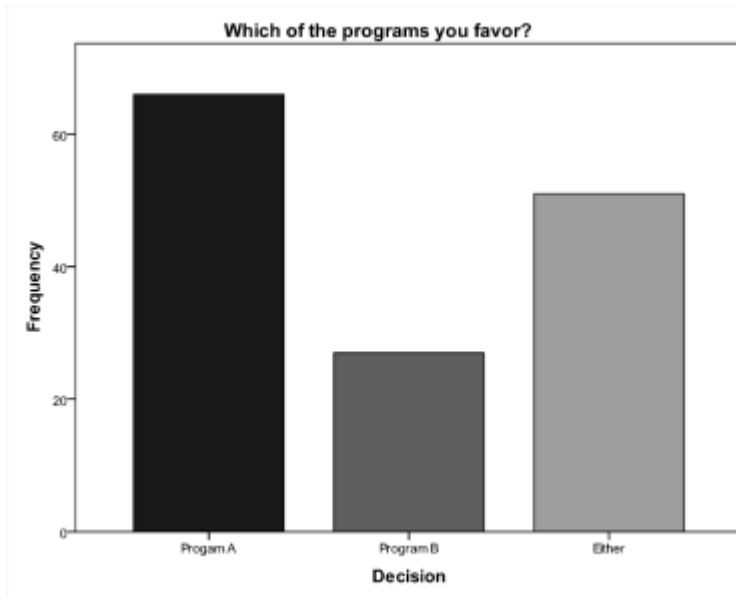


Figure 15: Gain Contextual Framing Condition for Study 4

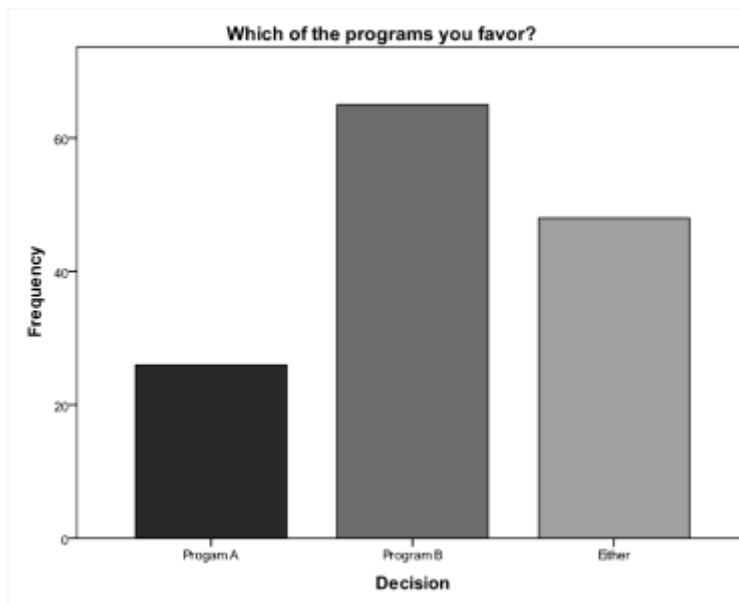


Figure 16: Loss Contextual Framing Condition for Study 4

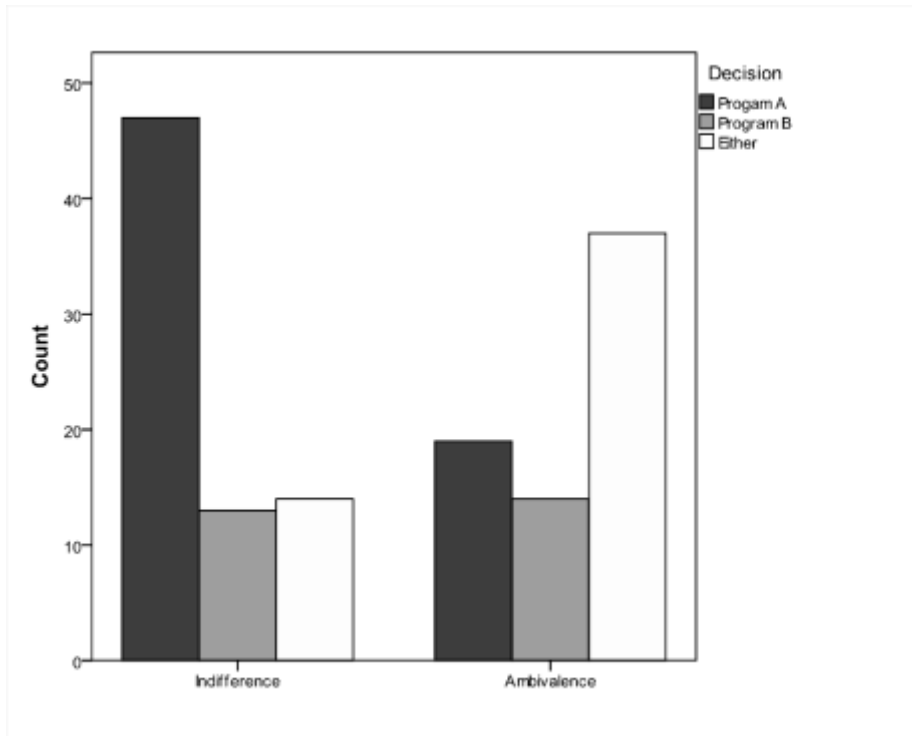


Figure 17. Gain Contextual Framing Condition per Cognitive State Study 4

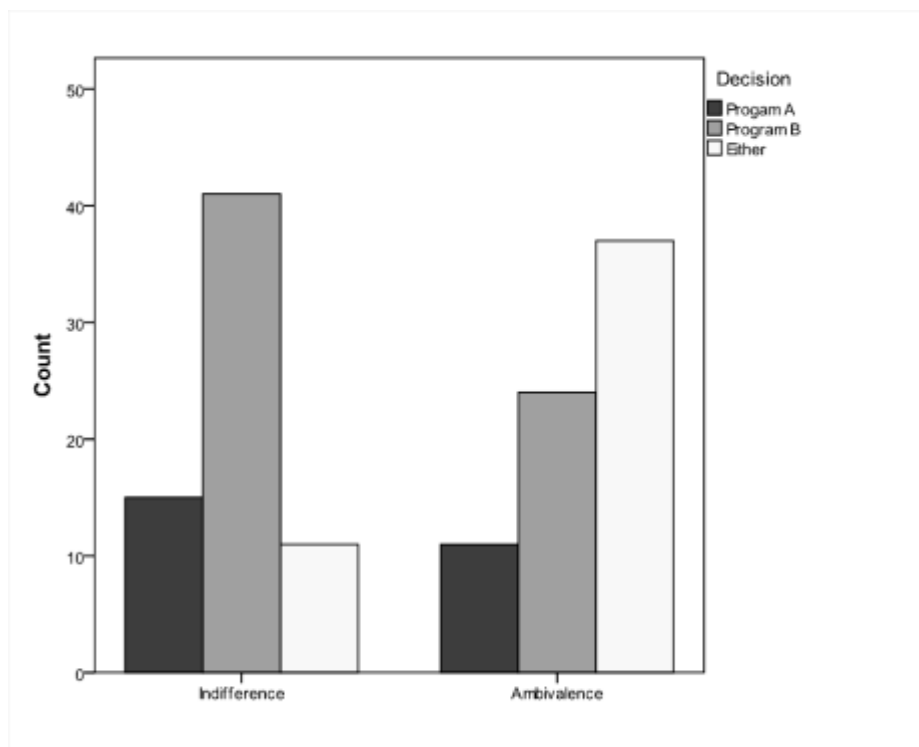


Figure 18. Loss Contextual Framing Condition per Cognitive State for Study 4

To test for Hypothesis 1, I examined the impact of identified ambivalence on decision effectiveness. I collapsed both biased conditions (Program A and B) and created a dichotomous variable. I also controlled for positive and negative affective state, age, gender, tenure, and framing condition. Results of logistic regressions provided further support for Hypothesis 1, suggesting that identified ambivalence had a significant effect on decision effectiveness ($\exp b = 3.41, p < .05$) (see Table 8).

Table 8: Logistic Regression of Identified Ambivalence on Decision for Study 4^a

Variables	Exp(B) ^b	Wald statistics
Age	.95	.36
Gender	.76	.62
Tenure	1.03	.12
Contextual Framing	1.12	.10
Positive Emotions	.75	1.86
Negative Emotions	1.61	2.68
Identified Ambivalence	3.41	4.68**
-2 Log likelihood		186.89

^a $N = 142$; ^bthe entries are exponentiated b 's. Entries above 1.00 indicate positive effects, and entries below 1.00 indicate negative effects; ** $p < .05$

I next sought to replicate the findings for the mediation hypotheses suggesting that identified ambivalence influences decision effectiveness through contextual awareness and moral awareness. Similar to Study 3, I conducted a parallel mediation analysis (Hayes, 2013; Preacher & Hayes, 2008). The path from identified ambivalence to contextual awareness was significant ($B = 1.04, p < .01$) as was the path between identified ambivalence and moral awareness ($B = .73, p < .01$). Contextual awareness ($B = .30, p < .05$) and moral awareness ($B = .53, p < .01$) predicted decision effectiveness. Bootstrapping procedures using 1,000 resamples revealed significant indirect effects of identified ambivalence on decision effectiveness through contextual awareness (*indirect effect* = .32; 95% CI [.03, 1.00] and moral awareness (*indirect effect* = .38; 95% CI [.01, 1.02]). See Table 9 for the results.

Table 9: Regression Results for Parallel Mediation in Study 4^a

	Contextual Awareness			Moral Awareness			Decision		
	B	SE	t	B	SE	t	B	SE	z
Constant	1.31	1.71	.76	3.05	.88	3.44*	-3.14	2.66	-1.18**
Contextual Awareness							.30	.13	2.36**
Moral Awareness							.53	.25	2.14*
Identified Ambivalence	1.04	.40	2.62*	.73	.20	3.57*	.57	.62	.93
Age	.02	.07	.35	-.03	.04	-.76	-.05	.10	-.45
Gender^b	.34	.25	1.33	.24	.13	1.90	-.52	.38	-1.35
Tenure^c	.02	.06	.29	.02	.03	.71	.01	.10	.08
Contextual Framing Condition	-.12	.26	-.44	-.21	.14	-1.56	.32	.40	.81
Positive Emotions	-.18	.14	-1.29	-.05	.07	-.66	-.20	.21	-.93
Negative Emotions	.15	.26	.82	-.03	.10	-.36	.48	.30	1.58
R²		.10**			.14*				
-2loglikelihood								68.28	
		Bootstrapping Effect			SE		95% CI (LL, UL)		
Direct effect		.57			.63		-.64, 1.79		
Indirect Effect Total		.71			.41		.13, 1.58		
Indirect Effect via Contextual Awareness		.32			.24		.03, 1.00		
Indirect effect via Moral Awareness		.39			.28		.01, 1.02		

^a $N = 142$; ^b female = 0, male = 1; ^c Tenure in years; * $p < .01$, ** $p < .05$; Unstandardized regression coefficients are reported; Bootstrap sample size = 1,000.

To test the two hypothesized first-stage moderated mediation model, I began by examining (1) the interactive effect of identified ambivalence and trait self-control on contextual awareness, and (2) the interactive effect of identified ambivalence and perceptual moral attentiveness on moral awareness; thus, these analyses are composed of individuals in the ambivalence condition only. For the hypothesized interaction I grand mean centered the independent variable and moderator (Aiken & West, 1991). I entered all control variables (age, gender, tenure, contextual framing condition, positive affect, and negative affect) and moral awareness in Step 1 of the regression, identified ambivalence and trait self-control in Step 2, and the interaction term in Step 3. Results suggested that the interaction term was significant ($b = -1.29, p < .05$). Simple slope analysis confirmed that results were in the expected direction. When individuals were low in trait self-control (-1s.d.), identified ambivalence significantly predicted higher levels of contextual awareness ($b = 1.76, p < .01$). When individuals were high in trait self-control (+1s.d.), however, identified ambivalence did not influence contextual awareness as the slope did not differ significantly from zero ($b = -.05, p = .93$). To aid interpretation, the interaction effect is plotted in Figure 19.

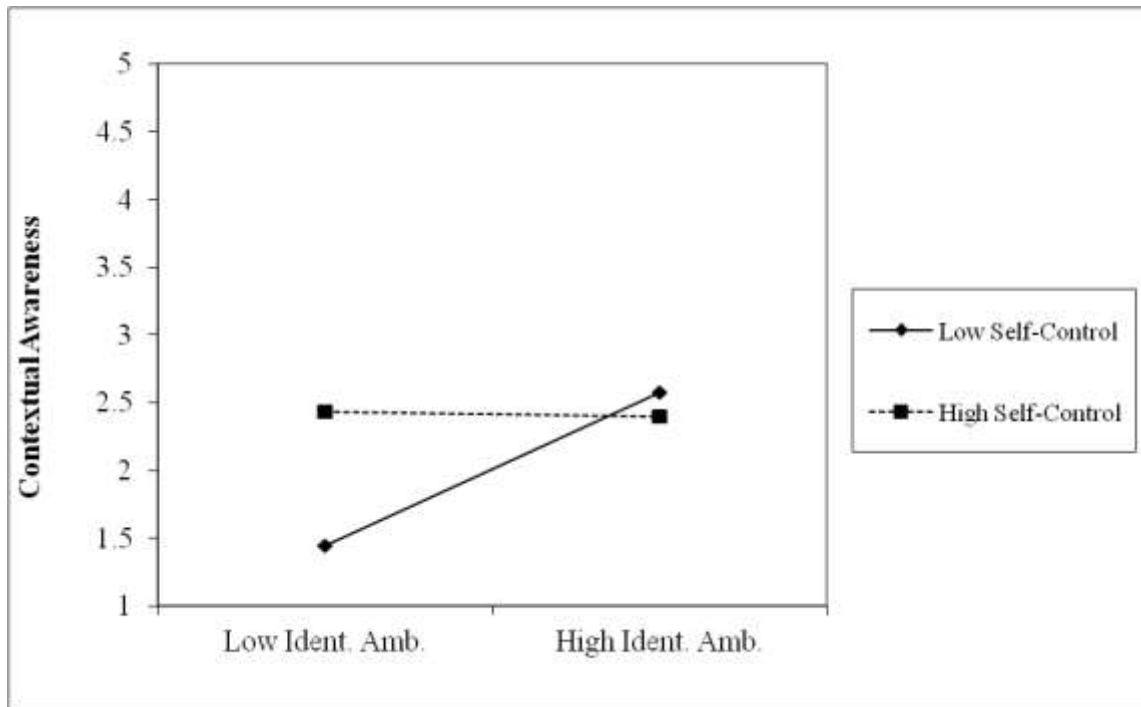


Figure 19: The Interactive Effect of Identified Ambivalence and Trait Self-Control on Contextual Awareness for Study 4

I also used the methods recommended by Hayes (2013) to test for conditional indirect effects at one standard deviation above and below the mean of the moderator (i.e., trait self-control). At one standard deviation below the mean, the mediated moderated model was significant (*indirect effect* = .55, *SE* = .40, 95% *CI* = .02, 1.53). At one standard deviation above the mean, however, the mediated model was not significant (*indirect effect* = -.02, *SE* = .27, 95% *CI* = -.65, .47) (see Table 10). Together, the results suggest that identified ambivalence is more likely to influence decision effectiveness through contextual awareness when individuals are low in trait self-control.

Table 10: Regression Results for Conditional Indirect Effect through Contextual Awareness in Study 4^a

Dependent Variable	Contextual Awareness			Contextual Awareness			Contextual Awareness			Decision Effectiveness		
	Step 1			Step 2			Step 3			Step 4		
	B	SE	t	B	SE	t	B	SE	t	B	SE	z
Constant	1.93	1.74	1.11	2.61	1.71	1.53	2.21	1.70	1.30	-2.21	2.54	-.87
Identified Ambivalence				.89	.41	2.17**	.85	.40	2.10**	.58	.62	.92
Trait Self-Control				.36	.18	2.04**	.28	.18	1.61			
Contextual Awareness										.30	.13	2.36**
Int. FA and Self-Control							-1.29	.60	-2.11**			
Age	.02	.07	.30	.01	.07	.16	.03	.07	.50	-.05	.09	-.45
Gender ^b	.30	.26	1.15	.25	.26	.99	.29	.25	1.16	-.52	.38	-1.35
Tenure ^c	.03	.06	.47	.03	.06	.47	.01	.06	.16	.01	.09	.08
Contextual Framing												
Condition												
Positive Emotions												
Negative Emotions												
Moral Awareness												
R ²												
-2loglikelihood												
												174.67
	Bootstrapping Indirect Effect			SE			95% CI (LL, UL)					
Moderator: Self-Control												
-1SD (-.71)	.55			.40			.02, 1.53					
Mean (0)	.26			.24			-.03, .84					
+1SD (.71)	-.02			.27			-.65, .47					

^a $N = 142$; ^b female = 0, male = 1; ^c Tenure in years; * $p < .01$, ** $p < .05$; Unstandardized regression coefficients are reported; Bootstrap sample size = 1,000.

I used a similar approach to test for the second hypothesized interaction. Results suggested that the interaction between identified ambivalence and perceptual moral attentiveness was significant ($b = -.43, p < .05$). Simple slope analysis confirmed that results were in the expected direction. When individuals were low in perceptual moral attentiveness ($-1s.d.$), identified ambivalence significantly predicted higher levels of contextual awareness ($b = 1.27, p < .01$). When individuals were high in perceptual moral attentiveness ($+1s.d.$), however, identified ambivalence did not influence moral awareness since the slope did not differ significantly from zero ($b = .36, p = .20$). To aid interpretation, the interaction effect is plotted in Figure 20.

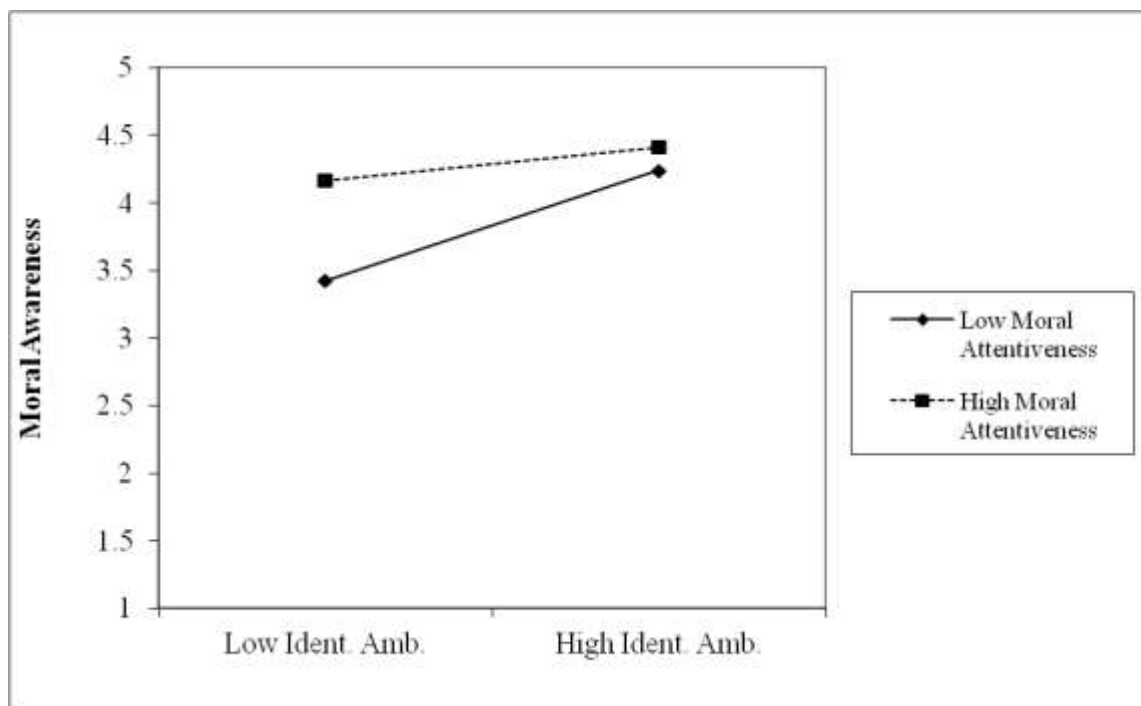


Figure 20. The Interactive Effect of Identified Ambivalence and Perceptual Moral Attentiveness on Moral Awareness for Study 4

Finally, I adopted Hayes (2013) methodology to test for conditional indirect effects of identified ambivalence on decision effectiveness through moral awareness at one standard

deviation above and below the mean of perceptual moral attentiveness. At one standard deviation below the mean, the mediated moderated model was significant (*indirect effect* = .69, *SE* = .53, 95% CI = .03, 2.00). At one standard deviation above the mean, however, the mediated model was not significant (*indirect effect* = .20, *SE* = .16, 95% CI = -.03, .63) (see Table 11). Together, the results suggest that identified ambivalence is more likely to influence decision effectiveness through moral awareness when individuals are low in perceptual moral attentiveness.

Table 11: Regression Results for Conditional Indirect Effect through Moral Awareness in Study 4^a

Dependent Variable	Moral Awareness			Moral Awareness			Moral Awareness			Decision Effectiveness		
	Step 1			Step 2			Step 3			Step 4		
	B	SE	t	B	SE	t	B	SE	t	B	SE	z
Constant	4.10	.85	4.82*	3.97	.79	5.07*	4.06	.77	5.26*	-2.21	2.54	-.87
Identified Ambivalence				.81	.20	3.99*	.83	.20	4.15*	.58	.62	.93
Perc. Moral Attentiveness				.23	.06	3.78*	.22	.06	3.74*			
Moral Awareness										.54	.25	2.14**
Int. FA and Perc. Moral Attentiveness							-.43	.18	-2.33**			
Age	-.04	.04	-1.00	-.02	.03	-.72	-.02	.03	-.66	-.04	.10	-.45
Gender ^b	.25	.14	1.82	.21	.13	1.65	.16	.13	1.29	-.52	.38	-1.35
Tenure ^c	.04	.03	1.06	.01	.03	.32	.01	.03	.31	.01	.09	.08
Contextual Framing Condition	-.25	.14	-1.78	-.11	.13	-.85	-.16	.13	-1.20	.32	.39	.80
Positive Emotions	-.01	.08	-.17	-.05	.07	-.64	-.04	.07	-.64	-.20	.22	-.93
Negative Emotions	-.03	.10	-.28	-.06	.09	-.54	-.09	.09	-.96	.48	.30	1.58
Contextual Awareness	.08	.05	1.71	.04	.04	1.04	.04	.04	1.03	.31	.13	2.36**
R ²		.08*			.23*			.27*				
-2loglikelihood												174.68

	Bootstrapping Indirect Effect	SE	95% CI (LL, UL)
Moderator: Perc. Moral Attentiveness			
-1SD (-1.04)	.69	.53	.03; 2.00
Mean (0)	.45	.31	.05; 1.19
+1SD (1.04)	.20	.16	-.03; .63

^a $N = 142$; ^b female = 0, male = 1; ^c Tenure in years; * $p < .01$, ** $p < .05$, † $p < .10$; Unstandardized regression coefficients are reported; Bootstrap sample size = 1,000.

General Discussion

In this chapter, I proposed that when individuals identify the sources of their ambivalence, they engage in deliberative cognitive processing that results in functional outcomes. I conducted four studies that provide insight into the pathways and boundary conditions that underlie the positive effects of identified ambivalence on decision effectiveness. Specifically, I demonstrated that individuals who experience identified ambivalence are less vulnerable to cognitive biases (i.e., framing effects). Contextual awareness and moral awareness are mechanisms through which identified ambivalence can influence decision effectiveness. Moreover, the relationships between identified ambivalence and these mechanisms are particularly strong at low levels of trait self-control and perceptual moral attentiveness. In the following sections, I discuss the theoretical and practical implications of this research.

Theoretical Implications

My research advances the current understanding of ambivalence theory (Ashforth et al., 2014; Baek, 2010; Gilbert, 2006; Plambeck & Weber, 2009; Priester & Petty, 2001) by theoretically developing and empirically testing to role of identified ambivalence on decision effectiveness. Answering the calls for investigating the functional outcomes of ambivalence (Ashforth et al., 2014), the results shed light on how identifying the cause of ambivalent states can help minimize the effects of cognitive biases on decisions. Specifically, experiencing identified ambivalence creates an enhanced level of awareness, which can thwart heuristic impulses when making decisions. My findings suggest that identified ambivalence triggers functional mechanisms in which individuals become aware of the contrasting relevant contextual and moral cues before making decisions.

This research also contributes to the understanding of ethical decision making (e.g., Reynolds, 2008; Trevino, 1986) by highlighting the influence of cognitive states on ethical behavior. Researchers have identified stable individual differences (e.g., moral identity, Reed & Aquino, 2002), stages of moral reasoning (e.g., Kohlberg, 1981), moral motivation (e.g., Rest, 1986), and ego resources (Gino, et al., 2011) as predictors of ethical behavior. I built on this prior work and investigated how and when a specific cognitive state (i.e., identified ambivalence), influences the awareness of the ethical implications of individuals' decisions. The studies demonstrated that individuals who experience identified ambivalence become more aware of moral issues, especially when their predisposition is not to see morality in every aspect of their lives. Ultimately, research on identified ambivalence could help elucidate how managers can broaden organizations' circle of moral regard for its stakeholders, generating and maintaining positive cycles of moral behavior (Hernandez, 2012), in complex organizational contexts.

More broadly, this research advances the current understanding of contextual interpretation (e.g., mindfulness; Brown et al., 2007), offering an explanation to when and how individuals with limited cognitive resources and vulnerable to cognitive biases can thrive in complex situations. Researchers have suggested that mindfulness is a property of conscientiousness that influences attention and awareness (Brown et al., 2007; Olendzki, 2005); however, little is known about when individuals engage in mindful processes. This Chapter suggests that individuals experiencing identified ambivalence pay attention to opposite cues and can become more fully aware of the situation prior to making a decision if they can identify the cause of their ambivalent state. Given that identified ambivalence can facilitate individuals' ability to channel their limited cognitive resources to process relevant contextual information, identified ambivalence could create the psychological conditions for mindfulness to occur.

Finally, this research offers unique insights into the study of double-loop learning (Argyris, 1976). Scholars have suggested that learning involves the detection and correction of error (Argyris & Schon, 1978); nevertheless, it is often difficult for individuals to stop their automatic responses and search broadly for contextual interpretations when attempting to detect and correct errors (e.g., single-loop learning; Argyris, 1976). As compared to single-loop learning, double-loop learning involves questioning the role of the established processes and systems (Usher & Bryant, 1989: 87). Considering identified ambivalence prompts individuals to search for and integrate a variety of interrelated and relevant issues into their contextual analyses, and such a state could facilitate double-loop learning. Individuals experiencing identified ambivalence, for example, might be more likely to question established organizational practices. As such, identified ambivalence could explain when individuals engage in double-loop learning by detecting and correcting dysfunctional systems.

Practical Implications

My findings suggest identified ambivalence can be especially helpful for organizational newcomers. Newcomers often try to reduce uncertainty (Berger, 1979) by seeking information during their organizational entry period. Indeed, past researchers have noted the importance of socialization in shaping employees' attitudes and behaviors (e.g., Allen & Meyer, 1990). Considering the powerful effect that preexisting cognitive structures on leadership and followership can have on the development of interpersonal relationships, organizations can facilitate the development of "cognitive maps" (Jones, 1983) that deemphasize existing biases. By encouraging identified ambivalence states through socialization processes (Bauer, Bodner, Erdogan, Truxillo, & Tcker, 2007), managers can highlight the importance of building awareness around different contextual and moral factors related to every day decision-making situations.

Additionally, the theory of identified ambivalence suggests that individuals achieve effective decisions when they integrate opposite and conflicting information. Organizations should thus provide opportunities for followers to seek opinions and different perspectives beyond traditional sources (e.g., leaders and mentors) and consider peers and other internal as well as external organizational stakeholders. Organizations could develop contexts that support identified ambivalence by encouraging followers to broaden their developmental networks and seek ideas from multiple sources, rather than limit themselves to the opinions of their leaders. Stimulating employees to participate in learning communities that span organizational boundaries, for example, could facilitate the exchange of valuable information, thus exposing followers to contrasting perspectives, and fostering their understanding of the potential causes of their ambivalence.

Limitations and Future Directions

Across four studies, which provided consistent evidence for the link between identified ambivalence and decision effectiveness via contextual and moral awareness, there are several limitations that offer opportunities for future development. First, I operationalized decision effectiveness, in all studies, as decisions that were not influenced by Kahneman and Tversky's (1979) framing effect. The framing effect is a well-established and pervasive cognitive bias that is difficult to overcome (Kahneman, 2011); nevertheless, different cognitive biases can have specific automatic mechanisms in which identified ambivalence could have varied effects or influence decisions through different mechanisms. Future research should investigate the effects of identified ambivalence on other cognitive biases (e.g., congruence bias, information bias, status-quo bias).

Second, I used scenarios across all four studies to test the hypotheses. Although I adopted a validated scenario and used working adults to test our hypotheses, this methodological approach limits the external validity of the findings. Using a controlled laboratory setting in which I provided the same scenario to all participants to test the model allowed me to manipulate the participants' cognitive state by randomly assigning them to one of the attitudinal conditions while keeping the decision constant across all participants. In addition, I adopted two different attitudinal manipulations. These procedures allowed us to triangulate the results across the studies. Future work using different scenarios and field studies may advance the understanding of the association between identified ambivalence and decision-making processes in organizations.

Third, a potential fruitful direction for future research involves identifying other boundary conditions, beyond trait self-control and perceptual moral attentiveness, for the relationship between identified ambivalence and contextual awareness. In the studies, I demonstrated that the effects of identified ambivalence on contextual awareness are stronger when trait self-control is low. Other personality differences and contextual factors, such as need for cognition (Cacioppo & Petty, 1982) and time availability to process information, could moderate this relationship. I also showed that the effects of identified ambivalence on moral awareness are stronger when individuals are low in perceptual moral attentiveness. The extent to which morality is central to the individual self-definition (moral identity; Aquino & Reed, 2002) could also influence the strength of the moral path to effective decisions.

Finally, I did not integrate state self-control in the studies. Although I randomly assigned participants to different conditions, which controls for different levels of state self-control, future studies could manipulate participants' self-control and test for its effects on identified

ambivalence. Considering that individuals with low levels of state self-control have less attentional resource to process contextual information (Hagger, Wood, Stiff, & Chatzisarantis, 2010), they may be less likely to experience identified ambivalence and benefit from its functional outcomes.

Conclusion

Given the increased complexity, speed, and interdependencies in organizations, the potential for ambivalence is omnipresent. Understanding how and when cognitive conflicts can lead to functional outcomes rather than the dysfunctional pitfalls of heuristic processing translates to knowing how to effectively tackle key decision-making turning points. My findings have demonstrated that individuals who are able to identify the source of their ambivalent state make more effective decisions because they are aware of the situational complexities and social consequences of their actions. As such, identified ambivalence has the potential to counteract the negative consequences of cognitive conflicts by overcoming cognitive traps.

In the first two chapters, I investigated the functional outcomes of ambivalence on contextual interpretation (Chapter 1) and decision-making processes (Chapter 2). I started by presenting a theoretical model of ambivalence at the dyadic level of analysis. Chapter 1, thus, focused on shared ambivalence between leaders and followers that can result in joint contextual interpretation. In Chapter 2, I adopted an individual level of analysis to explain why, how, and when ambivalence can lead to effective decisions. In four studies I found that identified ambivalence influenced decision effectiveness via contextual and moral awareness and that these paths were stronger when individuals were low in trait self-control and perceptual moral attentiveness. Next, I propose potential future directions for identified ambivalence. In Chapter 3, I draw on the shared information model (e.g., Stasser & Steward, 1992) and social network

theory (e.g., Borgatti, Everett, & Johnson, 2013) to propose research on the effects of identified ambivalence on group dynamics and group decisions. Finally, I focus on organizational structures and call for research on the relationship between information and process structures, and identified ambivalence.

Chapter 3 - Looking Ahead: Potential Avenues for Identified Ambivalence

Consistent with the theory I developed in Chapter 1 and the theory and empirical results I presented in Chapter 2, there is evidence to support the proposition that ambivalence can help individuals overcome cognitive traps. In Chapter 1, I suggested that leader-follower shared ambivalence can provide the cognitive fluidity for collaborative interpretations of complex contexts. Shared ambivalence, thus, can minimize the influence of leaders' and followers' own cognitive biases leading to a thorough assessment of relevant contextual information. In Chapter 2, I suggested identified ambivalence is a key cognitive state that minimizes the effects of heuristics in decision-making processes. Identified ambivalence was positively related to individual's contextual and moral awareness, which, in turn, led to effective decision-making. Considering the propositions and findings of these two chapters, one potential avenue for future research is to broaden the level of analysis to groups and investigate the effects of identified ambivalence on group dynamics and outcomes. Specifically, can identified ambivalence result in effective decisions in groups by increasing the bandwidth of shared information among group members? Another potential future direction is to investigate the influence of organizational structure on identified ambivalence. In particular, can information structures and process structures influence the magnitude of contextual complexity on identified ambivalence?

The Role of Identified Ambivalence in Group Dynamics and Outcomes

Information sharing is a crucial process in group decision-making. Critical decisions are often made by groups of heterogeneous people that supposedly provide different perspectives (Hollenbeck, Ilgen, Segoe, Hedlund, Major, & Phillips, 1995). However, research has consistently shown that group members primarily discuss the information already known by all members

(e.g., Stasser & Steward, 1992). Critical unshared information is rarely discussed suggesting that individuals have information bias (shared information focus) or preferential bias (initial preferred alternative). Although researchers have focused on the underlying motivational processes (e.g., Steinel, Utz, & Koning, 2010) of biased information processing, little is known about the psychological state of individuals who enter the group when making decisions.

In Chapter 1, I proposed that leader-follower shared ambivalence provides the cognitive fluidity for leaders and followers to jointly expand their interpretative boundaries and deepen their analysis by integrating different contextual information. In Chapter 2, I suggested that individuals experiencing identified ambivalence engage in deeper cognitive processing to investigate the causes of their ambivalence. Consistent with these two chapters, individuals experiencing identified ambivalence can proactively search for information that is hidden among group members. As such, critical unshared information can be brought to group discussions and integrated before the group reaches a decision. Identified ambivalence, then, can minimize the effects of informational bias on group decisions. Moreover, individuals experiencing identified ambivalence do not have an initial preference. Given these individuals have strong opposite evaluations about the situation, they are less likely to experience preferential bias and can share balanced information during the evaluative process. Future research should thus, focus on how identified ambivalence can minimize the effects of information bias and preferential bias in group decision making processes.

In addition, the group's social structure can influence the information flow among all group members. Social network theory suggests that centrality is an important individual characteristic that influences the information flow within the network (Borgatti, Everett, & Johnson, 2013). Although there are different ways to measure centrality capturing different

aspects of the network, I focus on degree centrality—the connectedness of the individual in the network—because highly central individuals have more opportunity to diffuse their information. Future research should investigate if assigning ambivalent individuals as leaders will result in more effective decisions than assigning multiple ambivalent followers and a non-ambivalent leader. In addition, future research should also investigate if non-ambivalent or ambivalent individuals emerge as leaders by measuring group member centrality after their initial interactions. By adopting a longitudinal design, researchers can also investigate if ambivalent leaders achieve better performance than non-ambivalent leaders over time.

Identified Ambivalence and Organizational Structure

In Chapter 1, I proposed situational complexity can induce ambivalence in leaders and followers. I described that uncertainty about the options available within the environment and dualities have the potential to trigger ambivalence. Contextual factors can change not only the strength but also the direction of relationships (Mowday & Sutton, 1993). Staw (1985) argued that the proximity between independent and dependent variables can explain key counterintuitive findings in organizational behavior. Although uncertainty and dualities can activate identified ambivalence, they are distal factors. Future researchers should investigate if organizational structure provides the proximal features that allow complex contexts to activate identified ambivalence in leaders and followers. For instance, researchers should investigate if information structures, or formal procedures by which the information required for organizational functioning is processed (Wallace, 1968), augments or diminishes the effect of contextual complexity on identified ambivalence. Similarly, researchers should examine the effects of process structures, or guidelines for coordinating the pace of effort (McGrath, 1991), on the relationship between contextual complexity on identified ambivalence.

Information flow in organizations influences how individuals behave and make decisions (Knight & McDaniel, 1979). Numerous studies have shown that, as structural complexity increases, so does the probability that the information being transmitted will be distorted or biased (Aldrich, 1979; Rousseau, 1978). Future research should investigate if individuals in organizations that provide balanced information through formal channels experience higher levels of identified ambivalence in comparison to individuals in organizations that provide one-sided information.

Moreover, workflow also affects how individuals behave and make decisions (Bunderson, 2003). Research has suggested that individuals in organic structures, or structures characterized by a lack of formally defined tasks and an emphasis on horizontal as opposed to vertical coordination (Burns & Stalker, 1961), tend to be more flexible, taking into consideration a broader set of contextual characteristics when making decisions (Levinthal & March, 1993). Eisenhardt and Tabrizi (1995) found that organizations with organic structures perform better than organizations with mechanistic structures especially in turbulent markets. Building on these past findings, future research should investigate if the effects of complex contexts on identified ambivalence are stronger when organizations have organic structures than when organizations have mechanistic structures.

Finally, structures that incentivize counterfactual thinking (Roese, 1994; 1997) can also enhance the effects of contextual complexity on identified ambivalence. Counterfactual thinking is defined as “might-have-been” reconstructions of past outcomes (Roese, 1994) and it serves an affective function (feeling better) and a preparative function (future improvement). It is possible that organizations that encourage leaders and followers to imagine alternative versions of actual events could augment the effects of complex contexts on identified ambivalence.

General Conclusion

This dissertation has explored cognitive processes at the intersection of contextual complexity, ambivalence, and interpretative outcomes. Individuals have limited cognitive resources and are vulnerable to cognitive biases, which can result in dysfunctional interpretative processes. In Chapter 1, I theorized about situationally induced ambivalence in leadership processes. I explained leader-follower shared ambivalence can trigger constructive cognitive conflicts that facilitate joint contextual interpretation. In Chapter 2, I focused on identified ambivalence. The results suggest that identified ambivalence influences decision effectiveness. In addition, this chapter provided support for the importance of contextual awareness and moral awareness as mediators, and trait self-control and perceptual moral attentiveness as moderators of the relationship between ambivalence and decision effectiveness. In Chapter 3, I concluded my dissertation by presenting potential future directions for identified ambivalence. I hope this dissertation stimulates further examination of the processes and effects identified ambivalence can have on contextual interpretation and decision-making processes.

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Appendix A

Framing Exercise

Gain Frame:

Imagine that the U.S. is preparing for the outbreak of an unusual disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved. If Program B is adopted, there is $1/3$ probability that 600 people will be saved, and $2/3$ probability that no people will be saved. Which of the two programs would you favor?

- Program A
- Program B
- Either Program

Loss Frame:

Imagine that the U.S. is preparing for the outbreak of an unusual disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

If Program A is adopted 400 people will die. If Program B is adopted there is $1/3$ probability that nobody will die, and $2/3$ probability that 600 people will die. Which of the two programs would you favor?

- Program A
- Program B
- Either Program

Appendix B

Genetically Modified Food Manipulation

Ambivalence condition

Instructions: Please read the following news story. After you finish reading the story, you will be asked to accurately recall its main arguments.

Title: The pros and cons of genetic engineering

There is a revolution in the field of food production. New insights in genetics make it possible to grow genetically modified organisms (GMO). However, the debate about the effects of genetic engineering to agriculture, the environment and health of people is just beginning. Some see huge benefits in offering genetically modified food; others feel that this technology is associated with numerous risks. The Consumer and Gene Technology Committee organized a recent debate on GMO and summarized the discussion as follows. The main **advantages** of growing GMO crops include (1) an increase in the world food production. The Food and Drug Administration (FDA) reported that the global price of soybeans and corn would be 10% higher without GMO crops. (2) Genetic modification also makes crops less vulnerable to diseases and pests. Put simply, fewer pesticides make our food safer. (3) Another benefit, especially for developing countries, is the possibility to grow more nutritious varieties of commonly consumed grains. (4) The technology used to create genetically modified food can also be used to replace current inoculation methods in vaccination, which makes vaccines cheaper and more accessible to poor countries. (5) Finally, farmers can grow products that have a longer shelf-life and keep a fresher look. The main **disadvantages** of growing GMO crops include (1) the uncertainty related to the consequences of eating genetically modified food. (2) GMO crops can also have effects on the wild animals that eat them. It was found that the pollen from genetically modified corn led to high mortality of butterflies. (3) There are also indications that genetic modification can lead to new substances that cause allergies with no known treatment. (4) Another risk is that GMO crops can reduce biodiversity. (5) Finally, the development of new GMO crops is very costly and makes the developing countries even more dependent on the rich West. In short, there is much disagreement on genetically modified organisms and the debates, such as the one organized by the Consumer and Gene Technology Committee, will likely continue.

Source:

<http://www.fda.gov>
<http://borgenproject.org>

Without going back to the news story, please select the statements that accurately describe the main arguments in it. You may select all, some or none statements.

- a) Genetic modified food tastes better than regular food. (positive but not in the article)

- b) Genetic modified food labeling is not clear to consumers and cause confusion. (negative but not in the article)
- c) GMO can increase the world food production. (positive and in the article)
- d) GMO can lead to new substances that cause allergies with no known treatment. (negative and in the article)

Positive condition

Instructions: Please read the following news story. After you finish reading the story, you will be asked to recall its main arguments.

Title: The beneficial conclusions of genetic engineering

There is a revolution in the field of food production. New insights in genetics make it possible to grow genetically modified organisms (GMO). This technology has many benefits for society. The Consumer and Gene Technology Committee organized a recent debate and summarized the encouraging findings as follows. The main advantages of growing GMO crops include (1) an increase in the world food production. The Food and Drug Administration (FDA) reported that the global price of soybeans and corn would be 10% higher without GMO crops. (2) Genetic modification also makes crops less vulnerable to diseases and pests. Put simply, fewer pesticides make our food safer. (3) Another benefit, especially for developing countries, is the possibility to grow more nutritious varieties of commonly consumed grains. (4) The technology used to create genetically modified food can also be used to replace current inoculation methods in vaccination, which makes vaccines cheaper and more accessible to poor countries. (5) Finally, farmers can grow products that have a longer shelf-life and keep a fresher look. In short, it seems there is an agreement on the benefits of genetically modified organisms. Conclusions, such as the ones presented by the Consumer and Gene Technology Committee, will likely continue to support its societal benefits.

Source:

<http://www.fda.gov>
<http://borgenproject.org>

Without going back to the news story, please select the statements that accurately describe the main arguments in it. You may select all, some or none statements.

- a) Genetic modified food tastes better than regular food. (positive but not in the article)
- b) GMO can increase in the world food production. (positive and in the article)
- c) GMO crops provide nutritious food especially for developing countries. (positive and in the article)

Negative condition

Instructions: Please read the following news story. After you finish reading the story, you will be asked to recall its main arguments.

Title: The unfavorable conclusions of genetic engineering

There is a revolution in the field of food production. New insights in genetics make it possible to grow genetically modified organisms (GMO). This technology has many risks for society. The Consumer and Gene Technology Committee organized a recent debate and summarized the discouraging findings as follows. The main disadvantages of growing GMO crops include (1) the uncertainty related to the consequences of eating genetically modified food. (2) GMO crops can also have effects on the wild animals that eat them. It was found that the pollen from genetically modified corn led to high mortality of butterflies. (3) There are also indications that genetic modification can lead to new substances that cause allergies with no known treatment. (4) Another risk is that GMO crops can reduce biodiversity. (5) Finally, the development of new GMO crops is very costly and makes the developing countries even more dependent on the rich West. In short, it seems there is an agreement on the risks of genetically modified organisms. Conclusions, such as the ones presented by the Consumer and Gene Technology Committee, will likely continue to support its societal harm.

Source:

<http://www.fda.gov>
<http://borgenproject.org>

Without going back to the news story, please select the statements that accurately describe the main arguments in it. You may select all, some or none statements.

- a) Genetic modified food labeling is not clear to consumers and cause confusion. (negative but not in the article)
- b) GMO can lead to new substances that cause allergies with no known treatment. (negative and in the article)
- c) GMO reduce biodiversity. (negative and in the article)

Control condition

Instructions: Please read the following news story. After you finish reading the story, you will be asked to recall its main arguments.

Title: Has Russian math whiz solved &1M puzzle?

A reclusive Russian mathematician may have solved one of the world's toughest mathematics problems and stands to win \$1 million -- but he doesn't appear to care. Grigori Perelman from St. Petersburg claims to have solved the extremely complicated Poincare Conjecture that tries to explain the behavior of multi-dimensional shapes in space, thereby making himself eligible for the prize offered by the Massachusetts-based Clay Mathematics Institute. But there's a snag. He has simply posted his results on the Internet and left his peers to work out for themselves whether he is right -- something they are still struggling to do. "There is good reason to believe that Perelman's approach is correct. But the trouble is, he won't talk to anybody about it and has shown no interest in the money," said Keith Devlin, Professor of Mathematics at Stanford University in California. "There won't be a golden moment when he is suddenly accepted as being right. There will just be a drift in that direction," he told the annual meeting of the British Association for the Advancement of Science.

Without going back to the news story, please select the statements that accurately describe the main arguments in it. You may select all, some or none statements.

- a) Poincare Conjecture explains the behavior of multi-dimensional shapes in space.
- b) Grigori Perelman is from the Netherlands.
- c) Grigori Perelman posted the results on the Internet to check if they were right.

Appendix C

Word Completion Exercise

Instructions: Please complete the following 15 word fragments. Please work quickly; spend no more than 15 seconds on each item.

(1) CO__ __EE

(2) __ EALTH

(3) CL__C__

(4) M__ __ TALITY

(5) __ON__AY

(6) TR__ __

(7) __ __ FECTION

(8) L__WN

(9) PIL__

(10) __ __ OR

(11) SAL__D

(12) CU__ E

(13) __OUS__

(14) DEA__ __

(15) C__ ALK

(*) The 6 words in red are decision-related words. The remaining words are neutral fillers.