

**UNDERSTANDING AND IMPROVING PERSONAL RISK MANAGEMENT:
NEW PERSPECTIVES ON PERSONAL POLICY DECISIONS
AND AN ILLUSTRATION—THE CASE OF SEATBELTS**

by

Laith Alattar

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Psychology)
in The University of Michigan
2011

Doctoral Committee:

Professor J. Frank Yates, Chair
Professor Phoebe C. Ellsworth
Professor Colleen M. Seifert
Associate Professor Penny F. Pierce
Research Scientist David W. Eby

ACKNOWLEDGMENTS

First, I extend my deepest respect and gratitude to Frank Yates, my advisor, mentor, and committee chair. His support, guidance, and integrity are solid, gentle, and pure. I have learned from him the art of thought, inquiry, and writing; the craft of being thorough and concise at once; the humbling talent of time and task management; and finally: the science of decision making.

I thank my committee for their support and guidance in preparing and defending my dissertation. I thank Colleen Seifert for her support and being instrumental in getting my dissertation underway. Her positive attitude will forever shape my future research. I thank Phoebe Ellsworth for being so supportive of my long years of graduate training. I also admire her and look up to her in so many ways. I thank Penny Pierce, for her insight and care, both personal and professional. I also appreciate her support in spite of being thousands of miles away and many time zone hours ahead of Ann Arbor in the weeks leading to my defense. I thank David Eby, not only for overseeing my dissertation but also the months of mentorship in helping me adapt and polish my research skills to new and challenging settings in field research on traffic safety.

I extend my deep respect and gratitude to Dick Nisbett. I thank him first for supporting my graduate education, and second, for inspiring my interest in culture research. Dick and Frank were both instrumental in my decision to pursue graduate education in psychology. Their *Geography of Thought* and *Decision Management* have forever shaped my career. Both have become *my* domains. Dick's presence guides me, even from afar. I wished to have him on my committee, and though that did not happen, I believe that my relationship with culture and cognition will keep us close.

I thank the entire team of collaborators and colleagues at UMTRI for their support and guidance in the up and downs of carrying through with the seatbelts study, the backbone of my dissertation: David Eby, Dave Leblanc, Lisa Molnar, Mark Gilbert, Mich Rasulis, and Renée St. Louis.

I thank my colleagues in the Decision Lab. It was extremely insightful to share and discuss each others' different projects and perspectives in decision making research.

I also thank my friends in the Culture and Cognition Lab for sharing research and insights that have shaped my cultural research identity.

I extend my respect and gratitude to all faculty with whom I have taught: Carla Grayson, Stephanie Preston, Oscar Ybarra, and of course, Frank Yates. With you I taught my first sections, and later overcome the challenges in teaching, and finally learned the importance of balancing research and teaching, while also attending to the needs of students and myself. Thanks to you all, I enjoy teaching.

I extend my respect and gratitude to each faculty I have worked with at Michigan. I have gotten bits and pieces in very different research domains and methodologies. Bill Gehring, Scott Atran, Justin Barrett, Brenda Volling, and of course Dick Nisbett and Frank Yates.

And finally, I extend my warmest respect to my family and friends, and to Michigan—my school and second home.

TABLE OF CONTENTS

ACKNOWLEDGMENTS	ii
LIST OF FIGURES	vi
LIST OF TABLES	vii
LIST OF APPENDICES.....	viii
CHAPTER	
1. INTRODUCTION	1
1.1 The “Risk” Concept	1
1.2 The Challenges in Understanding How People Manage Risk	2
1.3 The Special Case of Adolescents and Young Adults.....	3
1.3.1 Adolescence and Risk	
1.3.2 Developmental Age: Cognitive and Neural Development	
1.3.3 Experiential Age: First Encounter with Risks and Risk Management	
1.4 Archetypes of Personal Risk Management	9
1.4.1 Smoking	
1.4.2 Sexual Behavior	
1.4.3 Seatbelt Use	
1.5 Aims of this Dissertation	13
2. BACKGROUND	16
2.1 Perspective 1: Risk Management.....	16
2.1.1 Risk Management in the Literature	
2.1.2 Personal Risk Management	

2.2 Perspective 2: Cardinal Issue Perspective on Decision Making	20
2.2.1 Introduction to the Cardinal Issue Perspective	
2.2.2 The Cardinal Issues and Their Appearance in an Archetype	
2.3 Policy and Spot Decisions	32
3. A TEST OF THE PERSPECTIVES: A STUDY OF SEATBELT USE	37
3.1 Introduction.....	37
3.2 Methodology	40
3.2.1 Participant Recruitment	
3.2.2 Collection of In-Vehicle Data	
3.2.3 Structured Interviews	
3.2.4 Qualitative Exploration of Video Data	
3.3 Results and Discussion	47
3.3.1 Demographics	
3.3.2 General Driving Statistics and Trip Characteristics	
3.3.3 Observed Seatbelt Use and Trip Characteristics	
3.3.4 Observed Seatbelt Use and Reported Seatbelt Use Policies	
3.3.5 Structured Interviews	
3.3.6 Qualitative Exploration of the Video Data	
4. CONCLUSIONS.....	76
4. 1 Episodic Variation in Personal Risk Management	76
4.2 The Benefits of Good Policy Decisions.....	78
4.3 Effective Personal Risk Management Policies in the Three Archetypes	82
4.4 Future Directions	87
APPENDICES	89
REFERENCES	128

LIST OF FIGURES

Figure

1. Decision Processes from the Cardinal Issue Perspective..... 21
2. The Episodic Sequence of Mode Approaches..... 35
3. The Developmental Sequence of Mode Approaches..... 36
4. Two-Screen Computer Interface Used for Viewing Driving Videos..... 43

LIST OF TABLES

Table

1. Demographics of Participants.....	48
2. Percentages of Trips with Different Trip Characteristics	49
3. Observed Seatbelt Use Rates as a Function of Trip Length, Time of Day, and the Presence of a Passenger	50
4. Frequencies of Reported Seatbelt Use Policies.....	52
5. Tradeoffs Entailed in Different Seatbelt Use Policies.....	60
6. Observed Seatbelt Use Rates by Reported Policy and Trip Distance.....	63
7. Seatbelt Use Behaviors and the Different Ways of Addressing the Need Issue...	66

LIST OF APPENDICES

Appendix

A. Interview Guide 1 – Spot Seatbelt Decisions.....	90
B. Interview Guide 2 – Policy Seatbelt Decisions.....	106

CHAPTER 1

INTRODUCTION

We live in a world of risks: Accidents; crime; diseases; natural disasters; terrorism; death. How do we address the risks we encounter on *daily* bases? And what accounts for shortcomings in how we deal with these risks? And finally, how can we make sure that we are taking the most effective approaches to *managing* these risks?

1.1 The “Risk” Concept

There are in fact many different definitions of risk, even among risk experts. In simplest form, risk is “stuff happens,” often undesired “stuff” (Martin, 2008, p. 1). This sets personal risk management as our attempt at managing that stuff so that it either does not happen, or if it happens, it does not hurt us that badly. A more formal definition of risk identifies it as the “probability and magnitude of a loss, disaster, or other undesirable event” (Hubbard, 2009, p. 8). And yet a more complete definition of the risk construct breaks it down to three critical elements: “a potential loss, the significance of that loss, and the uncertainty of that loss” (Yates & Stone, 1992a, p. 4). Thus, to assess and manage risk effectively, one must consider these three variable elements: the outcome (loss), its significance, and its likelihood. These elements are often not well distinguished by people. That is, it is common for the layperson to have difficulty conceptualizing the distinction between highly serious-outcome, low likelihood risks and less-serious-

outcome, highly likely risks. It is not uncommon for people to take into account only the most salient of those two elements, such as, say, avoiding any risk that has a chance of death, ignoring how low its likelihood may be. It is essential, however, that effective risk management considers risk in terms of all its basic elements (Carson & Bain, 2008; Yates & Stone, 1992a).

1.2 The Challenges in Understanding How People Manage Risk

The general behavior of concern in this dissertation is the management of the risks that a person encounters on a daily basis. More specifically, I focus only on the subset of personal risk management that involves personal decision making, i.e., where the person deals with the risk management himself or herself. Smoking, sexual behavior, and seatbelt use are three commonly-discussed domains that illustrate this class of personal risk management decisions and which will be addressed in this dissertation. More specifically, I consider how people address the risks entailed in those domains. Managing of those risks may include decisions to smoke or not smoke, to practice safe sex or unprotected sex, or to use or not use seatbelts while driving. That said, I will not address more global domains of risk management, such as, say, those entailing environmental hazards, because they differ in character from personal risk domains in that they are relatively involuntary. Smoking risks, for example, arise from a person's individual decision to engage in smoking behavior; nuclear risks, on the other hand, do not. For the same reason, I do not consider special cases, such as second-hand smoking, as they do not clearly fall within the domain for personal risk management of interest.

This class of personal risk management encompasses decisions that we make all the time, whether or not we acknowledge them as such. From the second we wake up in the morning until the moment we go to sleep, life presents us with various risks that we somehow deal with, sometimes well and sometimes not so well. To that extent, personal risk management is very much a *skill* that we can and ought to improve.

People's management of their daily risks presents some peculiar questions and challenges for decision researchers as well as anyone interested in understanding and improving it. One puzzling question about these common personal risk management decisions is why so many people, especially adolescents and young adults, make decisions that seem to obviously increase their risks of negative outcomes, often without a matching positive outcome. Such behavior poses major challenges to judgment-based models of decision making which limit explanations of these "risk decisions" to people's lack or incomplete understanding of the risk-benefit analysis associated with those decisions. This in turn points to the need for different and more comprehensive approaches for analyzing these risk management decisions in order to understand why people, particularly young adults, still make them.

1.3 The Special Case of Adolescents and Young Adults

1.3.1 Adolescence and Risk

This dissertation focuses on the personal risk management behavior of adolescents and young adults in particular. What is special about this class of personal risk management is that the concern is especially acute for adolescents and young people.

That is, this segment of the population is most “at risk” for engaging in behaviors of great personal risk (e.g., smoking, unsafe sex, and driving without seatbelts) and as such are least effective at managing their personal risks (Jans et al., under review). In fact, some researchers go as far as to question whether or not adolescents are developmentally competent to make risk decisions (Reyna & Farley, 2006).

In the case of seatbelt use, for example, statistics show that a disproportionately high number of adolescents and young adults actually die as a result of mismanaging the risks of seatbelt nonuse. Similarly, adolescence is a prime age for experimenting with smoking and unsafe sexual activity, at rates that are alarming especially given the great risks and potentially long term consequences associated with those behaviors.

Another reason why the management of personal risks among adolescents in particular is important goes beyond the disproportionate prevalence and immediate consequences of these risks. Of key concern here is that people’s competency, or lack thereof, in dealing with risks in adolescence can often shape their risk management in adulthood (Reyna & Farley, 2006). This influence on adult risk management may either take form by establishing life-long risk management skills, or habits, or through persistence of the risk behaviors through the lifespan (e.g., addiction).

One potential explanation for why young people are especially poor at making personal risk decisions is that they are particularly poor at perceiving risk (Galvan et al., 2007), due to incomplete development in adolescent brain structures. Another explanation points to adolescents’ inability to think of consequences that well. While

they might be correct, these explanations do not go far enough in addressing why adolescents are so ineffective in managing their personal risks. More importantly, they do not suggest ways to improve adolescent decision making.

It is convenient to think of two parallel routes that might explain how age influences the behaviors and risk management of adolescents and young adults—one developmental and one experiential. The developmental age explanation considers the incomplete development and maturation of the brain during adolescence as a major predictor of adolescents' risky behavior and personal risk management. The experiential explanation considers adolescents' relative lack of experience with life, and specifically, risks, to be the cause for their risky behavior and ineffective risk management. I discuss these two classes of explanations below.

Note that the age span of adolescence varies in the literature. The most conservative range frames adolescence to be between 12-18 years, with some researchers going as high as 25 years for the upper boundary (Spear, 2000). I sometimes refer to adolescents and *young adults* to account for this gray age span, but often refer to the period as just “adolescence,” for simplicity.

1.3.2 Developmental Age: Cognitive and Neural Development

There is strong evidence that attributes, at least partially, the risky behavior of adolescents to incomplete development of their brain, specifically, the nucleus accumbens (ACC) and prefrontal cortex (PFC) areas (Spear, 2000). Studies using functional magnetic resonance imaging (fMRI) show that neurological changes in

adolescence may make some individuals more prone to risky behavior than older people (Galvan et al., 2007). Various studies also show that adolescents are especially poor at some cognitive tasks, and that they also have underdeveloped PFC areas in the brain (Hooper et al., 2004). These findings suggest that neural alterations that occur during adolescence may predispose them to mismanage their personal risks and make them particularly likely to engage in risky behavior relative to older adults. More specific renditions of this explanation suggest that incomplete development within the ACC and related regions may alter the incentive value attributed to various types of motivationally-relevant information. This is consistent with similar explanations that attribute adolescents' disproportionately-high risky behaviors to their seeking of additional appetitive reinforcers because they seem to gain less appetitive value from given stimuli relative to older adults (Spear, 2000). While it is beyond the scope of this dissertation to propose a strict neural explanation of adolescent behavior, there is little doubt that the combination of adolescents' high sensation seeking and risk taking tendencies, their characteristic sense of being invincible, and their underdeveloped cognitive controls are related (Hayes & Plowfield, 2007). Regardless, this biologically-grounded explanation of adolescent capacity, or competence, does not necessarily challenge the prospect of decision science to explain and suggest ways of influencing adolescent decision making. Biology may indeed predispose adolescents to make less effective personal management decisions than older adults, but does not preclude the possibility of improving their decision making skills.

1.3.3 Experiential Age: First Encounter with Risks and Risk Management

There is also evidence that suggests that adolescents are no worse than adults at perceiving risk or estimating their vulnerability to it (Albert & Steinberg, 2011). Studies have shown that increasing the salience of risks associated with certain decisions has comparable effects on adults and adolescents. To the extent that adolescents and adults do not differ in their capacity to evaluate risk information, some current trends in the literature are increasingly pointing towards investigating the role of experience as a modifier of risk perception, as well as the roles of other social, emotional, and self-regulatory factors in explaining adolescent decision making. For example, recent studies show that when adolescents are asked how dangerous an activity would be *if* they were to engage in it, individuals experienced in the behavior consistently report *lower* risk perceptions than those without experience (Albert & Steinberg, 2011). The reason why experience lowers risk perception is that most high-risk behaviors do not come with immediate serious consequences. Thus, what in essence happens is that those adolescents with “successful” risk taking experiences end up lowering their initial risk perceptions, and this therefore leads to increased engagement of the risky behavior. For example, a new driver may be fully aware of the safety benefits of seatbelts, but may lower his or her risk perception of driving unbuckled, and hence the utility of seatbelt use, after trying a few unbuckled trips that do not lead to any negative outcome. Such feedback may indeed reverse the direction of personal risk management towards engaging in behaviors that would otherwise be rejected as entailing great personal risk.

Another alternative explanation for why the personal risk management of adolescents in particular allow for more risky behaviors than that of older adults is that their decision making capacity may be more vulnerable to disruption by the stresses of everyday life compared to adults. Moreover, in addition to how stressful the period of adolescence can be, it is important to note that people's *first* encounter with the need to manage such personal risks (e.g., whether or not to smoke, have (un)protected sex, or (not) use a seatbelt) occurs during adolescence. That is, it is often the first time adolescents are faced with the occasion of making these decisions. Thus, one can distinguish adolescents' risk management as decision making under even more uncertainty than in the case of older adults, with the extra uncertainty attributed to the inexperience of the adolescents and the novelty of the risk situations. Without experience in managing risks, most adolescents may have simply not had the opportunity to establish effective, long-term risk management skills (later, I will frame these as "policy decisions") and have only to rely on labile, hasty decisions that more often than not lead to ineffective risk management.

One model that illustrates the importance of experience in the management of risk decisions is a model provided for smoking decisions over the lifespan (Sloan et al., 2003). I adapt the model to the more general case of personal risk management, of which smoking, unsafe sexual behavior, and seatbelt use are illustrations. This model divides a person's life into four stages: (1) youth, when the initial risk-behavior decision is made (e.g., start smoking); (2) a discovery stage, at which the person may or may not have enough personal experience to provide "informational signals" or *feedback* about the

hazards and adverse effects of the risky behavior (e.g., hoarse throat or bad breath, in the case of smoking); (3) a day-of reckoning phase, when the person either stays in good condition or experiences a serious shock as a result of the behavior (e.g., heart attack, in the case of smoking); and (4) death, which occurs regardless of the person's personal risk management decision. This model also highlights the opportunity to establish more effective strategies for dealing with these hazards after, say, the warning signals in stage 2 or the more serious, life-threatening shocks in stage 3.

Not only does "inexperience" provide a meaningful explanation for poor risk management among adolescents, but it also highlights *why* this age group is particularly important to study. If indeed one explanation for poor personal risk management is the absence of effective risk management policies, then during adolescence would be a prime opportunity to establish such policies, and subsequently, good habits.

1.4 Archetypes of Personal Risk Management

Smoking, sexual behavior, and seatbelt use are three common illustrations of the class of personal risk management decisions addressed in this dissertation. Below I will present each of these archetypes, and discuss their prevalence and the extent to which people's management of their risks is puzzling and in need of further understanding.

1.4.1 Smoking

Smoking has long been identified as the leading preventable cause of death in the United States (Hayes & Plowfield, 2007; Mokdad et al., 2004). And in spite of the wide exposure to public campaigns and messages about the health risks of smoking, 44.5

million Americans still smoke; albeit in designated areas (Centers for Disease Control and Prevention [CDC], 2008; Hayes & Plowfield, 2007; Viscusi, 1992). It is also estimated that 24% of adolescents smoke. Moreover, more than 80% of adult smokers report beginning tobacco use before the age of 18, with estimates that *each day*, approximately 4,000 adolescents aged 12-17 try their first cigarette (CDC, 2011).

So why do these people make the peculiar, and often “disgusting,” decision to smoke (Hayes & Plowfield, 2007)? A common assumption, which is also supported by some studies, is that smokers are somehow not fully aware of the risks associated with smoking (Morrell et al., 2010). However, people’s willingness to accept restrictions on their smoking behavior (e.g., smoking bans in select areas), along with the relative decline in smoking behavior itself, suggest an increased awareness of the health hazards of smoking. Moreover, convincing findings in the literature suggest that people make the decision to smoke with full awareness of the negative health hazards associated with smoking (Viscusi, 1992). Yet, perhaps the most convincing evidence attributes adolescents’ smoking decisions to social influences, and particularly, peer influences (Baillie et al., 2005). There are also various adolescent-specific explanations that attribute smoking behavior to the developmental characteristics of adolescents, who are often characterized as sensation seekers with underdeveloped cognitive controls (Hayes & Plowfield, 2007).

There is little research in the literature that addresses the specific decision processes that lead to smoking. The closest such explanations point to people’s willingness to trade off the hazards of smoking for its enjoyment, particularly its social

benefits (Baillie et al., 2005), which, incidentally, might parallel what happens in other risky decisions, such as unprotected sex or driving unbuckled. Thus, it is conceivable that explanations of personal risk management decisions generally can account for smoking behavior in the same way that they explain risky sexual behavior and seatbelt use. Of course, there are differences among the domains, such as the particular case of addiction, which would require special consideration for understanding smoking decisions and are therefore beyond the scope of this dissertation.

1.4.2 Sexual Behavior

The second illustration of personal risk management decisions is that of risky sexual behavior among adolescents and young adults. Adolescents and young adults are known to engage in high risk sexual activities. Estimates suggest that even though adolescents represent no more than 25% of the sexually experienced population, they account for nearly half of all new cases of sexually transmitted diseases (STDs; CDC, 2010). Similarly alarming rates are estimated for unintended adolescent pregnancies. In fact, a nationwide survey of American students estimated that about 34% of adolescents engage in sexual intercourse by the time they get to ninth grade; the prevalence of sexual experience rises to 60.5% by 12th grade. As for protection during sex, condom use was estimated to be about 58% among sexually active adolescents (Grunbaum et al., 2002). Moreover, condom use by adolescents and young adults also show significant intrapersonal variation (CDC, 2010). That is, these sexually active individuals are inconsistent in their condom use decisions on episode-to-episode bases, clearly showing poor sexual behavior decisions among this segment of the population.

There are various explanations for this high rate of unprotected sexual behavior among adolescents. These explanations are not substantially different from explanations for smoking and other risk behaviors in that they also point to biological and social contributors, as well as some emphasis on risk perception; albeit most of the explanations of unsafe sexual behavior focus on women (Jans et al., under review; Patel et al., 2007). One particular direction in sexual behavior research points to promising parallels for other domains of personal risk management, namely, that of setting personal policies, or “boundaries,” to either not engage in sexual activity altogether or to prevent being put in situations of possible sexual behavior, might be the best predictors of reduced sexual behavior (Michels et al., 2005; Paradise et al., 2001). Incidentally, the literature on risk management challenges the effectiveness of such strategies. This will be discussed in more detail in Chapter 4.

1.4.3 Seatbelt Use

Seatbelt use decisions make up the third and central illustration of personal risk management decisions addressed in this dissertation. Seatbelts can reduce the severity of injury in an accident by as much as 50% (NHTSA, 1996). In spite their clear benefits, seatbelt use rates are at 84% for adults and 81% for adolescents and young adults—the lowest of any other age group (NHTSA, 2010b). Moreover, more than half of adolescents and young adults involved in fatal accidents in 2006 were unbelted (NHTSA, 2010a). Many studies also find that drivers often do not compare risks against benefits when making their seatbelt use decisions (Calisir & Lehto, 2002). In fact, some findings show no significant relationship between seatbelt use and their perceived usefulness.

The relatively high prevalence of seatbelt nonuse, especially by young adults, and in spite of awareness of the risks associated with such behavior, makes such seatbelt behavior an especially interesting phenomenon. What is more peculiar is that people make such decisions in a pattern that seems inconsistent with their own values or attitudes. A number of studies show that having positive attitudes, beliefs, and intentions of using seatbelts does not predict regular seatbelt use (Chliaoutakis et al., 2000; Knapper et al., 1976). In essence, drivers seem to agree that seatbelts are a good thing, yet some decide, for one reason or another, against using their seatbelts while driving. Some research shows seatbelt use to be most directly attributed to whether or not a driver has the *habit* of using a seatbelt (Calisir & Lehto, 2002).

1.5 Aims of this Dissertation

This dissertation sought to investigate and establish a more complete understanding of how people, especially adolescents and young adults, manage significant risks that they encounter on daily bases. Specifically, I will present and test the ability of two perspectives to guide productive efforts for understanding and improving how everyday personal risks are addressed, with focused attention on the illustrative case of seatbelt use.

The first perspective frames this problem in terms of the general concept of risk management. I will present a brief introduction to the framework of risk management in the literature, including strategies often employed by organizations to reduce or eliminate risk. I will then propose a way to adapt the general risk management model to personal

domains, as illustrated by the archetypes discussed above: smoking, sexual behavior, and seatbelt use.

The second perspective attempts to explain how people manage personal risks using the cardinal issue perspective on decision making, a framework that breaks down decision processes to their 10 cardinal elements (Yates, 2003). This conceptualization also considers risk management decisions at two levels: labile, on-the-spot decisions, or more stable, policy-type decisions (i.e., decisions about future decisions). This cardinal issue perspective, I propose, allows for more complete explanations of risk management decisions, since the framework itself is, by design, exhaustive of all issues relevant in any decision making scenario, and can address individual as well as policy decisions.

I explore the value of these two frameworks in explaining personal risk management in the case of one illustration—seatbelt use—as I discuss findings from a naturalistic seatbelt use study. My intention is to synthesize the findings from personal risk management in the case of seatbelt use, within the two frameworks introduced above, into a comprehensive understanding of the more general class of personal risk management problems.

Understanding how people, and particularly adolescents and young adults, manage their daily risk decisions is a major concern to society—parents, governments, researchers, and the adolescents themselves—all have a vast interest in improving these decisions. Thus, this dissertation is expected to contribute not only to the conceptual understanding of personal risk management, but will also highlight specific

recommendations to allow for more effective risk management decisions, and ultimately, to influence the desired behavior outcomes, whether they be reduced smoking, safer sexual behavior, consistent seatbelt use, or corresponding behaviors in other domains of personal risk management.

CHAPTER 2

BACKGROUND

2.1 Perspective 1: Risk Management

2.1.1 Risk Management in the Literature

Risk management is defined as the “identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities” (Hubbard, 2009, p. 10).

An undesirable, or “unfortunate,” event could take any form, from a simple stomach ache to a catastrophic natural disaster. Thus, any and everyone is to some extent interested in managing risks. Major organizations, in particular, take a rather formal approach to risk management, often with departments dedicated to monitoring and mitigating risks that may impact their organizations. There are four distinct strategies of managing risk: avoiding the risk, transferring the risk to another party, reducing the negative effect of the risk, and/or accepting some or all of the consequences of the risk (Hubbard, 2009). Below, I will explain these risk management categories in more detail and provide illustrations.

1. Avoidance. To avoid a risk altogether, one may choose to stay away from any action that might create any likelihood of that particular risk. For example, in order to eliminate the risk of injury or death in a car accident, one may choose to never drive or ride in a car. Likewise, to avoid the risk of financial loss, an organization may avoid a merger or new investment. While this may by far be the “safest” way to go, it is often the least practical, since risks are everywhere and going about one’s life cannot be free of risks.
2. Reduction. To reduce a risk, one may choose to take the risky action, but also take steps to reduce or “mitigate” its risks. To reduce the risk of death or injury in a car accident, for example, one may choose to drive slower, drive more carefully, and/or wear a seatbelt.
3. Transfer. In this strategy, the risk is literally shared or transferred to someone else. The best example of this is insurance. When reducing or eliminating the actual risk is not possible or practical, a person may simply buy insurance, which would in turn take over the responsibility of dealing with the consequences of the risk if it were to happen.
4. Retention. This is the default choice in any risk management domain. In this case, one simply accepts the risk as it is, in terms of both outcome as well as likelihood. This strategy is particularly effective when either or both outcome severity and likelihood are low. It is also the default way of dealing with risks when avoidance, reduction, or transfer strategies are impractical.

2.1.2 Personal Risk Management

Most literature on risk management focuses on business and operational risks, specifically organizational risk management and the insurance industry. For all practical purposes, the concept of risk management may as well be called *organizational* risk management. However, the definition itself is broad and encompassing of many domains, including the personal domains of risk management addressed in this dissertation. The risk management strategies, above, can also be adapted to either organizational or personal risk management domain.

In fact, to the extent that organizations are collections of individuals, risk management essentially begins at the personal level, and is adapted to the level of organizations (Culp, 2001). As such, the overrepresentation of organizational risk management in the literature may be only a reflection of the corporate world's higher interest in this domain, translated to more research and more publications. In fact, even risk management experts acknowledge that the term risk management is often used in a much narrower sense than it need be (Hubbard, 2009). Thus, it seems relatively straightforward to adapt the basic concept and strategies of (organizational) risk management to the personal domain.

Incidentally, the literature on risk management, given its specialization in high venture institutional settings, distinguishes risk management in extreme environments, which indeed both organizations as well as individuals ought to care about, particularly given the high magnitude of possible loss (e.g., in the case of catastrophes or natural

disasters), but neglects the management of the much more common personal risks considered in this dissertation (Martin, 2008). To that extent, not only do I adapt the principles of risk management to the *personal* domain, but also the risks that people encounter in ordinary settings, so frequently that their risks, or at least the need or ability to manage them, might even get overlooked.

That said, the development of the risk management concept in the organizational domain, in particular, is not insignificant. Organizations, particularly the large ones and which also tend to have the most advanced risk management departments, are highly established, systematic, and regulated. And to the extent that they can even afford to invest in risk management, that itself is an indication as to how they cannot afford risk. That is, they cannot allow for the same haphazard quality of how, say, you or I would manage our daily risks on individual bases. Thus, it is precisely this *investment* in risk management that people, in managing their daily risks, can most benefit from by considering the concept of risk management in organizations.

In the case of seatbelt use, for example, an individual might well benefit from understanding, from the framework of risk management strategies, that there are *only* four strategies to deal with the risks of driving, and that a decision to drive only with the seatbelt fastened is the most effective strategy (*reduction*), while driving without a seatbelt translates to an explicit use of the riskiest strategy (*retention*). Incidentally, not many individuals actually are aware of the implication of their decisions as described, but framing seatbelt use as a form of personal risk management should, in essence, help them do that.

Finally, note that even though risk management, as a concept, works in the same way for organizations as for individuals, I will consistently use the term *personal* risk management to distinguish between the domains of (organizational) risk management addressed in the literature and the class of risk management domains addressed in this dissertation, where the individual takes care of managing his or her own risks, as in the cases of smoking, sexual behavior, and seatbelt use.

2.2 Perspective 2: Cardinal Issue Perspective on Decision Making

2.2.1 Introduction to the Cardinal Issue Perspective

The second conceptual theory guiding the decision framework in this dissertation is the “cardinal issue perspective” (CIP) on decision making (Yates, 2003; Yates & Tschirhart, 2006). This perspective considers personal risk management as the management of a special class of *decision* problems: risk decisions.

Before I get into the details of this framework, it is important to establish a working definition of what a “decision” is—*a commitment to a course of action that is intended to serve the interests and values of particular people*, sometimes called the *intended beneficiaries* (cf. Yates, 2003, p. 24). For personal risk management decisions, the individual is the intended beneficiary. However, it is not out of the question for individuals to also consider others, such as family members, as intended beneficiaries.

According to the cardinal issue perspective, each decision episode consists of 10 basic issues. These issues are considered “cardinal” because they all *must* be resolved in each decision episode, even if not deliberately. Figure 1 provides a schematic illustration

of how the 10 cardinal issues appear in a decision episode, in the context of a complete decision process. (Yates, 2003)

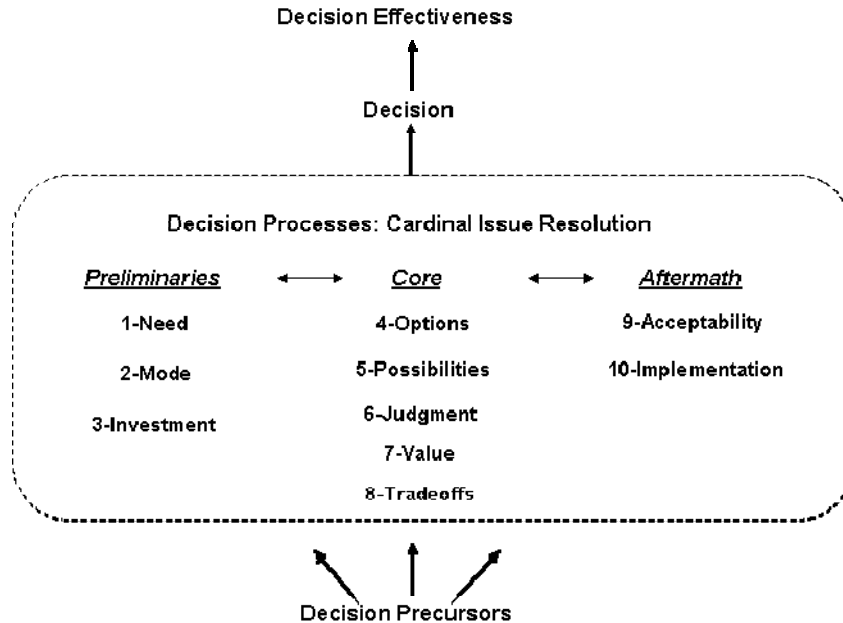


Figure 1: Decision Processes from the Cardinal Issue Perspective

As illustrated in Figure 1, the effectiveness of a decision derives from how well each cardinal decision is resolved in the decision process. Thus, one key implication from this framework is that poor handling of any of the cardinal issues can significantly compromise decision effectiveness. Conversely, to the extent that a decision maker addresses every issue well, then one can expect the resulting decision to be effective as well.

The concept of decision effectiveness entails two independent classes of occurrences: outcomes and process costs. Outcomes are, intuitively, the consequences

produced by the action taken as a result of the decision. For example, possible outcomes of any seat belt use decision are: (1) injury from a car accident (particularly if the decision was not to use a seatbelt), and (2) increased safety or even peace of mind from using a seatbelt. Process costs, on the other hand, are a measure of costs associated with making the decision. These can be material costs, such as the time spent thinking about which decision to make, or psychological, as in the anxiety a decision maker might feel while pondering the decision problem and its potential outcomes.

The 10 cardinal issues fall into three categories that correspond roughly to when they present themselves within a decision episode: *preliminaries*, *core*, and *aftermath*. (See “Decision Processes,” in Figure 1). However, and as depicted by the double-pointed arrows, the issues can also be revisited several times over the course of a decision episode. As indicated in Figure 1, the first three issues are labeled “Preliminaries,” as they set the stage for what people normally consider the *decision proper*, namely, the “Core” issues. The core issues entail all the activities that deal most directly with the deliberation of the decision and which action the decision maker eventually takes. Lastly, the issues in the “Aftermath” concern the events that usually come after making the decision, such as implementing whatever action the decision calls for.

Finally, note that the bottom of Figure 1 includes “Decision Precursors.” These precursors are basically any conditions or events that can potentially influence how the decision maker handles any of the cardinal issues. Culture is a common precursor as it can often influence how a person addresses particular issues. Age and temperament are other examples, and are key considerations for adolescents. To that extent, effective

personal risk management would benefit from awareness of these influences early on, particularly if they are negative, in order to identify and apply means to counter their influence and improve the resulting decision.

2.2.2 The Cardinal Issues and Their Appearance in an Archetype

Below I list the 10 cardinal issues, and articulate each issue in the voice of the decision maker for a generic decision problem as well as in the case seatbelt use, as a representative illustration of personal risk management decisions. In each case, I also identify and illustrate the most common ways that decision makers might fall short in addressing that issue (Yates, 2003; Yates & Angott, in press).

Preliminary Issues

I—Need: “Is there an opportunity or a threat out there that demands an effort to decide how to deal with it?”

Articulation: “Is there some threat or opportunity that requires me to make a decision about whether or not I wear my seatbelt?”

The need issue is the entry point for every decision episode, and its resolution determines whether or not it is followed by subsequent, “real” decision making tasks. Suppose the decision maker never even acknowledges the need issue, i.e., that an opportunity or threat is impending. He or she would not perceive any need to make a decision, and there will, indeed, be no decision made. Note that in this case, “no decision” is not the same as actually entering the decision episode and then “deciding to do nothing.” Perhaps the most obvious way of mishandling the need issue is when the decision maker fails to recognize the need to make a decision, and hence prematurely

aborts the decision process and ends up with poor risk management. This is illustrated in the example of a person who gets in the car, turns on the ignition, and immediately starts driving, oblivious to the fact that he or she should at least *consider* the prospect of wearing or not wearing the seatbelt.

2—Mode: “Who (or what) should be involved in making this decision, and how should they go about making the decision?”

Articulation: “Who should I get involved in making my seatbelt use decision, and what approaches should these people, including me, use in making this decision?”

Decision “modes” are the qualitatively distinct approaches for carrying out the process inherent in making a decision. The first part entails the “meta-decision” of assigning decision making tasks to person(s) (or even tools), as opposed to handling it by one’s self. That is, although individuals, by the definition of *personal* risk management, have the ability and authority to personally and solely decide whether to, say, wear their seatbelts or use adequate protection during sexual intercourse, some might, for better or worse, choose to involve other parties in their decision. If they do choose to involve others in their decision, it can happen in one of three ways: (1) decision makers may delegate that decision authority to a subordinate who serves as their “agent,” who would literally make the decision for them (this more usually relevant in medical decision making, less so in the class of personal risk management addressed here); (2) they may seek a “consultant,” who would provide advice or input, e.g., a family member in the vehicle may ask, even if indirectly, that the driver put on his or her seatbelt; or (3) use a “model,” whereby they make the decision themselves but only after observing and

mimicking how another person makes that decision, e.g., a driver may buckle up after noticing that the passenger is buckled as well.

The “approach” part of the mode issue concerns the process by which those designated to become involved in making a decision, including the individual himself or herself, actually go about making the decision. They might, for instance, reach the decision “analytically.” That is, they might think through the problem from scratch and attempt to figure out what they ought to do on their own, perhaps calling upon any of their accumulated reasoning and knowledge base. Incidentally, this is what most resembles the lay person’s understanding of the concept of decision making.

Alternatively, a decision maker might make the decision via an “experience-based” approach. This approach entails decisions that have been encountered—experienced—so many times in previous instances that the procedures for making them become automatized or habitual. Thus, whenever certain conditions come about, they automatically trigger a particular course of action: effortlessly, uncontrollably, and often beyond the decision maker’s ability to explain (and hence often called “intuitive” decision making). For example, many drivers just have the habit of using their seatbelt *every time* they drive, perhaps even putting it on before turning on the ignition. This could be so automatic that they might not even be aware of their buckling-up behavior, unless someone were to point that out to them.

The third approach is “rule-based,” and is intermediate between the analytic and experienced-based varieties. In this approach, the decision maker invokes a rule thought to be applicable and follows it. That is, given a particular set of conditions, labeled C, the

decision maker would follow a rule which specifies that, under those conditions, Decision D should be taken: $C \rightarrow D$. In the domain of personal risk management, individuals may have established rules that say something like, “Use seatbelt when driving conditions are really “bad” or “It is OK to smoke a couple of cigarettes when socializing with friends, just do not smoke regularly.” This approach is well established in medicine, law, and business, as it is efficient and effective. However, it does not seem to be as common in the personal domain, as will be discussed in Chapter 3 when reporting on young adults’ seatbelt use policies.

Finally, the mode issue is said to be mishandled when ineffective decisions can be attributed to any of the other cardinal issues that would have been more effectively addressed via an *alternate* mode. As an illustration, suppose a driver used a fellow passenger as a “model,” and ended up not wearing the seatbelt *because* following a model prevented him from addressing the subsequent issues in a way that would have actually brought about a different, *better* decision, i.e., he would have ended up using his seatbelt.

3—Investment: “In order to make this decision most effectively, what sorts and amounts of resources should be spent, or invested, in the process of making this decision?”

Articulation: “What should I spend—in time, stress, or anything for that matter—in making my seatbelt use decision?”

This issue basically entails the process costs dimension of a decision process. To the extent that decision making is never entirely “free,” the investment issue is about

making sure that the appropriate kinds and amounts of resources are made available for the decision process at hand, that the decision is reached neither too hastily, nor at greater cost than necessary. Thus, mishandling the investment issue would entail applying either the wrong resources or otherwise the wrong amount of those resources. It is not inconceivable to find some adolescents spending a lot of resources, whether time or psychological distress, trying to decide about whether to engage in a certain sexual behavior, or no resources at all. Both extremes are examples of poor handling of the investment issue, regardless of the risk management outcome. The investment issue has the potential to be very well represented in some personal risk management domains, though that is not always the case naturally with most people.

Core Issues

4—Options: “What alternatives should be considered as potential options for dealing with this decision?”

Articulation: *“What are potentially plausible alternatives for deciding about my seatbelt? What could I do to identify or come up with those options?”*

This issue is about recognizing and assembling the full set of alternatives that are *seriously* considered as viable options, *before* making the decision. It basically acts to prevent situations whereby the decision maker makes a decision only to discover that there were other, better alternative options that he or she did not even consider. But for a possible course of action to go unrecognized is not necessarily a negative thing. Suppose, for example, that a number of poor alternatives are recognized in the midst of a few good ones. Then, for a number of reasons, one of the poor options could be selected instead of

the best alternative. This is of particular concern for adolescents, who often affiliate with their peers, who are no better decision makers than they are, and for whom the most salient alternatives tend to be the ones that are most risky.

5—Possibilities: “What are all the significant consequences that could happen if I were to take this course of action?”

Articulation: *“What are the various potential consequences of my decision to either wear or not wear my seatbelt?”*

The possibilities issue concerns the recognition of all the possible significant consequences that might result from the decision made a certain way. As such, it seeks to prevent a form of blindsiding whereby the decision maker might not be satisfied with the outcome of a decision *only* because he or she never even entertained that outcome. It is common for drivers, particularly young ones, to consider (and dismiss) the possibility of themselves crashing into some other vehicle, or get stopped by police for not wearing their seatbelt, but less common to consider the possibility of some other vehicle crashing into *them* (Brake, 2011). Mishandling the possibilities issue results in what is called an “oversight.” There are two kinds of oversight: momentary and fundamental. In “momentary oversight,” the decision maker fails to acknowledge the full set of possibilities at the time of making the decision but would be likely to do so if given more time. In “fundamental oversight,” the decision maker is not likely to bring those possibilities to mind regardless of how much time is allowed. To the extent that a perfect handling of the possibilities issue can only be approached with experience, fundamental

oversights are particularly pertinent to adolescents and young adults because they often lack experience in life and in dealing with decision problems.

6—Judgment: “If this particular course of action is taken, what are the chances of its potential consequences actually happening?”

Articulation: “So I know that one possible consequence of not using my seatbelt is getting injured in an accident. But what are chances of that actually happening if I don’t use my seatbelt?”

The judgment issue speaks to the accuracy of our assessments of the likelihood of the possibilities. The more accurate the judgments are, the more likely we will be able to anticipate consequences and decide effectively. This issue is widely relevant in personal risk management, particularly in estimating the uncertainties of the risks in question, and even more pertinent to adolescents and young adults, who are shown to be least competent in judgment tasks given their incomplete cognitive development.

7—Value: “How much would the parties to this decision care—positively or negatively—if those particular consequences of this course of action actually came about?”

Articulation: “For each of the possible consequences of driving without using my seatbelt, how much would I and anyone else involved really care if they actually happened?”

The value issue can be considered as a particular case of the judgment issue, except that the judgments are anticipations of how key parties might react to particular consequences of the decision. These judgments are often less accurate than expected,

particularly for adolescents and younger people, again given their relative inexperience and opportunities for learning and growth. Moreover, to the extent that people are not always accurate about their *own* values, then it is not unreasonable to expect forecasts of others' values to be at least slightly worse. Errors in value appraisals can take two forms (Yates & Stone, 1992b). In one form, the decision maker misjudges how much he or she would like or dislike an experience because of failing to realize what that experience entails, e.g., smoking, which seems “cool,” until one tastes the bitterness of the tobacco and starts coughing. In the other error, the decision maker's misjudgment occurs when his or her actual response to an expected event is different from what was anticipated, e.g., a teenager's failure to experience the satisfying warm glow of motherhood that she had always dreamt after she learns of her unplanned pregnancy.

8—Tradeoffs: “Every potential action has both strengths and weaknesses. How should I make the tradeoffs and somehow settle on one course of action?”

Articulation: “I am faced with the decision to either use my seatbelt, or not use it. Both of these actions have strengths and weaknesses. So how should I go about making this decision?”

This issue is perhaps the most intuitive to understand. What makes this issue especially challenging are the situations which present “feature conflict,” where neither of the available alternatives “dominates” its competitor and causes a tradeoffs dilemma. In such cases, in order to decide, you would have to trade off, or exchange, a strength on one feature dimension for a strength on another (e.g., safety for comfort) because you simply cannot have both.

An improper resolution of the tradeoffs issue could entail, say, choosing comfort over safety and getting pulled over by police because of the decisions to not wear your seatbelt. Thus, handling of the tradeoffs issue in this manner would lead to a decision that leaves you worse off—less satisfied—than you could have been otherwise.

Aftermath Issues

9—Acceptability: “How can I deal with or, even better, prevent negative reactions to my decision—and *how* I made it—by the people who matter most to me?”

Articulation: “*Besides me, who would care one way or the other about my decision to wear or not wear my seatbelt (and how I reach that decision), and how will I deal with their opinions?*”

The significance of the acceptability issue is most relevant in situations where, if certain people are displeased with a decision or decision process, they can bring about serious consequences that would negatively affect the decision maker, and perhaps others as well. This issue can be quite relevant to adolescents since they are minors and are often under the guardianship of adults, and thus *must* not displease them. There are also other, sometimes less-obvious ways that decision makers can mishandle the acceptability issue, including failing to recognize differences in local norms for what is considered appropriate decisions (Yates & Alattar, 2009). The most relevant example in personal risk management is engaging in unprotected sexual behavior with a person from another culture. That person, and their family, may well have different tolerances for, say, premarital sex or, even worse, pre-marital pregnancy.

10—Implementation: "If I go through with this decision, how can I actually get that action done (or can I even get it done)?"

Articulation: "I'm considering using my seatbelt on this trip. What are any difficulties that I should anticipate in actually carrying out that action? What, if anything, could I do to deal with those difficulties?"

This issue is only relevant to select sets of decisions where making the decision and implementing it are distinct events, possibly occurring at different times and contexts. That is, it makes little sense to consider the implementation issue when you decide to accept your friend's offer to light up a cigarette for you, because saying "Yes" is often accompanied by reaching out for the cigarette. It is relevant, however, when you make the *policy* decision to never, ever, smoke. Then it would make sense to consider, how difficult it will be stick to your policy. Poor handling of the implementation issue for policy decisions, would entail, for example, setting up a particular policy but not being prepared to deal with difficulties associated with, say, resisting peer pressure.

2.3 Policy and Spot Decisions

2.3.1 The Distinction Between Policy and Spot Decisions

The cardinal issue perspective on decision making can also consider risk management decisions at two distinct levels: policy and spot decisions. Below I describe this distinction as well as its connection to the mode cardinal issue.

Policy decisions represent the class of decisions made by some people that dictate how they ought to make a particular class of decisions, often in a manner consistent with

a particular policy, or rule. Thus, policy decisions are “meta-decisions.” In the case of seatbelts, for example, an individual might decide, usually but not necessarily at an early stage in life, to establish a seatbelt use “policy” or rule that prescribes his or her seatbelt use on all (or a particular set of) trips. A more general depiction of a decision rule is as follows: *If Condition C, take Decision D*. The simplest seatbelt use rules might be something like “Never use a seatbelt” or “Always use a seatbelt.” A more complicated rule might be more like the following: “Use a seatbelt only when driving on a highway.” Thus, a “policy decision” is then defined as a decision to adopt a particular policy or decision rule.

A spot decision, on the other hand, is the actual, individual decision, often made “on the spot,” and which may or may not be consistent with one’s policy (if it exists). In the case of seatbelt use, a “spot decision” is a driver’s decision about whether to use a seatbelt on a given trip, made on the spot. This type of decision is especially important for individuals who choose not to make policy decisions and who, as a result, make all their decisions on the spot. Moreover, even people *with* established policies might occasionally rely on spot decisions, as there may be forces that override their policies and lead them to make contrary decisions at the moment.

It is important to consider *both* levels of decisions in building a more complete understanding of personal risk management. In particular, the distinction between policy and spot decisions can address plausible explanations of why people are often inconsistent in their personal risk management decisions. In the case of seatbelt use, for example, I will discuss findings from the naturalistic driving study in Chapter 3 that

attempt to explain why drivers decide to use their seatbelts on some trips but not on others. Moreover, the fact that we can conceptually distinguish between policy and spot decisions implies that, in order to approach a complete understanding of how people arrive at their observed behaviors, such as smoking, engaging in unsafe sexual behavior, or driving unbuckled, we would need to examine both decision varieties.

2.3.2 Derivation of the Distinction Between Policy and Spot Decisions from the Mode Issue

As described in section 2.2.2, there are three basic approaches to addressing the mode issue: analytic, rule-based, and experience-driven (automatic). The distinction between policy and spot decisions, discussed above, derives from the particular approach utilized in the mode issue.

Decision rules or policies implicate rule-based decision making and, in some instances, automatic decision making after a rule has been automatized, yielding what is commonly described as a “habit.” Thus, for a person who has established a particular risk management policy, in a spot decision, the mode issue is resolved in favor of the pertinent rule or habit. The policy decision making process is about deciding *which* policy to establish.

In the case of a spot decision, when a novice—which adolescents often are—deals with the mode issue, the usual approach is analytical. He or she would think about the personal risk at hand and try to figure out, from scratch, what the ideal decision ought to be. With repeated exposure to the scenario at hand, he or she—no longer a novice—

might conclude that a rule-based mode makes more sense. Then, the next task would be to settle on what that rule will be. In the case of seatbelts, for example, one way of thinking about individuals with particular policies is that those policies came as a result of how the mode issue was resolved for one or more spot decision situations confronted early on. Of interest, therefore, is how and why a person might conclude that a particular rule or policy was not the way to go.

Starting with a spot decision episode, one possible explanation is the presence or absence of “triggers.” Ideally, an experienced risk manager would recognize a certain trigger and take an automatic approach (See Figure 2).

Figure 2. The Episodic Sequence of Mode Approaches (Yates, 2005)

In a given episode:

If a triggering state is recognized, experience: Automatic

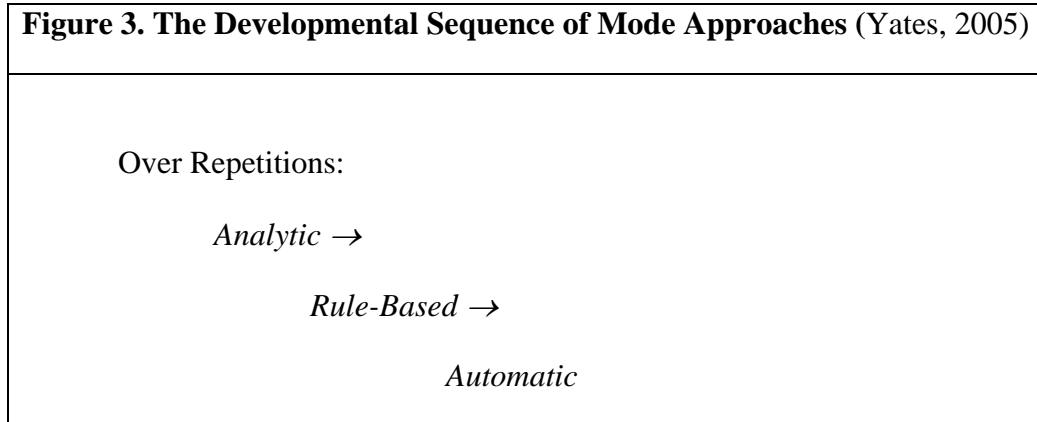
If no triggering state recognized, try: Rule-Based

If no rule applies, resort to: Analytic

In an automatic approach, recognition of this trigger should be uncontrollable, unconscious, and therefore not involve much cognitive capacity. This is ideal because it is more efficient and effortless than the other approaches. However, it is only ideal if the automatized behavior is ideal. One implication of the developmental sequence of

decision modes is that with recurrence, even poor decisions may automatize, hence “bad habits” (See Figure 3).

Figure 3. The Developmental Sequence of Mode Approaches (Yates, 2005)



If no triggering state is recognized, then the individual would try a rule-based approach. That is where it would be ideal if he or she had, in fact, established a particular policy. Given that adolescents are often novices in most risk management domains that they encounter early on, they may not have had the opportunity to establish effective risk management policies. As such, the remaining default would be to approach the decision analytically. This is where the developmental and maturity limitations of the adolescent brain and cognitive capacity might limit the effectiveness of the analytic approach to risk management.

CHAPTER 3

A TEST OF THE PERSPECTIVES: A STUDY OF SEATBELT USE

3.1 Introduction

To understand the process by which adolescents and young adults make their personal risk management decisions on a daily basis, I take an in-depth look at one particular illustration of personal risk management, namely, seatbelt use.

This study was conducted at the University of Michigan Transportation Research Institute (UMTRI), and supported through a cooperative agreement (Number DTNH22-06-H-00055) between the University of Michigan (UM) and the National Highway Traffic Safety Administration (NHTSA). Partial content of this chapter was initially written for the UMTRI Technical Report, “Analysis of Seatbelt Use Decision Making Among Part-Time Users” (Report No. UMTRI-2011-14), on which I am co-author (Yates *et al.*, under review).

3.1.1 Prevalence of Seatbelt Use

Seatbelt use is the most effective way to reduce the severity of injury resulting from a motor vehicle accident. In fact, the use of seatbelts can reduce the risk of serious injury in an accident by almost 50% (Fell et al., 2005; NHTSA, 1996). While seatbelt use among adolescents and young adults has increased from 76% in 2007 to 81% in

2009, it continues to be the lowest of any age group (NHTSA, 2010b). Moreover, adolescents and young adults are involved in three times as many fatal vehicle accidents as all other drivers (NHTSA, 2010a). In 2006, and estimated 58% of adolescents and young adults involved in fatal accidents were not using their seatbelts (NHTSA, 2010a).

The nonuse of seatbelts, especially among young adults, in spite of awareness of the risks associated with it, makes such behavior an especially interesting phenomenon. Many studies show that drivers often do not compare risks against benefits when making their seatbelt use decisions (Calisir & Lehto, 2002), and that having positive attitudes, beliefs, and intentions of using seatbelts does not predict regular seatbelt use (Chliaoutakis et al., 2000; Knapper et al., 1976). In essence, drivers seem to agree that seatbelt use is a good thing, yet some “decide,” for one reason or another, against using their seatbelts while driving.

Significant resources have been expended in the past two decades to develop effective programs and policies for increasing seatbelt use among adolescents and young adults. A recent review of more than 200 programs either targeted directly at seatbelt use or at the general risky driving behaviors of this cohort found that only a small percentage of these programs were effective (Fell et al., 2005). Most of these programs utilized increased police enforcement, incentives for using seatbelts, education, or some combination of these methods. None of the programs reviewed were empirically based on an understanding of the cognitive processes underlying the seatbelt decision of these young drivers.

3.1.2 Specific Aims and Significance to the Understanding of Personal Risk Management

This study sought to test the ability of the two perspectives presented in Chapter 2 in providing valuable, innovative insight in establishing a more complete understanding of the mechanisms underlying seatbelt use decisions among part-time seatbelt users. To the extent that nonuse of seatbelts is the result of a poor decision and that the cardinal issue perspective is comprehensive and descriptive, it would follow that such a perspective can help pinpoint precisely where, and how, the decision maker “erred” in that decision, and point toward strategies for improving it. Then, with insight from the second perspective—risk management—the specific mechanisms underlying the resolution of each cardinal issue can inform decisions pertaining to the personal risk management in other domain contexts, namely, smoking and sexual behavior.

The specific aims of this study were achieved through: (1) observing part-time seatbelt use in a naturalistic setting, within the context of broader driving behaviors, through the use of research vehicles instrumented to record seatbelt use as well as a variety of contextual factors; (2) establishing more comprehensive insight into the decision making processes underlying the use and nonuse of seatbelts, via structured interviews; and (3) qualitative exploration of the video data to identify any other contextual factors that might influence seatbelt use. In effect, the aims sought to identify plausible reasons for why this cohort of drivers “decides” to use their seatbelts on some trips but not on others, and to understand how a person’s seatbelt use policy, if present, influences his actual seatbelt use. I use insights from the findings of this study to

approach a more complete understanding of the more general personal risk management decisions described earlier.

3.2 Methodology

3.2.1 Participant Recruitment

Participants (N=24) were recruited using flyers circulated on commuter college campuses in Ann Arbor, Ypsilanti, and Livonia, Michigan. The flyers called for volunteers and promised compensation plus the complimentary use of a research vehicle for 12 days. The specifics of the compensation and the research vehicle instrumentation will be presented below. Commuter colleges—Washtenaw Community College, Eastern Michigan University, Concordia College, Cooley Law School, Schoolcraft College, and Madonna University—were chosen because they seemed more likely to have a higher proportion of young people in the desired age group who drive regularly than other non-commuter campuses, such as the University of Michigan. Due to the low proportion of respondents who met the part-time seatbelt use criteria within half the time frame allocated to the collection of driving data, recruitment sites were expanded to other public sites in Washtenaw County believed to be frequented by the target population (e.g., coffee shops, restaurants/fast food establishments, and sports venues).

Interested individuals who responded to the flyers were screened for the following eligibility criteria: being male, age 18-24, having a valid Michigan driver license, having driven for at least 2 years and currently driving at least 5 days per week, and being part-time seatbelt users. Screening for part-time seatbelt use involved two questions. First,

they were asked how often they wear their seatbelt when they drive. Responses that indicated part-time use (e.g., “most of the time or “some of the time”) were accepted as indications of part-time seatbelt use. Those who responded with “all of the time” were only included if they reported, on a following-up question, of having any occasions in the preceding 12 months in which they did not wear their seatbelts while driving. These questions were included within a list of other general driving questions so as to not highlight the seatbelt focus of the study. There was no sign that any of the participants might have suspected that they specifically participating in a “seatbelt study.” The screening also included questions intended to identify and exclude individuals who were convicted of serious driving offenses (e.g., driving while their operator’s licenses were suspended or failing to stop or identify in the scene of an accident) or who refused to grant permission for a review of their publically available driving records. No participants were excluded based on these criteria.

Eligible individuals were contacted via telephone and scheduled to come to UMTRI to pick up the research vehicle (See section 2.2.2, below, for details on the research vehicle and how it was instrumented). Participants had to show their driver’s licenses and complete comprehensive informed consent forms. They were provided with the research vehicle and given an overview of its basic driving features/operations. They were instructed to use it as their personal vehicle and to drive as they normally would for approximately 12 days. Before they left UMTRI, a return visit was scheduled for them to bring back the research vehicle. Participants were told that they would be contacted in about one week to make sure that the vehicle was functioning properly.

Participants were paid \$80 for their time; half of that amount was paid when they returned the research vehicle at the end of the 12-day period of driving and the remaining \$40 was paid after they had completed the structured interview approximately one week later. Participants were also asked to complete a short demographic questionnaire after completing the interviews. While 24 participants were recruited and drove the research vehicle for the required 12 days, only 22 of those returned to complete the interviews, despite several attempts to contact them.

3.2.2 Collection of In-Vehicle Data

The in-vehicle data were collected using six research vehicles, which were all 2006 Honda Accords, instrumented with two data acquisition systems (DAS) capable of recording a rich set of variables for the evaluation of driver behavior, vehicle motion, and the surrounding environment. These included six video feeds (two cabin views, forward scene, driver face, and both side views); GPS location data; and radar devices. These also recorded, among other things, any changes in the state of six inputs (four doors, ignition, and driver seatbelt buckle). The fastest of the two data acquisition systems was activated by opening any of the vehicle's doors and data recording was initiated within five seconds. The second DAS was activated after turning on the ignition of the vehicles. Figure 4 shows the two-screen computer interface used in the interviews and analysis. This interface displays the six video feeds, a GPS map showing the motion of the vehicle, and various trip characteristics (e.g., time of trip, distance). Participant's and passengers' faces have been blocked out for privacy reasons.



Figure 4. Two-Screen Computer Interface Used for Viewing Driving Videos

An SQL (Structured Query Language) Server database allowed events (e.g., a seatbelt being unlatched while the vehicle is traveling more than 50 MPH) to be quickly identified using queries. Video and other data around those events were then reviewed using a custom application which played back all the data sources synced in time. SQL procedures generated tables of events for each participant's data. This provided a list that could be queried to identify various points of interest during the structured interviews. When a non-driver door was opened, video was reviewed to determine if any passengers

were present. If there were, the number of passengers for that trip segment were noted and included in the data analysis.

3.2.3 Structured Interviews

Participants were contacted between 1-4 weeks after return of the research vehicle and requested to return to UMTRI for a structured interview. Each interview lasted approximately 2 hours, and was divided into two segments, corresponding to spot and policy seatbelt decisions, respectively. Each segment was in turn structured around the cardinal decision issue perspective, discussed in Chapter 2.

In preparation for the structured interviews, participants' trip data were categorized based on the driver's seatbelt use (fully belted trips, fully unbelted trips, and partially-belted trips), the presence or absence of passengers, and time of day (daytime, nighttime). A "trip" was defined as one ignition cycle with the vehicle in motion at a speed of at least 20 MPH. Trips in which the driving was done by persons other than the participant were excluded. "Partially-belted" trips were defined as trips in which the driver buckled or unbuckled at some time after the vehicle had already reached 20 MPH. Consideration of these partially-belted trips was necessary to ensure full consideration of all contextual cues (triggers) that may influence seatbelt use (particularly over the course of a given trip), but that may also explain drivers' "part-time seatbelt use" across trips. Similarly, during the structured interviews, some participants indicated that they had policies that included specific circumstances in which they did not use seatbelts. Those are referred to as "part-time seatbelt use policies."

Six trips were randomly selected from the 12 days of driving to discuss with each participant in the spot decision segment of the structured interview. For each participant, there were two trips for each of the three categories of driver belt use where possible. The presence or absence of a passenger and the time of day were balanced between the two trips to the extent possible.

The order in which trips were discussed in the structured interview was the same for each participant to the extent possible. The order of trips was: fully unbelted, fully belted, and partially belted. This order was repeated twice. Note that one participant had no fully unbelted trips, some participants never had passengers, and some did not drive at night. Because of this, some participants discussed as few as four trips while others discussed six trips.

Video clips of the selected trips and other trip-specific data were reviewed prior to the interviews to familiarize the interviewer with the participants' seatbelt use behavior and to infer how participants might address each decision cardinal issue. The review also helped identify any contextual cues that might be relevant to participants' belt behavior, e.g., passenger type, participant state, seatbelt behavior.

Each structured interview began with a discussion of spot decisions. Questioning of participants' spot decisions was always done first to reduce the influences of the policy decision discussion on spot decision responses. Recall that spot decisions in this context are related to the actual decision made to use or not use a belt on a specific trip. The participant was presented with trip video of him (in the driver's seat) and the vehicle interior and given detailed trip information including the date, time, and location on a

map to help the participant recall the trip from memory. Figure 4 shows the computer monitor display used during the interviews and analysis. The interviewer made sure that the participant could correctly recall the specific trip and asked him to respond to subsequent questions from the perspective of that trip. The participant was then asked to describe his thinking and to respond to specific questions concerning his use or non-use of the seatbelt. It was sometimes necessary for the interviewer to forward and stop videos at various points of interest (e.g., to locate when participants put on their seatbelts during partially-belted trips). A complete interview guide for the spot decisions part of the interviews, prepared by my advisor and collaborator Frank Yates, can be found in Appendix A. Once the discussion was completed for the first trip, the interviewer repeated the process for the remaining trips. Participants' responses were noted by the interviewer directly on the interview guide, along with the several direct quotes made by participants.

The second half of the interview was devoted to discussion of belt use policy decisions. During this part, participants were asked to think about their seatbelt use decisions in general terms and not in reference to any of the particular trips that were reviewed earlier. A detailed interview guide for policy decisions, also prepared by Frank Yates, can be found in Appendix B. Participants' responses were again noted on the interview guides.

Immediately after each interview, participant responses were reviewed and initial conclusions were made about how each decision cardinal issue was addressed for both spot and policy decisions. At the completion of all interviews, data from all participants

were again reviewed and conclusions were made, including comparisons with in-vehicle instrumentation data.

3.2.4 Qualitative Exploration of the Video Data

This last part of the analysis entailed an extensive qualitative examination of the remaining video data that were not used in the interviews. This examination was unstructured exploration of the ethnographic type, with the aim of picking up any cues that may add to the understanding of how these young adult participants made their seatbelt use decisions. The interviewer took notes of *any* cue or behavior that stood out as a potential trigger for participants' seatbelt use. Since it was impossible to examine the entire set of video footage collected for each participant, only the driving trips in which there were passengers were reviewed, as those tend to be the most complex in terms of what occurs in the cabin and could thus highlight various triggers that could influence seatbelt use behavior (e.g., driver-passenger interactions, multi-tasking, conversations). Also, these videos were the most readily understandable without having the participants available to comment on their seatbelt behavior, relative to the non-passenger trips which would require much greater interpretation as to what was happening in the cabin. At the completion of this exploration, all data were again reviewed and final conclusions were made, including comparisons with in-vehicle instrumentation data.

3.3 Results and Discussion

3.3.1 Demographics

The average age of the 22 participants was 21 years, ranging from 18-24 years. All participants were single and had never been married. The highest level of education,

race, and annual income of participants are shown in Table 1. As can be seen, most of the participants were college students, with a low annual income. All but two participants were either White or Black.

Table 1. Demographics of Participants	
Demographic Category	Percentage
Education	
High School	0.0
Some College	95.5
Bachelor's Degree	4.5
Master's Degree or higher	0.0
Race	
White	50.0
Black	36.4
Native American	0.0
Asian	4.5
Hispanic/Latino	4.5
Hawaiian/Pacific Islander	0.0
Annual Income	
\$0-\$15,000	68.2
\$15,001-\$25,000	22.3
\$25,001-\$35,000	4.5
\$35,001-\$50,000	0.0
> \$50,000	4.5

3.3.2 General Driving Statistics and Trip Characteristics

Participants varied greatly in terms of the distances driven during their 12 days of driving; $M = 993$ miles, $SD = 766$ miles, Range = 305 to 3,479 miles. On average, participants took 95 trips ($SD = 35$ trips, Range = 22 to 157 trips). Table 2 breaks down those trip averages according to trip length (short trips; defined as those trips with distances shorter than 2.5 miles), time of day (nighttime), and the presence of at least one passenger. These are the trip characteristics among which seatbelt use will be compared in the analysis. Recall that a trip was defined as the vehicle ignition being turned on to the ignition being turned off, with the vehicle speed reaching at least 20 MPH at some point during the trip.

Trip Characteristic	Average, %	Standard Deviation, %	Range, %
Short	38	14	12-71
Nighttime	44	13	26-81
Passenger	35	21	2-74

3.3.3 Observed Seatbelt Use and Trip Characteristics

Observed seatbelt use rates were calculated as the proportion of trips in which a participant used his seatbelt out of the total number of trips he made. On any given trip, participants either used their seatbelt the entire trip (fully-belted), not at all (not belted), or for a portion of the trip (partially-belted). Partially-belted trips were defined as those

trips in which participants put on the seatbelt after having reached a cruising speed 20 MPH. For the purposes of calculating seatbelt use rates, partially-belted trips were considered “belted.” Overall, the seatbelt use rate was 88% (SD = 21%; Range = 3% to 100%). I also calculated seatbelt use rates as a function of trip length, time of day, and the presence of at least one passenger. In order to normalize the positively skewed distribution of the seatbelt use rates, I applied an arcsin non-linear transformation to the rates. Paired sample t-tests were conducted on the transformed seatbelt use rates to determine if the rates differed significantly within the two levels of each trip characteristic variable. The seatbelt use rates and the results of these analyses are shown in Table 3.

Trip Characteristic	Seatbelt Use Rate, %	Standard Deviation, %	t-test	Significance
Short Trip (< 2.5 miles)	77	25	t(21) = 6.12	<i>p</i> < .001
Long Trip	93	21		
Nighttime	85	23	t(21) = 3.29	<i>p</i> = .003
Daytime	89	20		
Passenger	90	18	t(21) = 3.33	<i>p</i> = .003
No Passenger	84	22		

As can be seen in Table 3, seatbelt use was higher on trips that were longer than 2.5 miles, made during the day, and had at least one passenger present. Each of these differences was statistically significant.

3.3.5 Structured Interviews

3.3.5.1 Policy Seatbelt Decisions

3.3.5.1.1 Reported Seatbelt Use Policies

Of the 22 participants interviewed, 12 reported following some sort of policy about whether to use a seatbelt while driving. The other 10 participants said that they did not follow a policy and that they made the decision to use or not use a seatbelt on every trip. Of those who reported following a policy, five distinct policies were reported. Table 4 shows participants' reported seatbelt use policies, along with any exceptions that the participants said sometimes would cause them to diverge from their policies. Seven of the participants who reported following some kind of policy regarding seatbelt use said their policy was to *always* use their seatbelt (Policy 1). These participants said that they followed their policies almost always without fail, and attributed any departure from the policy to "spot" decisions that had to do with either a short trip distance, distraction, or simply forgetting. Five participants reported deviating from full seatbelt use as a consequence of following a particular policy (Policies 2-5). Those part-time use policies ranged from using seatbelts on all but short-distance trips, to some combination of conditions comprising using seatbelts when family members are riding along as passengers, or when driving at high speeds, at night, in severe weather conditions, or in areas known to have frequent police patrols. Further probing of the short-trip part-time policies revealed that participants regarded short-distance trips as being less than 2 miles or shorter than 5 to 10 minutes. Participants rationalized these policies on the grounds

that seatbelt use was unnecessary given the low perceived likelihood of getting a police ticket or getting into an accident. They attributed this lower likelihood to both the shorter trip time and the usually slower driving speeds that characterized short trips. The short-trips part-time seatbelt policy appears most consistent with the deviations cited for Policy 1, suggesting that the majority of young male drivers who have some policy of using their seatbelts tend to relax that policy, or even dismiss it, for short trips.

Table 4. Frequencies of Reported Seatbelt Use Policies		
Seatbelt Use Policy	Frequency	Spot Exceptions
Policy 1: Always use seatbelt	7	Short trips, forgetting, distractions
Policy 2: Use seatbelt except for short trips	2	Forgetting, distraction caused by presence of other passengers
Policy 3: Use seatbelt except for short trips, but always use seatbelt if family members are passengers or when it is late at night	1	Familiarity with road and surroundings (only for night time rule)
Policy 4: Use seatbelt except for short trips, in areas known to have lots of cops, or when family members are passengers	1	None
Policy 5: Use seatbelt if mother or father are passengers, if driving at high speeds or in severe weather conditions	1	Comfort, forgetting
No seatbelt use policy	10	
Total	22	

Another policy attribute reported by participants was to always use their seatbelts when driving with other family members in the car, specifically parents and younger siblings (Policies 3-5). This stood out from other policies in that most participants who reported it also reported stricter adherence to it, than say, the short-trip policy. Note that for all the part-time seatbelt use policies, the absence of the conditions for belt use does not necessarily mean nonuse. For example, a participant with a policy prescribing that he uses a seatbelt when family members are passengers may also decide, on the spot, to use his seatbelt when driving alone as well. He just does not have a particular policy to follow when, say, driving alone. Thus, one can speculate that the 10 participants who said that they did not follow any policy about when to use their seatbelts were, in effect, deferring their decisions on seatbelt use to be made on the spot.

In the subsequent sections I present a synthesis of the interview results for the 22 participants who came for the interviews, guided by the cardinal issue perspective. I start with policy seatbelt use decisions, followed by the spot decisions, in reverse order from how they were presented in the interviews.

Preliminary Issues

Policy Decision Issue 1—Need. Discussions of how participants came to adopt their particular seatbelt use policies revealed the influence of circumstances surrounding their early years of driving. Often, either the participants, or people they knew very well, were involved in a vehicle accident which made them appreciate the value of seatbelt use. For these participants, the accidents they or their friends had experienced were vivid in memory, and they recounted the incidents with passion as justifications and explanations

for their decisions to adopt seatbelt use policies. One participant said the following: “My friend had an accident in 2003, I was in the car with him. We were OK, but he was more hurt than me because he didn’t have his seatbelt on. At that time I didn’t have that rule, I just happened to put on my seatbelt. But after that incident it became a regular habit to always wear my seatbelt.” Participants also reported being brought up to believe in the importance of seatbelt use, sparked by whatever their parents and driver’s education instructors told them in their early driving years as well as accumulated exposure to seatbelt related statistics.

For participants who reported not following any seatbelt use policy while driving, further questioning revealed that they were not necessarily against having seatbelt use policies, but rather the idea of setting up a policy never crossed their minds. This suggests that the main driver of the “decisions” to not have seatbelt policies was their handling of the need issue, with the default decision being to not have a seatbelt use policy, and go about making seatbelt use decisions on the spot. Incidentally, this also suggests a potential intervention which will be discussed later. It can be presumed that these participants either were never exposed to circumstances that would have triggered the need for some seatbelt use policy (e.g., neither life-changing accidents nor upbringing in pro-seatbelt use family cultures), or they were never affected by such circumstances as were those who ended up making seatbelt use policies for themselves.

As a practical implication, it would seem that simply getting the policy issue under consideration would be enough to trigger acknowledgment of the need issue, which would in turn lead to more frequent adoption of seatbelt use policies, and subsequently

higher rates of seatbelt use. It would seem imperative, and not surprisingly so, that parents and driver's education instructors should attempt to instill in young drivers the habit of seatbelt use early on, to avoid the necessity of having to make the seatbelt use decision on individual driving occasions and risking making an instantaneous decision to drive unbuckled.

Policy Decision Issue 2—Mode. Participants consistently said that they devised and adopted their respective decision policies themselves. Information and advice provided by parents and instructors, often regarded as role models, served only to reinforce the importance of seatbelt use and make it more natural for them to adopt such policies; that is, that making their seatbelt use policies “just felt right.” When asked to explain his approach to coming up with his seatbelt use policy, this participant's statement represents most others: “I went with what felt right based on my past experiences. I never really analyzed why it's important to make a policy for myself.” Only one participant said that he approached the decision to come up with a seatbelt use policy somewhat analytically, while also suggesting an experiential approach at the same time. He said: “I wasn't deep thinking. It's somewhere between figuring it out from scratch, and also going along with what felt right. I did it because it's what I should do.” Incidentally, this was a participant who had gotten into first accident when he was 16, and also received at least one police ticket for not using his seatbelt shortly after that. Thus, it makes sense that this sort of experience gets one to think a little more critically about seatbelts and at the same time make the need for setting up a policy more salient.

Policy Decision Issue 3—Investment. Every participant said that he spent little or no time in coming up with his seatbelt use policy. A common sentiment was illustrated by a comment made by one participant: “I didn’t spend nothing (sic), I just naturally knew what to do.” Another said, “It just felt like the right thing to do given my experiences and my accumulated exposure to pertinent information, including seatbelt safety statistics.”

Core Issues

Overall, participants had little to say about the core decision issues. Presumably, this was because the participants who had decided to make seatbelt use policies for themselves did so as a result of circumstances that consistently pushed for as close to full seatbelt use as possible, with some slightly more lax seatbelt use policies (e.g., making exemptions for short trips). In other words, they were participants who were “pro-seatbelt use,” as a general principle, and made their policies according to their judgment and lifestyles and what they figured to be a more reasonable policy to follow. There were no participants in this analysis who contemplated holding a seatbelt use policy (and hence actually addressed these core cardinal issues) and then decided to *not* have a seatbelt use policy or to have one that prescribed nonuse.

Policy Decision Issue 4—Options. All but one participant with a full-time seatbelt use policy said that they saw no other alternatives to their policy. Most said something similar to what one full-time policy participant said: “I saw no other alternatives, not even the option to not wear my seatbelt.” The participant who was an exception reported having pondered a partial seatbelt use policy, in which he would “only

wear a seatbelt when there is a high chance of being stopped by police.” Again, this bias might be explained by the selection of these participants. These were participants who had circumstances that triggered the need for a seatbelt use policy, and not the full range of drivers at large. For most of these participants, whatever their seatbelt use policy, it somehow surfaced as the natural thing to do given their experience and upbringing, and they made no effort to try to generate alternative options.

A few of those with part-time seatbelt use policies reported considering a full-time belt use policy, but none adopted this rule. No participants mentioned full-time nonuse of seatbelts as an option. For example, one participant characterized the consideration as, “...I guess I could *not* use my seatbelt, but that’s not really an option.” It is, however, assumed that this alternative is always present if not acknowledged by participants. To that extent, our participants may have dismissed the full seatbelt nonuse alternative from their viable option set very early on and surely before considering the possibilities, judgment, and values issues.

Policy Decision Issue 5—Possibilities. Participants mostly agreed on the different possibilities that could happen as a result of varying degrees of seatbelt use, namely, getting injured in an accident and getting a police ticket for not wearing a seatbelt, also noting their ability to avoid the unpleasant outcome. What seemed most prominent were arguments raised by some part-time policy participants. One participant explained his take on the utility of having a seatbelt policy with respect to these two possibilities, explaining that “having a rule is good because sometimes you could forget to follow it but most times you do follow it, and when you don’t follow it then you are

reminded that you are not doing the right thing. Besides, if I don't wear my belt, then my brothers would probably not be wearing their belts either, and they could all be injured in an accident, which would be avoided if I had my belt on."

Policy Decision Issue 6—Judgment. When asked to report what they believed to be the probabilities of their stated consequences happening as a result of having their respective seatbelt use policies, all but one participant said with confidence that always having the seatbelt on would always reduce injury in an accident and always prevent getting a police ticket. The "outlier" participant said that the chance of being hurt in an accident was 50-50, presumably based on his general beliefs about the uncertainty of things in life. One participant with a policy of not using his seatbelt on short trips argued that his policy does not make these possibilities any more likely to happen. He explained that from experience, he "never got pulled over for not wearing his seatbelt on a short trip." Another one admitted that his distance-related part-time seatbelt use policy would allow for slightly increased risk of getting a police ticket. He said, "My luck could be that police are behind me and give me a ticket even though I'm only going a short distance." Interestingly, neither driver brought up the risk of injury in an accident when discussing the judgment issue.

Policy Decision Issue 7—Value. Most participants said that besides themselves, they thought that family and friends would also care whether or not the possibilities—getting injured in an accident or a getting police ticket—were to actually happen. One participant's comment was particularly illuminating. "Let me clarify," he said, "I'd not be happy if an accident was to happen, but I'd be happy that I had my seatbelt on if it were

to happen.” Another participant explained that he would be extremely unhappy if he got a seatbelt ticket because his “record is clean and getting a ticket would mess it up.” Surprisingly, he had a part-time seatbelt policy, which is at best explained by part-time seatbelt policy holders’ belief that their policies are nearly as good as full-time seatbelt use policies in preventing, say, police tickets.

Policy Decision Issue 8—Tradeoffs. In discussing the strengths and weaknesses of the different seatbelt use policies, participants restated their belief that having a full-time seatbelt use policy was the only way to ensure the greatest reduction of injury in an accident, as well as to completely avoid seatbelt-related tickets (see Table 5). Some participants also reported potential discomfort of using seatbelts, making it the only possible weakness of seatbelt use, but also saw it as an insignificant tradeoff to the benefits of seatbelt use. Still, they explained that they had no difficulty choosing their policy. One participant said, “I came to a point when I could say that safety, and having a long life, are far more important than regretting any unsafe behavior; comfort wasn’t an issue at all.” This is consistent with the non-compensatory strategies of decision making, whereby the decider concludes that one set of advantages (disadvantages) are so critical that they cannot be offset by opposing disadvantages (advantages; Yates, 1990).

The most seriously considered tradeoff was for those with part-time seatbelt use policies who recognized that their policy left room for *some* chance of suboptimal injury reduction in an accident and of being ticketed during those selected trips in which they did not use their seatbelts. These participants reported resolving this dilemma by reasoning that the chance of getting in an accident or being cited for nonuse of a seatbelt

was very small. They argued that their policy gets them almost the same benefits of full-time seatbelt use, with the added luxury of getting away with a few unbuckled trips. To the extent that these participants may have underestimated the likelihood of accidents and police tickets on the particular trips on which their respective policies permits seatbelt nonuse, e.g. short-distance trips, this may explain why they too reported no dilemma in making their seatbelt use policy decision.

Table 5. Tradeoffs Entailed in Different Seatbelt Use Policies		
Alternative	(Relative) Strengths	(Relative) Weaknesses
No seatbelt use policy	May be more comfortable	Safety, ticket
Policy 1: Always belt	Safety, no tickets	Maybe a little less comfortable
Policies 2-5: Part-time belt use (long trips, family passengers, and higher risk driving conditions)	Relative safety, almost no chance of ticket	Possible chance of getting a pulled over Higher chance of injury in an accident

Aftermath Issues

Policy Decision Issue 9—Acceptability. Discussion of the final two cardinal issues showed consistent agreement among participants that they made their seatbelt use policy decisions themselves, and *for* themselves. To the extent that their families and friends would care that they used seatbelts while driving, participants were insistent that they, themselves, were the sole benefactors of their seatbelt use policies. There was no mention of the law or police enforcement as potential stakeholders of seatbelt use

policies. One participant's response to the question of who he thought would care about what and how he arrived at his seatbelt use policy was typical: "No one really that I thought of. Though initially my early training and habits started with my mom and driver's education instructor, I don't think anyone cares at this point about me having a seatbelt use policy."

Policy Decision Issue 10—Implementation. There was also no mention of any difficulties in implementing participants' seatbelt use rules, aside from occasional forgetting. Participants repeatedly said, sometimes jokingly, that "It's not hard to put on a seat belt." One participant with a part-time seatbelt policy explained that because his vehicle is old and has both a seat and broken shoulder belt system, his policy makes things much easier for him since he would not have to go through the hassle of buckling on short trips. Note that this participant was an exception. On the issue of forgetting, one participant said that his vehicle did not have a seatbelt reminder system and wished that it did so he would never forget to follow his full-time seatbelt use policy. Two participants with full-time seatbelt use policies also argued, correctly, that it is in fact more difficult to not have a policy, because then they would have to make a seatbelt decision *every time* they got in their cars, as opposed to having the decision made in advance and just implementing it regularly.

This speaks to a very important point, which, if recognized, would explain the key benefit of setting up and following seatbelt use policies. In essence, establishing policies can improve the effectiveness of spot decisions in multiple ways. First and foremost, full seatbelt use policies correlate with higher seatbelt use (see Table 6), thus they improve

the outcome aspect of decision effectiveness. Moreover, they also facilitate the task of seatbelt use itself. That is, one would not have to go through the entire process of a seatbelt use decision in every episode. More specifically, having a policy can implicate the spot decision in multiple ways: Policies can serve as triggers for the need issue. They also, by definition of policy, implicate the mode issue, pushing for rule-based approaches, which can in turn evolve to automatic approaches (habits). And they also entail the investment issue in that they minimize the costs of spot decisions. Finally, all this virtually assures that the implementation issue is resolved quite positively

That said, it actually appears from the data that only a certain segment of drivers actually employ seatbelt use policies, with the others having not even entertained that option, and simply make their seatbelt decisions on the go. In addition, the investment costs that are referred to here were never mentioned in the spot decisions part of the interviews, suggesting, again, that participants are often not aware of the costs of deciding whether or not to put on their seatbelts on a case-by-case basis. As a recommendation for increasing seatbelt use among this segment of the population, it would seem to make sense to encourage drivers to set up seatbelt use rules early on to avoid the necessity of making the seatbelt use decisions on individual driving occasions, which are costly in terms of both process costs as well as outcome (i.e., they may lead to decisions of not using seatbelts).

3.3.5.1.2 Reported Seatbelt Use Policies and Observed Seatbelt Use Rates

Given that participants expressed a number of different policies regarding use of seatbelts, it makes sense to ask how these policies related to their actual seatbelt use.

Thus, I analyzed trip seatbelt use as a function of reported policy. The results are shown in Table 6. As shown in this table, participants with a full-time seatbelt use policy used their seatbelts on 97% of trips, those with no policy used belts on 93% of trips, and those with a part-time policy had the lowest use at only 67%. A one-way ANOVA of the transformed rates showed that there was a significant difference among seatbelt use rates: $F(2,19) = 5.41, p = .014$. Tukey post hoc tests (also on the transformed rates) showed that the seatbelt use rate for participants with part-time seatbelt use policies (67%) was significantly lower than the rates of those with full (97%, $p = .014$) or no seatbelt use policies (and 93%, $p = .037$). There was no statistical difference between the seatbelt use rates of participants with part-time seatbelt use policies and those with no seatbelt use policies.

Seatbelt Use Policy	N	Seatbelt Use Rate, % (SD)	Average Trip Distance, Miles (SD)	Seatbelt Use Rates for Short Trips, % (SD)	Seatbelt Use Rates for Long Trips, % (SD)
No Seatbelt Use Policy	10	93 (8)	9.9 (5.2)	78 (21)	96 (4)
Policy 1: Full Time Belt Use	7	97 (3)	14.7 (6.6)	92 (6)	100 (1)
Policies 2-5: Part-time Seatbelt Use	5	67 (38)	6.0 (2.3)	52 (31)	76 (43)
Total	22	88 (21)	10.5 (6.0)	77 (25)	93 (12)

To further investigate why those with a part-time belt use policy had such low rates of using seatbelts, I calculated the average trip length among each of the three groups. I found that those who reported part-time seatbelt use policies tended to take shorter distance trips (trip distance mean = 6 miles; SD = 2.3 miles) than those with no policy (trip distance mean = 9.9 miles; SD = 5.2 miles) or a full seatbelt use policies (trip distance mean = 14.7 miles; SD = 6.6 miles). An ANOVA calculated for participants' reported seatbelt use policies and the average distance of trips they drove during the 12 days of data collection showed that the average trip distance varied significantly as a function of the reported policy [$F(2,19) = 7.79, p = .004$]. Tukey post hoc tests showed that this main effect resulted from a significant difference in average trip distance between participants with a part-time seatbelt use policy and those with either no policy or a full-time seatbelt use policy. Interestingly, participants with part-time seatbelt use policies did not mention that they drove many short distance trips or that when compared to others they drove shorter trips.

One possible explanation for this is that those participants with part-time seatbelt use policies made such policies because they tended to also make more frequent short trips. That is, their (short-distance) trip characteristics called for policies that permitted seatbelt nonuse on those selected trips, and required its use on longer trips. Surprisingly, as shown in Table 6, all participants, regardless of policy, had lower seatbelt use on short trips, with the seatbelt use percentage point difference between the two trips lengths being about the same for participants with no policy and those with a part-time policy (18

and 24 percentage points, respectively). Thus, further investigation would be needed to explain the interaction between trip distance and seatbelt use policy decisions.

3.3.5.2 Spot Seatbelt Decisions – Cardinal Issue Perspective

This section presents our analyses of participants' discussions about the set of trips we selected from each participant's 12 days of driving. Again, the interview data were analyzed and are presented according to the cardinal decision issue perspective, combined across different seatbelt states (belted, not belted, partially belted) and trip characteristics.

Preliminary Issues

Spot Decision Issue 1—Need. Before a driver can make a decision about whether to use a seatbelt on a particular trip, he first needs to acknowledge the *need* to make such a decision--that there is a real “need” to make a decision to deal with an impending (if not already existing) significant calamity or opportunity. Participants' comments on their seatbelt-related thoughts and behaviors revealed five distinct patterns of behaviors and two distinct approaches for addressing the need cardinal issue for seatbelt decisions. These behaviors and approaches are shown in Table 7. In “obliviousness,” the driver makes no attempt to detect possible impending opportunities or threats that would warrant an effort to decide how to address opportunities or threats via making a decision to use a seatbelt. He either used or did not use his seatbelt, per his usual habit. On the other hand, other participants followed the “demand/response” approach. In these cases, participants are subjected to a request or demand to make a

decision to either use or not use a seatbelt. This demand may be explicit, such as the case with seatbelt reminder systems, or it may be implicit, such as the case where the mere presence of a passenger or severe weather conditions dictated to the driver the need to use a seatbelt.

Seatbelt Use Behavior	Approach
Participant puts on seatbelt upon entering vehicle, automatically, without thinking about it	Obliviousness
Participant does not use seatbelt in entire trip; possibility of using seatbelt never crosses his mind	
Participant puts on seatbelt upon entering vehicle, reminded by some trigger	Demand/Response
Participant puts on seatbelt late into the trip; possibility of using seatbelt does not cross his mind at first but some reminder later on triggers the need for a seatbelt decision	
Participant does not use seatbelt in entire trip; possibility of using seatbelt comes to mind but participant decides to not put on seatbelt (Decision may be made upon entering the vehicle or later)	

On belted trips, participants consistently explained that they put on their seatbelts automatically and without thinking. One participant’s response was typical of others in that category: “I just put on my seatbelt out of habit, it’s like what I always do and I don’t even think about it.” A similar approach to the need issue was apparent for most non-belted trips. When asked about their seatbelt-related thoughts for non-belted trips,

participants most commonly said something like: "...I wasn't thinking anything; the idea of using my seatbelt never even crossed my mind."

It also appeared that trip length was an important factor influencing how participants addressed the preliminary cardinal issues, and their subsequent seatbelt use spot decisions. Specifically, some participants who said that they did not even *consider* using their seatbelt on a given trip also alluded to the shortness of the trip length. To the extent that they addressed the need issue through "obliviousness" it would seem impossible for distance considerations to enter into the decision process. Thus, it seems that two competing models can represent the role of habit in seatbelt use. That is, there appears to be one main habit for the average trip, which could dictate, for example, full seatbelt use, and then another habit specific for short trips, which dictates no seatbelt use. Thus, the participant would engage the appropriate habit given the anticipated length of the particular trip. There would also have to be some trigger that would shift a person's attention from one habit to the other (e.g., knowing the destination of the trip prior to entering vehicle) without having to actively consider the use or nonuse of the seatbelt.

Thus, it seems that habit plays an important role in making (or not making) spot seatbelt use decisions. In either case, when a person's habit accounts for his or her seatbelt use behavior, that seatbelt spot decision is the simplest and the least cognitively demanding, since the seatbelt behavior occurs automatically (via the mode cardinal decision issue) without further engagement of the subsequent decision issues. Note also that the relationship in mechanisms between these habits and the seatbelt decision rules discussed in the policy decisions section. Regular implementation of seatbelt use

decision rules can automatize seatbelt behavior into habits. Note also the important role of trip length for both spot and policy seatbelt use decisions.

There also appeared to be two factors that disrupted regular habits. First, there were “distracters” (e.g., passengers, phone) that participants sometimes said disrupted their habit of regular seatbelt use. There were also “reminders” (e.g., passengers, the seatbelt reminder system, or weather/road conditions) that sometimes reminded participants who were otherwise oblivious to the need to make a seatbelt decision that they do, in fact, need to make such a decision (see “demand/response” section of Table 7). This may help to explain the delayed seatbelt behavior of some participants in partial seatbelt use trips.

Spot Decision Issue 2—Mode. In most cases, participants said that no one besides themselves had a role in their decision to put on their seatbelt. But in cases when a passenger was present, participants usually gave a partial role to the passenger, acknowledging his or her influence while adding that they would probably have used the seatbelt even if driving alone. One participant gave a larger role to passengers and explained for a case in which he was driving unbuckled along with an unbuckled passenger: “Usually when I’m with a passenger who doesn’t have his seatbelt on I usually mimic. So it may be that if he had his seatbelt on or said something then I would have put it on.” There were also some mentions of the vehicle’s seatbelt reminder system.

Spot Decision Issue 3—Investment. As spot decisions are split-second decisions, the investment issue seemed irrelevant. Participants did not spend any time or effort thinking about the seatbelt use decisions for the cases presented in the interviews.

Core Issues

These core cardinal issues were only addressed for cases in which the participants recognized the need to make a seatbelt use decision, which excluded all “habit” cases. Moreover, many of those cases were in turn not discussed because participants said they made their decisions to put on their seatbelts immediately following their acknowledgement of the need to make the decision but did not really address any of the core issues for those particular cases. For the remaining eligible cases, participants had little to say, and with little variation, regarding the core cardinal decision issues.

Spot Decision Issue 4—Options. Participants did not acknowledge options other than using or not using their seatbelts. Of all the driving cases presented in the interviews, there was just one case in which a participant “faked” seatbelt use by only putting the seatbelt over his shoulder. He explained that he was just being “lazy” by not buckling for the entire trip, and did the minimum required to avoid a police ticket.

Spot Decision Issue 5—Possibilities. Participants cited injury in an accident and getting a seatbelt ticket as the two main potential consequences of the seatbelt use decision. Some participants mentioned comfort as a “somewhat” legitimate consequence. For some trips, participants only mentioned accidents while in others they only mentioned tickets.

Spot Decision Issue 6—Judgment. While participants were not confident about their estimated probabilities of an accident or ticket outcome actually happening, they all agreed that using the seatbelt would reduce injury in an accident and eliminate the possibility of getting a seatbelt-related ticket.

Spot Decision Issue 7—Value. Participants cited family members, and sometimes friends, as people who would care about those consequences if they were to happen. Not surprisingly, injury in an accident was of highest value, followed by the seatbelt-related ticket. Indications of why family members would care if participants were injured ranged from merely caring about their wellbeing to caring that participants remained alive and in good health to take care of them later in life. Indications for why family members would care about police tickets ranged from making sure that the participant would maintain a good driving record (and remain eligible to drive) to caring because they (the families) would in fact have to pay for those tickets. Comfort was often dismissed at that point.

Spot Decision Issue 8—Tradeoffs. For participants who addressed the tradeoffs issue in spot decisions, they resolved it as easily as they did when considering policy decisions. Participants cited two advantages of using a seatbelt—reduced injury in an accident and avoiding tickets—and made no serious consideration of other factors, such as discomfort, as a tradeoff. Often participants put safety first, although some participants reported putting on their seatbelts more to avoid getting tickets. One participant explained: “I thought my record is clean and I should keep it clean, and so I should put on my seatbelt. I didn’t think about safety because it was late and the roads

were empty.” This does not mean that these participants value material costs more than their safety, but perhaps they have more faith in their driving and think accidents are more avoidable than police tickets. This is only one possible explanation and more research is needed to better understand this outcome.

Note that there was never a case in which a participant actually addressed the tradeoffs issue and then decided against using his seatbelt. In fact, in the cases in which participants did not use their seatbelts, the tradeoffs issue did not appear to be addressed explicitly at all. Often it seemed that the participant failed to use his seatbelt because he took an obliviousness approach to the need issue. That is, he recognized no threat or opportunity that induced him to make a decision about using or not using his seatbelt, and the default action was to not use his seatbelt.

Aftermath Issues

Spot Decision Issue 9—Acceptability. While most participants reported that family members cared about the consequences that could result from their decision to use or not use a seatbelt (value issue), most participants did not think, at the time of the trip, that anyone besides themselves would have cared one way or another about the seatbelt use decision. There were a few cases in which participants actually mentioned either their families or the passenger(s) who were with them at the time, in which cases the issue was addressed with the decision to wear the seatbelt.

Spot Decision Issue 10—Implementation. As these are split-second, “spot” decisions, with the seatbelt use behavior happening at the same time as the decision, the implementation issue was not acknowledged by participants. That is, because the action

follows immediately after the decision, there is little opportunity for implementation to fail.

3.3.6 Qualitative Exploration of the Video Data

This last analysis task entailed a qualitative, unstructured, exploratory examination of the remaining video data that was not used in the interviews. This examination was of the ethnographic type, with the aim of identifying any cues that may add to the understanding of how these young adult participants made their seatbelt use decisions. Below I present the most “interesting” cases which seem to highlight potential trigger of seatbelt use and nonuse (e.g., passenger type, passenger interactions and conversations, and multi-tasking).

3.3.6.1 Passenger Type

It was somewhat peculiar that the presence of passengers increased seatbelt use. If anything, one would think that young male drivers would actually loosen their seatbelt behavior in the company of others, particularly peers. Thus, I have looked more closely at the video footage in an attempt to explain this influence, with the idea that perhaps the type or relationship of passengers moderated this influence. That is, my expectation was that the passenger effect on seatbelt use would be positive for “family passengers,” but negative for “peer passengers.”

Qualitative analysis of the video data for trips in which there were passengers provided *some* support for this effect. Participants varied considerably in seatbelt use with passengers, but there was less variation when the passengers appeared to be family members. For example, one participant (overall seatbelt use rate = 3%; seatbelt use rate

in the presence of passengers = 17%) made 93 total trips, twelve of them with passengers. Of those twelve trips, two were with his mother and ten were with his friends. This participant only used his seatbelt on two trips for the duration of the study, and they were the two trips when his mother was riding with him; she was also belted. Incidentally, the “friend” passenger used his seatbelt on only one of the ten trips.

Although this participant was an outlier in terms of having the lowest seatbelt use rate, the effect of passenger type on seatbelt use highlighted from seatbelt use behavior was well represented in similar cases for the other participants. Participants seem to use their seatbelts on trips in which parents, older siblings, and younger siblings were passengers.

These findings were consistent with national seatbelt use surveys, which found seatbelt use of adolescents and young adults to be lower (80%) in the presence of passengers of the same cohort (16-24 years) and higher (87%) in the presence of younger/older passengers than when driving alone (81%; NHTSA, 2010b).

3.3.6.2 Concurrence with Other Risk Behaviors

Review of the video data revealed a noteworthy prevalence of distracted driving (i.e., driver multitasking while driving). One participant (overall seatbelt use rate = 100%; seatbelt use rate in the presence of passengers = 100%) had particularly revealing video data in terms of the relationship of seatbelt use to other multi-tasking and other risk behaviors. Basically, he always wore his seatbelt, in spite of so many contextual cues that one would think might have disrupted seatbelt use. For example, he had frequent

driving trips in which he and his passenger friends were smoking and listening to loud music, clear examples of adolescent entertainment behavior, except everyone had their seatbelts on. On one trip, the passenger enters the vehicle, and immediately put on his seatbelt and lights up a cigarette. On another trip, another passenger enters the vehicle with a cigarette and immediately puts the seatbelt on. And on another trip, the participant was texting, smoking, and driving, but of course with the seatbelt on. In fact, even when he was not texting, the cell phone is seen in other videos placed on the participant's lap, instantly ready for use during driving. Also noteworthy is that this participant, on another trip, kept his seatbelt on while ordering from a drive-thru. What this driver's data suggest, basically, is that seatbelt use, at least among a segment of drivers, is independent of other risky driving behaviors (e.g., texting while driving). This idea challenges assumptions that group a multitude of risky behaviors to general risk-seeking tendencies of adolescents, all attributed to incomplete cognitive development.

Incidentally, this participant did not report having established a seatbelt use policy, never mind a full seatbelt use policy. This brings up an important note about the degree of self-insight these young drivers have about their decision making. The interviews certainly facilitated their meta-cognitive abilities, but perhaps it was still limited, particularly since it was limited to a one-time 2-hour interaction. Had the "interviews" been longer and more recurrent, as is the case usually with ethnographic data collection, it would have provided for more opportunities for participants to explain their decision processes, and which might have subsequently provided for more complete data for this study.

3.3.6.3 Disruption of Seatbelt Use

One participant (overall seatbelt use rate = 95%; seatbelt use rate in the presence of passengers = 97%) was seen unbuckling mid-trip, while the car was idling, in order to clear up the passenger seat as he was picking up two passengers, who appeared to be friends. He resumed driving without putting the seatbelt back on. The passengers were not buckled either. This is a participant who seemed to have no issue with using his seatbelt in the presence of unbuckled passengers. This suggests that his partial seatbelt use on this trip is perhaps a result of him *forgetting* to put the seatbelt back on.

CHAPTER 4

CONCLUSIONS

In this dissertation, I synthesized key insights from two established perspectives—risk management and the cardinal issue perspective on decision making—with empirical findings from a rich set of naturalistic driving and seatbelt use data, to generate a set of conclusions intended to explain, and provide suggestions for influencing, how people manage the personal risks they encounter on daily bases. Below I present a plausible integration of these key insights as well as recommendations for improving the effectiveness of personal risk management decisions.

4. 1 Episodic Variation in Personal Risk Management

In this section, I present a summary of the most common episodic variations in how people manage their personal risk, in the case of seatbelt use, and which I later show is *ineffective* management of personal risks.

Empirical data from the driving study revealed variation of seatbelt use by three important trip conditions: length of trip (short vs. long), time of trip (day vs. night), and whether the driver was accompanied by any passengers. Seatbelt use was higher for long trips, daytime trips, and trips in which there was at least one passenger.

Short trip length was a consistent factor in discussions of seatbelt use policy and spot decisions, even to the extent that some participants had policies that only called for

seatbelt use on long trips. The reasons for not using a seatbelt on short trips generally entailed the lower perceived risk of an accident or seatbelt ticket. While drivers are indeed correct in calculating that the odds of accidents and police tickets increase as a function of trip length (and trip time, and speed), efforts should be made to increase their awareness of the fact that accidents, for example, can and often do occur on short trips. Moreover, it is not out of the question that short trips could also entail other characteristics that increase “risk” from the other factors, such as, say, being in a rush hopping from store to store getting those last-minute Christmas gifts, thus making a series of back-to-back “short” trips that may well entail more risk than one trip of the combined distance. This is consistent with research on cumulative risk, which suggests that while the risk of, say, a fatal accident in one trip is extremely small, the cumulative risk across many trips is considerably more significant (Nell, 1985).

As for time of day variations, the seatbelt data do not provide as clear an explanation as to why seatbelt use was higher during the day. Some participants suggested that they feel more vulnerable to police tickets during the day and subsequently use their seatbelts more often to avoid being ticketed. Others said that they put on their seatbelts because it was late at night and they were tired and more likely to get into accidents. The data do suggest, nevertheless, that these variations are can be attributed to episodic variations in the perceived risks of either getting into accidents or being stopped by police.

It is no coincidence that the word “accident,” with all its connotations, can also apply to other domains of risk management, namely, sexual behavior. In fact, this risk-

based class of episodic variation in seatbelt use has its parallels in other domains of personal risk management. In sexual behavior, young males tend to show inconsistencies in their condom use across different episodes of sexual behavior (CDC, 2010). It is plausible that these intrapersonal variations are also influenced by episodic variations in people's risk probability calculations.

Passenger effects on seatbelt use, regardless of their direction, are fundamentally different from the other episodic variations discussed above. Whereas trip length and time of day might influence the risk, or at least perceived risk, of accidents and police tickets, the presence or absence of passengers seems, for the most part, less concerned with risk management and more with social dynamics (e.g., social influence, peer influence, etc.). Only one participant actually argued that his seatbelt use behavior in the presence of his younger siblings would, in turn, influence *their* seatbelt use and therefore their safety. To the extent that both social and risk related passenger effects exist, both have relevance for the other domains of personal risk management. The *social* variety implicate increased smoking, and to some degree sexual behavior in the presence of peers, to look cool. The *risk* variety might implicate reduced smoking, and sexual behavior due to the risks of second-hand smoking and sexually-transmitted infections, respectively.

4.2 The Benefits of Good Policy Decisions

4.2.1 Outcome: Good Policies Bring Good Behavior

The empirical data on seatbelt use show that having seatbelt use policies was associated with higher seatbelt use only if those policies called for *always* using seatbelts,

i.e., policies that do not permit episodic variations. In fact, participants with policies that called for seatbelt use only under certain conditions used their seatbelts less often than even those with no policy at all. This finding was perhaps not surprising given that most part-time policies included some provision for not using seatbelts on short trips and given that people with these policies tended to take more short trips. Still, these are ineffective policies. Indeed, it is not just having a policy that leads to more effective personal risk management, but having the *right* policy. More in depth consideration of the implications that effective policies can have on the archetypes of personal risk management will be presented in section 4.3, below.

4.2.2 Need: Why Good Policies and Habits Are More Effective Than Risk Awareness

The data on seatbelts use show that although perceived risk of getting into an accident or being pulled over for seatbelt nonuse were considered in some of the policy and spot decisions, there were clearly other factors that were critical in influencing participants' seatbelt use decisions that had little if anything to do with risk perception, namely, policies and habits, as discussed above.

Refer back to the first cardinal issue—Need. Recall that addressing the need issue entails recognizing whether or not “there is an opportunity or a threat approaching which warrants an effort to decide how to deal with it,” that, in this case, it requires one to recognize the need to make a policy decision. In fact, the seatbelt use data show that none of the participants who reported having no policy actually made a conscious

decision not to have one. Rather, they attributed their lack of a policy to the fact that they never even *thought* about the need to establish such a policy.

There is no doubt that high risk awareness, to the extent that it is salient, can *trigger* the perceived need to make a decision, and even an effective one for that matter. However, no amount of risk awareness can influence risk management if the need issue is ever mishandled, which is likely to happen in spot decisions given the myriad other things occupying people's minds. Thus, the key is not only in the degree of risk awareness, but in recognizing that a risk management decision ought to be made, and particularly, at the policy level.

4.2.3 Mode: Establishing Good Habits

Another benefit of having effective policies is that they can reinforce rule-based approaches to the mode issue of a decision process. This is useful in itself because rule-based approaches are more efficient, and given the correct rules, can also lead to better outcomes. But it is particularly useful because repeated use of rule-based approaches can automatize, and lead to an even more efficient and effective form of decision making—habits. To that extent, good habits can be conceptualized as an extension of personal risk management policies, and ultimately an ideal approach to personal risk management.

The significance of habit as a non-risk factor influencing seatbelt use decisions, in the seatbelts study, emerged during discussions of spot decisions, specifically in addressing the need issue. Most participants who had their seatbelts on said that they just had it on out of habit, not through a conscious decision to put it on. Similarly, many participants with a full-time seatbelt use policy attributed their spot decisions to habit.

Moreover, most participants who did not use their seatbelts also pointed to habit. They said that they did not make a conscious decision to not wear their seatbelt, but just did not think of wearing it. This raises the significant point that habit is only good if the habitual behavior is positive (i.e., intended on reducing risk). This speaks directly to the influence of policies on outcome, previously discussed.

Incidentally, the mode issue can also explain the development of habits—good or bad—via repeated spot decisions, as opposed to policies. Refer to the discussion of the mode in its first presentation, in Chapter 2, particularly the section on episodic and developmental sequences of mode approaches. The key insight here is that spot decisions matter, particularly early ones. This points to the significance of considering adolescents and young adults as a special segment of the population, since, as discussed in Chapter 1, people’s first encounters with risks and risk management in pretty much any personal domain occurs during adolescence. That is when the first spot decisions are made, and is also the first opportunity to establish policy decisions.

Many personal risk management domains have some sort of early educational intervention programs aimed at improving that particular domain of risk management: health education, sex education, and driver’s education. The latter might be the most effective of the three, at least in encouraging seatbelt use, perhaps because it is the only one incorporated into a licensing process. Driver’s education, which was often mentioned explicitly by participants in the seatbelts study as a contributor to seatbelt use in various cardinal issues discussions, can indeed play a key role in establishing good habits, along with parenting and other influences (e.g., media). Findings from this

dissertation research can also strengthen the effectiveness of education programs. Specifically, insights from implications of the need issue on policy decisions, above, suggest that intervention programs in any domain of personal risk management should not only focus on risk awareness, which they currently do quite well, but also on the utility of establishing effective risk management policies and habits. For example, rather than tire adolescents with risk messages about unsafe sex (which most know anyway), it would seem more effective to show them the utility of establishing safe sex policies early on, and not having to make those decisions at the spur of the moment.

4.2.4 Investment: Eliminating the Costs of Spot Decisions

Policies can free people from the necessity, and effort, of having to make personal risk management decisions on case-by-case bases, and in doing so also avoid making the wrong decisions. Seatbelt use data suggest that most people are unaware of the investment costs associated with spot decisions, let alone the outcome costs of making bad spot decisions. Thus, it seems imperative for any efforts to improve personal risk management decisions to emphasize the significance of these investment benefits, in regards to both process as well as outcome.

4.3 Effective Personal Risk Management Policies in the Three Archetypes

To the extent that an understanding of the decision process entailed in seatbelt use can be adapted to the other domains of personal risk management, it is important to discuss how seatbelt use is similar to and also *different* from, say, smoking and sexual behavior. In doing so, I refer back to the risk management strategies and the cardinal issue perspective on decision making, including the distinction between spot and policy

decisions, discussed in Chapter 1. I also use insights from these two frameworks in presenting plausible effective personal risk management strategies in each of these domains. First, the differences:

Smoking is a risky behavior in itself. Thus, the only effective strategy to manage its risks is to avoid it altogether. That is, one should *not* smoke. The reduction strategy cannot be applied to reduce the hazards of smoking, as no methods exist that can make smoking less risky, as is, for example, in the case of sex and driving. Indeed, smoking two cigarettes a day entails less risk than smoking two packs a day, but that distinction derives from “reducing” the smoking behavior itself, which more closely falls under the avoidance strategy.

Sexual behavior is a behavior that *entails* risk. There are two effective ways of managing those risks. One can avoid them, like with smoking, and just not engage in any sexual activity. Some people do choose that strategy, at least with regards to pre-marital sexual behavior. However, there is also a more practical, and hence *effective*, strategy, namely, to *reduce* those risks. Reduction allows for engaging in the risky action, along with taking steps to reduce, or “mitigate” its risks. In this case, it would mean practicing *safe sex*. This sort of risk management is possible for sexual behavior, but not smoking. Implications of this distinction for smoking policies, as well challenges in the case of sexual behavior policies, will be presented in the next section.

Seatbelt use is more precisely analogous to *safe* sexual behavior. The risk is not in seatbelts, but in driving. Driving and sex and are also similar in that both can be

avoided, at least in principle, as a means of avoiding their risks completely. As noted earlier, this is a viable strategy for avoiding the risks inherent in sex. Avoiding driving, however, does not present itself as a practical option for managing its risks. Rather, the most effective strategy in this case would be to *reduce* its risks, by means of seatbelt use. As in the case with sexual behavior, reduction strategies do not eliminate the risk, but reduce it to a degree that makes the behavior relatively safe (e.g., safe sex and using the seatbelt while driving).

Indeed, efforts should be made to get adolescents and young adults, and all people for that matter, to establish effective policies in all the domains of personal risk management. That said, it is important to consider two key challenges specific to the domains of smoking and sexual behavior:

4.3.1 Challenges in Implementing Risk Management Decisions for Smoking and Sex

Unlike the other archetypes, effective management of the risks of smoking does not permit the use of any tool or intervention to reduce its risks, as is the case with driving and sex (i.e., via the use of seatbelts and condoms). The only effective policy in the case of smoking is to *not* smoke at all. Any policy that allows for limited smoking, such as social smoking, might reduce the harm of tobacco in that it reduces exposure to it, but is nevertheless ineffective as a strategy because it does not reduce its harm.

Incidentally, the tobacco industry does attempt to promote such a strategy, by marketing products with supposedly *reduced* hazards built in, as in the case of cigarettes labeled “light” or mild.” A law banning this practice went into effect in 2010, highlighting the U.S. Food and Drug Administration’s position that light cigarettes have

no risk advantage over the regular variety, and that the only way to reduce the risks from smoking is to stop smoking completely (National Cancer Institute, 2010).

The most effective policy for managing the risks entailed in sexual behavior is to always practice *safe sex*. Avoidance (e.g., abstinence) is in fact the most conservative, albeit not as practical. Still, even with reduction policies (e.g., condom use), the cardinal issue perspective on decision making points to the potential for significant challenges to arise in the implementation stage (e.g., the passion of the moment might make it difficult to execute effective decisions, particularly of the spot variety. Sexual arousal implicates, and can, in fact, impair resolution of multiple cardinal issues as well. Hence it presents itself as a serious practical consideration unique to the nature of sexual behavior. Similar challenges might arise in other domains not explicitly addressed in this dissertation, such as illegal drug and alcohol use.

Adding to those challenges is that effective risk management policies often come at cost of frustrating arguably significant needs that would otherwise be served by, say, smoking and unprotected sex. Smoking, for example, is often associated with stress reduction, mood stimulation, and appetite suppression (Ropeik & Gray, 2002).

Moreover, regular smokers often crave nicotine. This makes implementation of risk management strategies in the case of smoking particularly challenging, and even more so in cases that involve addiction. Similarly, unprotected sex is often perceived to be more pleasurable than a protected sex. Thus, it is unquestionable that effective risk management strategies in these domains must address the various needs that are often said to be served by the respective behavior.

There are indeed various approaches that address these challenges and can make risk management interventions more effective. For example, tobacco cessation strategies often involve products that give individuals some satisfaction of the needs that they would otherwise be served by smoking, namely, nicotine, as in the case of skin patches, chewing gum, and lozenges. These products supply the body with controlled amounts of nicotine to ease the difficulties of nicotine craving and withdrawal (Food and Drug Administration [FDA], 2011). Similar approaches are considered when managing the risks of sexual behavior, as in the marketing of ultra-pleasurable condoms intended to counteract the perceived decrease in pleasure associated with protected sex (Randolph et al., 2007).

Management of the risks entailed in sexual behavior can also have other implications. For example, cultural customs and religious beliefs might pose certain challenges to condom use, or to protected sex altogether (whereby they might only permit avoidance as a strategy). To the extent that avoidance is sometimes encouraged as an effective policy, alternative methods of achieving sexual pleasure ought to be considered to ensure that individuals can indeed implement avoidance decisions.

As for the case of driving, it seems that these concerns are significantly less relevant, if relevant at all. Empirical data from the seatbelts study do not point to any disadvantages associated with seatbelt use. While some participants did acknowledge discomfort as a possible tradeoff in seatbelt use decisions, there was no indication that it received any significant consideration. That said, efforts to design seatbelts that are more comfortable and socially desirable (somewhat like the harnesses found in racing cars)

might indeed compensate for any discomfort or social cost associated with consistent seatbelt use.

4.4 Future Directions

Understanding how people manage their daily risk decisions is a major concern to society. To that extent, I have presented key conclusions intended to explain, and provide suggestions for influencing, how people manage the personal risks they encounter on daily bases, shaped by insights from the cardinal issue perspective on decision making and risk management. These recommendations can be applied and tested in various domains of personal risk management. For example, it would be wise for intervention programs, particularly early education programs, to incorporate the cardinal issue perspective into their classes or booklets. Adolescents and young adults would benefit from understanding that risk decisions, whether they be in health or traffic safety, entail 10 cardinal issues that need to be addressed as well as possible, and that making good policy decisions can go a long way in improving their risk management.

At another level, this dissertation perhaps can inspire new research programs that investigate the mechanisms, not just *influences*, of personal risk management decisions. The findings presented here point to the need for future research to go beyond risk perception in explaining risk-related decisions, and give closer attention to other basic components of decision processes, namely, the cardinal issues. Moreover, new research programs can benefit from investigating the mechanisms of, and influences on, *policy* decisions in particular. The conclusions presented here support the utility of correct policy decisions, and present one approach to establishing them (namely, via repetition of

good spot decisions). More research is needed to further investigate *how* these policies can and ought to be established. Culture, for example, seems to be one plausible factor for influencing personal policies. Other influences could also come from experience (e.g., significant events and/or habituated spot decisions) and upbringing (e.g., family norms). Research in these directions can contribute to a more complete understanding of, and a more effective approach to improving, how people manage the significant risks encountered on daily bases.

Finally, it is important to step back and realize how significant are the implications for effective personal risk management. Established organizations are aware of the need for risk management because they need to exist for generations beyond the demise of any of the individuals running them presently. Individuals, on the other hand, should also invest in good personal management strategies and strive to reduce, if not eliminate, the significant risks they encounter daily in the most consistent and efficient ways possible. Establishing good personal policies, for example, can go a long way in saving lives, and at costs that are far below what it takes for people to go about their lives making hasty spot decisions that sometimes hit and sometimes miss.

APPENDICES

Appendix A

Interview Guide 1

Participant _____

SPOT SEATBELT DECISIONS

Structured Interview: Subject shown video and asked to describe his thinking and to respond to specific questions concerning his use or non-use of his seatbelt. Code responses for how subject addressed each cardinal issue. Analyst may stop video at points of interest (if identified in the pre-interview viewing of the video) and ask questions to clear up specific ambiguities about how the subject resolved particular cardinal decision issues.

“Welcome and thank you once again for taking part in this study. We have looked at the videos from your driving and would like to share and discuss with you some of those videos. As we are watching, our focus will be on various specific aspects of your decision to use or not your seatbelt. In general, I would like you to describe what you were thinking in terms of the seatbelt—your train of thought. I will also ask you some more specific questions about that. If, at any point you would like to stop the video, say, to collect your thoughts, please just say ‘Stop.’ Do you have any questions? Let’s begin.”

SPOT DPA – SUBJECT # _____ CASE # _____ Trip # _____

Trip Date _____ Time _____ Segments/Distance _____

Seatbelt Decision (circle one): *Used belt (B) Didn’t use belt (NB) Part Time Belt (PTB)*

Passengers: Number _____ Relationship _____

Time of trip: Day / Night Type of trip: Local / Highway

“On this trip, you will recall, you (never) used your seatbelt. To refresh your memory of the trip, let’s look at the first few seconds of the video.” [The analyst shows the first 15 seconds (approx.) of the video, or until the subject remembers the trip, then continue onto the questions, while the video is playing, with the audio lowered to reduce distraction.]

Issue 1—Need: *“Is there some threat or opportunity here that should compel me to make a decision about whether to wear my seatbelt?”*

Q1 NEED: *“As clearly as you can, please tell me what, if anything, you were thinking at this point that might conceivably be related to using a seatbelt.”*

“Did the possibility of using your seatbelt in fact cross your mind? Please explain.”

“As best as you can recall, what do you think were the reasons that the possibility of using your seatbelt came to mind?”

Note: If the possibility of using a seatbelt never came to mind (or, “obliviousness”), we know that the decision was not analytic or rule-based but instead experience-based. The interview could stop there.

• **Trip interview coding: 1—Need:**

Strategy*	Observation Category	Check (If Present)	Specific Indication
1: Obliviousness	a: Never mentions belt		
	b: Never apprehends belt, e.g., looks at, touches		
	c: Performs incompatible tasks, e.g., uses phone		
	d: Other (specify) (could include “automatically” putting on belt)		

2: Vigilance	a: Deliberately apprehends belt, e.g., looks at, touches		
	b: Purposely looks around outside car, e.g., at traffic		
	c: Mentions belt		
	d: Mentions assoc. risk—accident, police, others		
	e: Other (specify)		
3: Demand/response	a: Other party mentions belt		
	b: Other party mentions related risk, including regarding belt		
	c: Other “party” (e.g., buzzer system) or condition (e.g., weather) “requests” belt/no belt		
	d: Other (specify)		

***Obliviousness:** the person makes no attempt to detect possible impending opportunities or threats that would warrant an effort to decide how to address said opportunities or threats via using a seatbelt; **Vigilance:** the person makes a purposeful attempt to detect possible impending opportunities or threats that would warrant an effort to decide how to address said opportunities or threats via using a seatbelt; **Demand/response:** the person is subjected to a request or demand to make a decision to either use or not use a seatbelt.

Issue 2—Mode: “Who should I get involved in making this decision about whether I will wear my seatbelt now, and who will **actually** get involved? What approaches will these people—including me—adopt in making this decision?”

Q2 MODE: “Please tell me about who else, if anyone, had a role in your decision to wear or not you’re your belt here, whether that person was physically present or not. How about any ‘thing’ that might have been involved, too, such as a source of information or some kind of device or tool?”

Q2b: So, you said that you made the decision yourself about whether to use your belt in this instance. As best as you can, would you describe how you made that decision? Would you elaborate?

[Might need to ask ‘probe’ questions, to be able to fill the approach table below]

- **Trip interview coding: 2—Mode:** [Code standard decision process roles—self, agent, consultant, model—and standard approaches adopted by the participants in those roles—analytic, rule-based, experience-based:]

Role: Who/What*	Involvement/Approach (Analytic/Rule/Experience)**	Specification/Details
Self/Driver		
Agent(s) (e.g., decide for driver) (1 line for each; note whether companions present)		
Consultant(s) (e.g., advice, including buzzer) (1 line each)		
Model(s) (e.g., first “demo”) (1 line each)		

***Roles: Self/driver:** the legally authorized seatbelt-use decision maker; **Agent:** decides for authorized decision maker, the driver, e.g., engages seatbelt for driver, of own initiative; **Consultant:** gives advice, input, e.g., asks or tells driver to put on or not put on belt, and why; **Model:** makes own decision prior to driver’s seatbelt decision, which the driver then appears to observe and mimic.

****Approaches: Analytic:** thinks through problem from “scratch,” first principles, anything that “works”; **Rule-based:** invokes rule thought to be applicable; **Experience-based:** “habit,” “learned”

Issue 3—Investment: *“What should I spend—in time, aggravation, or anything else—in figuring out whether to put on my seatbelt right now?”*

Q3 NEED: *“Would you please tell me how much effort, time, or anything else you spent in thinking about whether or not to wear your seatbelt here?”*

“As best as you can, please tell me how you arrived at that amount of effort, time, or whatever, rather than, say, something less or more.”

• Trip interview coding: 3—Investment:

Consideration*	Check (If Apparent)	Specific Indication(s)
Costs/resources of any kind		
Principle 1: Limits		
Principle 2: Reducible Decision Risk		
Principle 3: Decision Planning & Budgeting		
Principle 4: Minimization		

***Consideration: Costs/resources of any kind:** subject appears to take into account any costs or resources expended in the process of deciding whether to use the seatbelt, e.g., mentions aggravation over having to decide; **Principle 1: Limits:** subject appears to consider the importance of the decision relative to the burden of making that decision, e.g., mentions whether (not) worth the effort of deciding (not the effort of executing the decision, i.e., putting on the belt); **Principle 2: Reducible Decision Risk:** subject appears to believe that the quality of the resulting seatbelt decision was or was not responsive to the kinds and amounts of resources devoted to the decision process, e.g., “it doesn’t matter how hard I think about it ...”; **Principle 3: Decision Planning & Budgeting:** subject appears to lay out a plan for making the seatbelt decision, along with means for covering the costs associated with carrying out that plan; **Principle 4: Minimization:** subject appears to make a deliberate attempt to minimize the costs of making the seatbelt decision.

Issue 4—Options: *“What are potentially ‘reasonable’ alternatives for dealing with this problem of whether or not to wear my seatbelt right now? How could I go about identifying or creating such options?”*

Q4 OPTIONS: *“In this situation, as you indicated, you considered either using or not using your seatbelt, right? (Pause) Were there other alternative actions you considered taking besides those?”*

“What are those other alternatives?”

“As best as you can recall, what did you do to bring those alternatives to mind? What made you think of them?”

• Trip interview coding: 4—Options:

No. of Options Recognized (Check)	1	2	3+ (Specify): _____
Specific Indications of Recognized Options			

Note: Beyond simply fastening the seatbelt and not fastening the belt, other options might include ones such as various kinds of evasion, e.g., fastening the belt and then sitting on it.

Creation/Identification Approach*	Check(If Apparent)	Specific Indication(s)
Waiting		
Exhortation		
Invitation		
Consultation		
Emulation		
Exhaustive Search/Generation		
“Brainstorming”		
Derivation		

***Approaches:** **Waiting:** subject appears to passively wait for options to present themselves; **Exhortation:** subject urges self and/or others to work hard to identify or generate options ; **Invitation:** subject invites others to suggest options; **Consultation:** subject seeks out others to recommend options, under the assumption that they have pertinent expertise for doing so; **Emulation:** subject observes how others address similar problems, apparently successfully, and pursues the options they pursued; **Exhaustive Search/Generation:** subject attempts to identify “all,” or at least large numbers of, viable options; **“Brainstorming”:** subject attempts to use a collection of people to identify or generate options, exploiting their multiple perspectives; **Derivation:** subject attempts to create viable options based on a presumed understanding of how things work in the pertinent arena.

Issue 5—Possibilities: *“If I were to wear my seatbelt on this trip, what are the various important things that could happen as a result? Similarly, if I were to NOT wear my belt, what are the important potential consequences? What are good ways to make sure that I actually bring the important possibilities to mind as I ponder what to do?”*

Q5 POSSIBILITIES: *“As you were thinking about whether to wear your seatbelt in this situation, what possible consequences of not wearing your bet crossed your mind?”*

“Similarly, what potential consequences of wearing your seatbelt came into your thinking?”

“As best as you can recall, what made those specific possible consequences enter your mind? What, if anything, did you do to bring them to mind?”

• Trip interview coding: 5—Possibilities:

Specific Possibilities Acknowledged (None specified → N = 0)	Indication(s) (e.g., via Utterances)
1:	
2:	
3:	
4:	
5:	

Approaches Used for Surfacing Possibilities	Indication(s) (e.g., via Utterances)
Consultation: Non-Experts (e.g., Peers)	
Consultation: Experts	
OPO Cycles (or Similar)	
Delay (e.g., “Sleeping on It)	
Deliberate Recall of Experiences Effort	
Derivation of What Makes Sense	
Other (Specify)	

Factors Plausibly Affecting Surfacing of Possibilities*	Indication(s) (e.g., via Utterances)
Aim Contentment	
Experience/Inexperience	
Stress	
Time Limitations	
Physical Prominence	
Companion(s)	
Temporal Immediacy	
Other (Specify)	

***Aim Contentment:** subject has achieved the aims of the original decision (e.g., getting to a particular place) and thus no attempt is made to surface possibilities;

Experience/Inexperience: subject benefits from experience in similar situations or is inhibited from the lack thereof; **Stress:** subject’s attention is restricted by the influence of stress; **Time Limitations:** subject has little time to devote to efforts to surface possibilities; **Physical Prominence:** subject’s efforts to surface possibilities are limited by attention being occupied by physically prominent stimuli; **Companion(s):** subject’s attention to particular possibilities is affected by companions’ actions, including their

mention of possibilities; **Temporal Immediacy:** subject’s attention is preoccupied by possibilities that would emerge in the near vs. remote future.

Issue 6—Judgment: *“It occurred to me that, if I use (don’t use) my seatbelt on this trip, one possible consequence would be _____ (e.g., getting seriously injured in an accident). What would be the chances that that actually **would** happen if I use (don’t use) my belt?” (Similarly for all the remaining possibilities acknowledged.)*

Q6 JUDGMENT: *“A few moments ago, you mentioned (several) things that you thought could happen if you used your seatbelt and if you didn’t. I’m going to remind you of each one. For each, please tell me, as best as you can, what you that its chances were.”*

• **Trip interview coding: 6—Judgment:**

Specific Possibilities Acknowledged	Estimated Inferred Judged Probability (0% - 100%), Per Specified Indication(s)	
	Seatbelt Used	Seatbelt Not Used
1:		
2:		
3:		
4:		
5:		

Issue 7—Value: *“I have envisioned a number of possible consequences of driving on this trip with (without) my seatbelt fastened. For each of them, how much would I and anyone else involved really care about those consequences if they actually came about?”*

Q7 VALUE: *“Again for those same possible consequences of driving on this trip with or without the seatbelt fastened that you mentioned earlier, how much would you and anyone else involved really care about those consequences if they actually came about?”*

• Trip interview coding: 7—Value:

Specific Possibilities Acknowledged: Significant to the Subject	Value		
	Valence (+/-)	Level (Indiff, Little, Mod, Great Deal, Much As Poss)	Indication(s)
1:			
2:			
3:			
4:			
5:			

Specific Possibilities Acknowledged: Significant to Another Key Party (e.g., Passenger, Family; Specified)	Value		
	Valence (+/-)	Level (Indiff, Little, Mod, Great Deal, Much As Poss)	Indication(s)
1:			
2:			
3:			
4:			
5:			

Issue 8—Tradeoffs: *“I am faced with two (or more) possible actions for this trip. I could either wear my seatbelt or not. Each of these actions has both strengths and weaknesses compared to the other. So if I take one action, I get all its relative advantages but give up all the relative advantages of the other. So, in view of all this, which action should I take?”*

Q8 TRADEOFFS: *“So you were faced with at least two possible seatbelt-related actions for this trip: Wear, not wear, etc. Each of these actions has both strengths and weaknesses compared to the others. So if you take one action, you get all its relative advantages but give up all the relative advantages of the others. What did you see as the strengths and weaknesses of these alternatives?”*

	Action		
	Use Seatbelt	Not Use Seatbelt	Other Specify: _____
Advantages			
Disadvantages			

How did you think through those relative advantages and disadvantages and then somehow concluded that you should either use your seatbelt, not use it, or something else?

[Might need to ask ‘probe’ questions, to be able to fill the approach table below]

- **Trip interview coding: 8—Tradeoffs:** *[The analyst codes the subject’s indications of the approach he took to dealing with the fact that none of the recognized options—wear seatbelt, don’t wear seatbelt, other—dominated its competitors, i.e., was at least as good with respect to every consideration that mattered, per the following table:]*

Approach*	Indication(s)
Dominance Striving	
Noncompensation	
Compensation: Importance Weighting	
Compensation: Other	
Other (Specified)	

- ***Dominance Striving:** subject seeks to improve one or more of the alternatives to reduce the amount that would have to be sacrificed to pursue it;
- Noncompensation:** subject concludes that one set of advantages (disadvantages) are so critical that they cannot be offset by opposing disadvantages (advantages); **Compensation: “Importance” Weighting:** subject feels that the “importance” of the advantages on one side more than offset the importance of those on the other; **Compensation: Other:** subject uses some other scheme whereby an alternative’s relative strengths can offset its relative weaknesses.

Issue 9—Acceptability: “*On this trip, I would either use my seatbelt or not. Besides me, who would care one way or the other what I choose to do (and **how** I make the choice), and what could and should I do about their opinions?”*

Q9 ACCEPTABILITY: “*On this trip, you knew that you would either use your seatbelt, not use it, (or do something else entirely). Besides you, who else do you feel, at the time, would have cared one way or the other what you chose to do and how you arrived at your choice?”*

What, if anything, did you consider or actually plan to do about how this (these) persons felt?”

• **Trip interview coding: 9—Acceptability:**

Objection Consideration*	Acknowledged (Y/N), and Who Specifically**	How Addressed***	Indication(s)
Who			
Why			
Risk			
Prevention			
Other			

***Who:** who might object to either the subject’s decision or how he made it; **Why:** why a particular potential objector might object; **Risk:** how capable and willing the indicated objector could and would seriously harm the intended beneficiaries’ interests if displeased; **Prevention:** measures that could be taken to prevent the consequences of the objector’s displeasure if not the his/her objections themselves.

**Whether the subject acknowledged the consideration.

***How the subject addressed the consideration: Who—how the subject sought to identify potential objectors; Why—how the subject sought to determine why the potential objectors might object; Risk—how the subject sought to assess the risk posed by the prospective objections; Prevention—measures the subject took to trying to preclude or deal with the consequences of the prospective objections and how the subject sought to identify or create those measures.

Issue 10—Implementation: *“I’m considering using (not using) my seatbelt on this trip. Is it reasonable to anticipate difficulties actually carrying out that action, if I were to select it? What, if anything, could I do to deal with those difficulties?”*

Q10 IMPLEMENTATION: *“When you were considering whether to use your seatbelt, not use your seatbelt (or do something else entirely), what were your thoughts, if any, about whether and how you could actually carry out the action you chose? Please explain.”*

• **Trip interview coding: 10—Implementation:**

Option 1: _____		
Anticipated Difficulty*	How Would Be Addressed**	Indication(s)
1:		
2:		
3:		
4:		
5:		

*If nothing is entered, this indicates that no difficulties were acknowledged.

**If nothing is entered, this indicates that no means for addressing the difficulty were brought to mind.

Option 2: _____		
Anticipated Difficulty*	How Would Be Addressed**	Indication(s)
1:		
2:		
3:		
4:		
5:		

*If nothing is entered, this indicates that no difficulties were acknowledged.

**If nothing is entered, this indicates that no means for addressing the difficulty were brought to mind.

APPENDIX B

Interview Guide 2

Participant _____

POLICY SEATBELT DECISIONS

“Now we are going to talk about your seatbelt use generally rather than in reference to any specific driving occasion such as those we talked about earlier.”

Rule Use

Q1: “Do you follow some kind of rule about whether to use a seatbelt when you are driving?”

If subject is silent or unsure how to respond: *“Let me try to put the question a slightly different way with an example: Do you, for instance, have a rule in your head which says something like: ‘If so-and-so conditions exist, then I will use my seatbelt; otherwise, I won’t.’”*

Yes: Go to Q1a.

No: Go to SERIES “NO”

Q1a: “I see. Would you explain and elaborate on your seatbelt use rule? Please help me understand how your rule works.”

Q1b: *“Thanks. My next question: How often or consistently would you say that you actually follow your rule? Would you say: ‘Almost Never,’ ‘Occasionally,’ ‘Usually,’ or ‘Always, Without Fail’?”*

If not ‘Always, Without Fail’: *“On the occasions when you don’t follow your rule, why does that happen? That is, what prevents you from following your rule?”*

Go to **SERIES “YES”**

SERIES “NO”

*“You just said that you don’t try to follow any kind of rule about whether to use a seatbelt when you are driving. Have you ever **considered** setting a rule like that?”*

No: Go to **END**

Yes: Continue

“So, I take it that you thought about establishing a rule about using your seatbelt but decided against making such a rule. Right? The purpose of my next series of questions is to understand how you arrived at that decision.”

Policy QN0: *“First, in your own words, would you please explain to me how and why you decided that you would **not** establish a rule about when you would and wouldn’t use your seatbelt when driving?”*

“Thanks for providing that explanation. You can think of the next set of questions I am going to ask as being very specific follow-ups to that explanation.”

Policy Issue 1—Need: *“Is there a threat or opportunity here that should compel me to make a decision about having some kind of rule about whether to use a seatbelt when I’m driving?”*

Policy QN1: *“Please take a moment to reconstruct in your mind when you first started thinking about the possibility of setting up a rule about when you would and wouldn’t use your seatbelt. Then let me know when you are ready to tell me about it. (Wait.)*

“So, as best you can, would you please tell me what happened that led you to consider setting up a seatbelt rule for yourself? For instance, did somebody say something? Did you read something? Was there some kind of significant event? Or what?”

Policy Issue 2—Mode: *“Who should I get involved in making this decision? Who is perhaps getting **themselves** involved in my making of this decision? What approach should I take in making this decision?: Figure it out from scratch? Follow some rule? Just do what I’ve always done or simply feel is right? What?”*

Policy QN2a (Mode-Who): *“Again, think back to when you were contemplating a rule to guide your seatbelt use. Were there any other people who got involved in your making that decision?”*

Yes: *“Who were those people, what roles did they play (one at a time [assuming more than one])—did they offer suggestions, serve as examples, make the decision for you, or what?”*

How, exactly, did each of these people come to be involved?”

No: Continue.

Policy QN2b (Mode-Tools): *“Did certain kinds of ‘tools’ get involved when you were making your decision to not set up a seatbelt rule for yourself, for instance, information sources, computer programs, decision aids?”*

Yes: *“What were those tools, and what roles did they play (one at a time [assuming more than one])—did they offer suggestions, provide examples, make the decision for you, or what?”*

How exactly did those tools come to be involved?”

No: Continue.

Policy QN2c (Mode-Primaries): *“When you were thinking about whether to set up a seatbelt rule for yourself, what approach or approaches did you take? Specifically: (a) Did you just try to figure out yourself, from scratch, whether it made sense to make a seatbelt rule to follow? (b) Did you follow some decision-making procedure? Or (c) did you just go with what felt right, perhaps based on things you have done in the past?”*

Policy Issue 3—Investment: *“What should I spend—in time, money, aggravation, peace of mind, or anything else—in figuring out whether to have a seatbelt rule for myself?”*

Policy QN3a (What/How Much): *“What did you ‘spend’ in the process of deciding not to have a seatbelt use rule for yourself? For instance, how much time, energy, peace of mind, or money did you spend doing research, talking to other people, or just thinking about what your rule ought to be?”*

Policy QN3b (How Concluded): *“As best you can recall, how did you conclude that that was the right amount of resources—time, money, energy, peace of mind, etc.—to spend on making your decision about adopting a seatbelt rule?”*

Policy Issue 4—Options: *“What are potentially ‘reasonable’ things that would make sense for me to consider seriously, in addition to adopting particular seatbelt use rules? How could I go about **finding** such potential rules?”*

Policy QN4a (Options): *“Think back to when you were figuring out whether to set up a rule for yourself about whether and when to use your seatbelt. What did you see as all your alternatives, including, for instance, different specific rules and any other specific things you might do instead of having a rule?”*

Policy QN4b (Identification/Generation): “As best you can remember, how did you come up with those alternatives? That is, where or how did you find or invent them?”

Policy Issue 5—Possibilities: “For any of the particular seatbelt use rules that I could adopt—or alternatives to such rules—what are the various things that could potentially happen as a result? What are good ways to make sure that I actually bring to mind the **important** possibilities?”

Policy QN5a (Recognized)—For each option acknowledged: “Earlier, you told me that you thought about (several) different alternative actions you might take, including _____. Let’s discuss them one at a time. I would like you to tell me this: When you were pondering each of those actions, what were the possible consequences that crossed your mind?”

Policy QN5b (How Surfaced): “As well as you can, would you please tell me how you went about trying to bring to mind those various potential consequences? In other words, what, if anything, did you do to try to make sure that you didn’t miss anything important—especially important things that are not immediately obvious?”

Policy Issue 6—Judgment: “It occurs to me that, if I were to adopt rule “X” (or not) one of the possible consequences would be “Y.” What are the chances that Y actually **would** happen if I were to (not) adopt that rule?” (Similarly for all the possible consequences of the remaining alternatives considered.)

Policy QN6: “In the last few minutes, you mentioned a number of things that you thought could happen as a consequence of your decision about whether to adopt a seatbelt use rule, such as _____. Right now, would you please try to bring to mind one of those consequences that figured especially prominently in your thinking and then tell me what it was? (Wait)

“So (summarizing), it was _____, right?” (Wait for confirmation.)

“Let’s focus a bit on _____ (the consequence mentioned), OK?
Specifically, tell me how likely you thought it was that _____ would happen if you decided to have a seatbelt rule for yourself as opposed to if you **didn’t** have a rule. So, at the time you were thinking about all this, did you think that _____ would have been more likely to happen (a) if you **had** a seatbelt rule or (b) if you **didn’t**? (Wait)

“Good. Now, please tell me **how much** more likely that would have been—either ‘Actually equally likely,’ ‘Only slightly more likely,’ ‘Moderately more likely,’ or ‘Much more likely?’ (Wait)

“As best you can explain it, how did you arrive at your judgment that _____ was actually equally likely (only slightly/moderately/much more likely) to happen if you had (didn’t have) a seatbelt rule than if you **didn’t (did)**? In other words, how did you come up with your conclusion?”

“What, if anything, did you do to try to verify the accuracy of your opinion?” (Wait)

“My last question in this section: Just a couple of minutes ago, you told me how you arrived at your judgment about the chances of _____ happening if you did or didn’t have a seatbelt use rule for yourself. What are the other kinds of ways that you sometimes arrive at judgments like these when you make decisions?” (Wait)

Policy Issue 7—Value: “I have envisioned a number of possible consequences of my seatbelt rule options. Those outcomes include the ones I originally sought to achieve or avoid as well as the others that occurred to me later. How much would I and anyone else involved really care about those outcomes if they actually came about?”

Policy QN7: “A while ago, you told me about a number of possible consequences of choosing or not choosing to set a rule for yourself about using your seatbelt when driving, including, for instance _____ (reading from subject’s possibilities list). Remember? (Wait) I would like to have us talk a bit about one of them. So would you please pick out one of those consequences that you thought was especially important if not **most** important?” (Wait)

“OK. So, let’s talk about _____.” (subject’s choice).

“First of all, suppose that _____ actually did happen. Including you, who are the people you thought would care whether or not that actually happened, that is would be either happy or unhappy about it?” (Wait and list)

“Now, let’s focus on **you**. At the time you were making your seatbelt rule decision, did you expect that, if _____ were to happen, that would make you happy or unhappy? (Wait)

“Please tell me **how** happy (unhappy) you expected that you would be if _____ were to happen—either ‘Actually indifferent,’ ‘A little,’ ‘Moderately,’ ‘Very,’ or ‘Extremely.’ (Wait)

“As well as you can, would you please tell me how you came to your expectation as to how happy (unhappy) you would have been if _____ were to happen? (Wait)

“What, if anything, did you do to verify the accuracy of your expectation?” (Wait)

“Now, let’s focus on one of the **other** people you just mentioned. Would you please pick one whose feelings would have been especially important to you when making your decision about setting up a seatbelt use rule?” (Wait) “The rest of the questions here will concern _____ (person selected).

“At the time you were making your seatbelt rule decision, did you expect that, if _____ were to happen, that would make _____ happy or unhappy?” (Wait)

*“Please tell me **how** happy (unhappy) you expected that _____ would be if _____ happened—either ‘Actually indifferent,’ ‘A little,’ ‘Moderately,’ ‘Very,’ or ‘Extremely.’ (Wait)*

“As well as you can, would you please tell me how you came to your expectation as to how happy (unhappy) _____ would have been if _____ were to happen? (Wait)

“What, if anything, did you do to verify the accuracy of your expectation?” (Wait)

Policy Issue 8—Tradeoffs: *“I am faced with whether to adopt some seatbelt-use rule and, if so, what particular rule. Each of these alternatives has both strong points and weak points relative to the other things I could do. Therefore, if I pick one, I gain **its** strengths but sacrifice the strengths of the **other** alternatives. So, in view of all this, which option should I pick?”*

Policy QN8: *“Again, a little while ago, you told me about several potential consequences of choosing or not choosing to set a rule for yourself about using your seatbelt when driving. In my next set of questions, I would like to revisit the things you mentioned.*

“First of all, let’s talk about which consequences you saw as either strengths or weaknesses for each alternative, one option at a time. Specifically, I have a little table here that I would like to have us fill out together, putting those consequences into the correct cells.” (Fill table, with subject.)

Table format (construct working table, shown to subject, on separate sheet):

Alternative	(Relative) Strengths	(Relative) Weaknesses
No Seatbelt Use Rule		
Some Kind of Rule		
Rule 1		
Rule 2		

“As we can easily see, each of the actions you could have taken concerning setting up a seatbelt use rule for yourself had different strengths and weaknesses relative to the other actions, right?” (Pause) So, if you pursued one action you would benefit from its relative strengths, but you would have to put up with its weaknesses, too, and therefore you had a dilemma on your hands. See what I mean? (Wait) So my question: As best you can, would you please explain to me how you resolved the dilemma as you saw it at the time you were actually making your decision? (Wait)

Policy Issue 9—Acceptability: *“I’m faced with deciding whether to set a seatbelt use rule for myself and, if so, what rule. Who would care if I choose to go one way or another, and about how I arrive at my choice? What, if anything, could and should I do about those people’s opinions?”*

Policy QN9: *“Think back to when you were trying to figure out what you should do in terms of setting up a seatbelt use rule that you might follow.*

*“Who were the people, if any, who you thought would care—one way or the other—what you decided, and perhaps **how** you reached your decision?” (Wait and list.)*

“Would you please pick out one of those people whose opinions you considered to be especially important from your point of view?” (Wait and note.)

“So, let’s talk about _____ (person chosen). At the time you were pondering your decision, why did you think that _____ would care about what you eventually chose to do?” (Wait.)

*“Irrespective of **what** you eventually chose to do, at the time, did you think that _____ cared about **how** you reached your decision? Please explain.” (Wait.)*

“As best you can recall, would you please tell me what, if anything, you did to deal with _____’s possible feelings? Put another way, how, if at all, did you take _____’s opinions into account when you made your decision? Also, would you please explain why you took that particular approach?”

Policy Issue 10—Implementation: *“I am considering whether to set a seatbelt use rule for myself, and if so, what that rule might be. Is it reasonable to anticipate that I would experience certain difficulties actually carrying out the action that I am contemplating? What might those difficulties be? What, if anything, could I do to deal with those difficulties? How, if at all, should these potential difficulties affect the decision I make?”*

Policy QN10: *“Think back to when you were trying to decide whether or not to adopt a seatbelt use rule and, if so, what such a rule might look like. When you were doing that, what potential difficulties, if any, did you envision experiencing when trying to put each the rule into effect, when actually **applying** that rule?” (Wait)*

*“How about possible difficulties in acting on a decision to **not** have a rule at all?
(Wait)*

“What, if anything, did you anticipate that you could do in order to deal with each of the difficulties you envisioned?” (Wait)

“How, if at all, did these anticipated difficulties affect how you went about making your final decision?” (Wait)

Go to **END**.

SERIES “YES”

The purpose of my next series of questions is to understand how you arrived at your decision to employ a rule to determine when you do or don't use your seatbelt while driving.”

Policy QY0: *“First, in your own words, would you please explain to me how and why you decided that you **would** establish a rule about when you would and wouldn't use your seatbelt when driving?”*

“Thanks for providing that explanation. You can think of the next set of questions I am going to ask as being very specific follow-ups to that explanation.”

Policy Issue 1—Need: *“Is there a threat or opportunity here that should compel me to make a decision about having some kind of rule about whether to use a seatbelt when I'm driving?”*

Policy QY1: *“Please take a moment to reconstruct in your mind when you first started thinking about the possibility of setting up a rule about when you would and wouldn't use your seatbelt. Then let me know when you are ready to tell me about it. (Wait.)*

“So, as best you can, would you please tell me what happened that led you to consider setting up a seatbelt rule for yourself? For instance, did somebody say something? Did you read something? Was there some kind of significant event, or what?”

Policy Issue 2—Mode: *“Who should I get involved in making this decision? Who is perhaps getting **themselves** involved in my making of this decision? What approach should I take in making this decision?: Figure it out from scratch? Follow some rule? Just do what I've always done or simply feel is right? What?”*

Policy QY2a (Mode-Who): *“Again, think back to when you were contemplating a rule to guide your seatbelt use. Were there any other people who got involved in your making that decision?”*

Yes: *“Who were those people, what roles did they play (one at a time [assuming more than one])—did they offer suggestions, serve as examples, make the decision for you, or what?”*

How, exactly, did each of these people come to be involved?”

No: Continue.

Policy QY2b (Mode-Tools): *“Did certain kinds of ‘tools’ get involved when you were making your decision to set up a seatbelt rule for yourself, for instance, information sources, computer programs, decision aids?”*

Yes: *“What were those tools, and what roles did they play (one at a time [assuming more than one])—did they offer suggestions, provide examples, make the decision for you, or what?”*

How, exactly, did each of these tools come to be involved?”

No: Continue.

Policy QY2c (Mode-Primaries): *“When you were thinking about whether to set up a seatbelt rule for yourself, what approach or approaches did you take? Specifically: (a) Did you just try to figure out yourself, from scratch, whether it made sense to make a seatbelt rule to follow? (b) Did you follow some decision-making procedure? Or (c) did you just go with what felt right, perhaps based on things you have done in the past?”*

Policy Issue 3—Investment: *“What should I spend—in time, money, aggravation, or anything else—in figuring out whether to have a seatbelt rule for myself?”*

Policy QY3a (What/How Much): *“What did you ‘spend’ in the process of deciding to have a seatbelt use rule for yourself? For instance, how much time, energy, peace of mind, or money did you spend doing research, talking to other people, or just thinking about what your rule ought to be?”*

Policy QY3b (How Concluded): *“As best you can recall, how did you conclude that that was the right amount of resources—time, money, energy, peace of mind, etc.—to spend on making your decision about adopting a seatbelt rule?”*

Policy Issue 4—Options: *“What are potentially ‘reasonable’ things that would make sense for me to consider seriously, in addition to adopting particular seatbelt use rules? How could I go about **finding** such potential rules?”*

Policy QY4a (Options): *“Think back to when you were figuring out whether to set up a rule for yourself about whether and when to use your seatbelt. What did you see as all your alternatives, including, for instance, different specific rules and any other specific things you might do instead of having a rule?”*

Policy QY4b (Identification/Generation): *“As best you can remember, how did you come up with those alternatives? That is, where or how did you find or invent them?”*

Policy Issue 5—Possibilities: *“For any of the particular seatbelt use rules that I could adopt—or alternatives to such rules—what are the various things that could potentially*

*happen as a result? What are good ways to make sure that I actually bring to mind the **important** possibilities?"*

Policy QY5a (Recognized)—For each option acknowledged: *“Earlier, you told me that you thought about (several) different alternative actions you might take, including _____. Let’s discuss them one at a time. I would like you to tell me this: When you were pondering each of those actions, what were the possible consequences that crossed your mind?”*

Policy QY5b (How Surfaced): *“As well as you can, would you please tell me how you went about trying to bring to mind those various potential consequences? In other words, what, if anything, did you do to try to make sure that you didn’t miss anything important—especially important things that are not immediately obvious?”*

Policy Issue 6—Judgment: *“It occurs to me that, if I were to adopt rule “X” (or not) one of the possible consequences would be “Y.” What are the chances that Y actually **would** happen if I were to (not) adopt that rule?” (Similarly for all the possible consequences of the remaining alternatives considered.)*

Policy QY6: *“In the last few minutes, you mentioned a number of things that you thought could happen that as a consequence of your decision about whether to adopt a seatbelt use rule, such as _____. Right now, would you please try to bring to mind one of those consequences that figured especially prominently in your thinking and then tell me what it was? (Wait)*

“So (summarizing), it was _____, right?” (Wait for confirmation.)

“Let’s focus a bit on _____ (the consequence mentioned), OK?”

*Specifically, tell me how likely you thought it was that _____ would happen if you decided to have a seatbelt rule for yourself as opposed to if you **didn’t** have a rule.*

So, at the time you were thinking about all this, did you think that _____ would have been more likely to happen (a) if you **had** a seatbelt rule or (b) if you **didn't**? (Wait)

“Good. Now, please tell me **how much** more likely that would have been—either ‘Actually equally likely,’ ‘Only slightly more likely,’ ‘Moderately more likely,’ or ‘Much more likely?’ (Wait)

“As best you can explain it, how did you arrive at your judgment that _____ was actually equally likely (only slightly/moderately/much more likely) to happen if you had (didn't have) a seatbelt rule than if you **didn't (did)**? In other words, how did you come up with your conclusion?”

“What, if anything, did you do to try to verify the accuracy of your opinion?” (Wait)

“My last question in this section: Just a couple of minutes ago, you told me how you arrived at your judgment about the chances of _____ happening if you did or didn't have a seatbelt use rule for yourself. What are the other kinds of ways that you sometimes arrive at judgments like these when you make decisions?” (Wait)

Policy Issue 7—Value: “I have envisioned a number of possible consequences of my seatbelt rule options. Those outcomes include the ones I originally sought to achieve or avoid as well as the others that occurred to me later. How much would I and anyone else involved really care about those outcomes if they actually came about?”

Policy QY7: “A while ago, you told me about a number of possible consequences of choosing or not choosing to set a rule for yourself about using your seatbelt when driving, including, for instance _____ (reading from subject's possibilities list). Remember? (Wait) I would like to have us talk a bit about one of them. So would you please pick out one of those consequences that you thought was especially important if not **most** important?” (Wait)

“OK. So, let’s talk about _____.” (subject’s choice).

“First of all, suppose that _____ actually did happen. Including you, who are the people you thought would care whether or not that actually happened, that is would be either happy or unhappy about it?” (Wait and list)

“Now, let’s focus on **you**. At the time you were making your seatbelt rule decision, did you expect that, if _____ were to happen, that would make you happy or unhappy? (Wait)

“Please tell me **how** happy (unhappy) you expected that you would be if _____ were to happen—either ‘Actually indifferent,’ ‘A little,’ ‘Moderately,’ ‘Very,’ or ‘Extremely.’ (Wait)

“As well as you can, would you please tell me how you came to your expectation as to how happy (unhappy) you would have been if _____ were to happen? (Wait)

“What, if anything, did you do to verify the accuracy of your expectation?” (Wait)

“Now, let’s focus on one of the **other** people you just mentioned. Would you please pick one whose feelings would have been especially important to you when making your decision about setting up a seatbelt use rule?” (Wait) “The rest of the questions here will concern _____ (person selected).

“At the time you were making your seatbelt rule decision, did you expect that, if _____ were to happen, that would make _____ happy or unhappy?” (Wait)

*“Please tell me **how** happy (unhappy) you expected that _____ would be if _____ happened—either ‘Actually indifferent,’ ‘A little,’ ‘Moderately,’ ‘Very,’ or ‘Extremely.’ (Wait)*

*“As well as you can, would you please tell me how you came to your expectation as to how happy (unhappy) _____ would have been if _____ were to happen?
(Wait)*

“What, if anything, did you do to verify the accuracy of your expectation?” (Wait)

Policy Issue 8—Tradeoffs: *“I am faced with whether to adopt some seatbelt-use rule and, if so, what particular rule. Each of these alternatives has both strong points and weak points relative to the other things I could do. Therefore, if I pick one, I gain **its** strengths but sacrifice the strengths of the **other** alternatives. So, in view of all this, which option should I pick?”*

Policy QY8: *“Again, a little while ago, you told me about several potential consequences of choosing or not choosing to set a rule for yourself about using your seatbelt when driving. In my next set of questions, I would like to revisit the things you mentioned.*

“First of all, let’s talk about which consequences you saw as either strengths or weaknesses for each alternative, one option at a time. Specifically, I have a little table here that I would like to have us fill out together, putting those consequences into the correct cells.” (Fill table, with subject.)

Table format (construct working table, shown to subject, on separate sheet):

Alternative	(Relative) Strengths	(Relative) Weaknesses
No Seatbelt Use Rule		
Some Kind of Rule		
Rule 1		
Rule 2		

“As we can easily see, each of the actions you could have taken concerning setting up a seatbelt use rule for yourself had different strengths and weaknesses relative to the other actions, right?” (Pause) So, if you pursued one action you would benefit from its relative strengths, but you would have to put up with its weaknesses, too, and therefore you had a dilemma on your hands. See what I mean? (Wait) So my question: As best you can, would you please explain to me how you resolved the dilemma as you saw it at the time you were actually making your decision? (Wait)

Policy Issue 9—Acceptability: *“I’m faced with deciding whether to set a seatbelt use rule for myself and, if so, what rule. Who would care if I choose to go one way or another, and about how I arrive at my choice? What, if anything, could and should I do about those people’s opinions?”*

Policy QY9: *“Think back to when you were trying to figure out what you should do in terms of setting up a seatbelt use rule that you might follow.*

*“Who were the people, if any, who you thought would care—one way or the other—what you decided, and perhaps **how** you reached your decision?” (Wait and list.)*

“Would you please pick out one of those people whose opinions you considered to be especially important from your point of view?” (Wait and note.)

“So, let’s talk about _____ (person chosen). At the time you were pondering your decision, why did you think that _____ would care about what you eventually chose to do?” (Wait.)

*“Irrespective of **what** you eventually chose to do, at the time, did you think that _____ cared about **how** you reached your decision? Please explain.” (Wait.)*

“As best you can recall, would you please tell me what, if anything, you did to deal with _____’s possible feelings? Put another way, how, if at all, did you take _____’s opinions into account when you made your decision? Also, would you please explain why you took that particular approach?”

Policy Issue 10—Implementation: *“I am considering whether to set a seatbelt use rule for myself, and if so, what that rule might be. Is it reasonable to anticipate that I would experience certain difficulties actually carrying out the action that I am contemplating? What might those difficulties be? What, if anything, could I do to deal with those difficulties? How, if at all, should these potential difficulties affect the decision I make?”*

Policy QY10: *“Think back to when you were trying to decide whether or not to adopt a seatbelt use rule and, if so, what such a rule might look like. When you were doing that, what potential difficulties, if any, did you envision experiencing when trying to put each the rule into effect, when actually **applying** that rule?”* (Wait)

*“How about possible difficulties in acting on a decision to **not** have a rule at all?”*
(Wait)

“What, if anything, did you anticipate that you could do in order to deal with each of the difficulties you envisioned?” (Wait)

“How, if at all, did these anticipated difficulties affect how you went about making your final decision?” (Wait)

Go to **END**.

END

“That was my last question. We’re done! Thank you so much for helping us out in our study.”

REFERENCES

REFERENCES

- Albert, D., & Steinberg, L. (2011). Judgment and decision making in adolescence. *Journal of Research on Adolescence, 21*(1). 211 -224.
- Baillie, L., Lovato, C. Y., Johnson, J. L., & Kalaw, C. (2005). Smoking decisions from a teen perspective: A narrative study. *American Journal of Health Behavior, 29*(2), 99-106.
- Brake, the Road Safety Charity. (2011). *Drivers blame everyone else for bad driving*. Retrieved April 29, 2011, from <http://www.brake.org.uk/blame>
- Calisir, F., & Lehto, M. R. (2002). Younger drivers' decision making and safety belt use. *Accident Analysis and Prevention, 34*(6), 793-805.
- Carson, D., & Bain, A. (2008). *Professional risk and working with people: Decision-making in health, social care and criminal justice*. London: Jessica Kingsley Publishers.
- Centers for Disease Control and Prevention (CDC). (2008). *Tobacco use and the health of young people*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved April 11, 2011, from http://www.cdc.gov/HealthyYouth/tobacco/pdf/tobacco_factsheet.pdf

Centers for Disease Control and Prevention (CDC). (2010). *Sexually transmitted diseases surveillance, 2009*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved April 11, 2011 from <http://www.cdc.gov/std/stats09/default.htm>

Centers for Disease Control and Prevention (CDC). (2011). *Youth and tobacco use*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved April 11, 2011, from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm

Chliaoutakis, J. I., Gnardellis, C., Drakou, I., Darviri, C., & Sboukis, V. (2000). Modelling the factors related to the seatbelt use by the young drivers of Athens. *Accident Analysis and Prevention*, 32(6), 815-825.

Culp, C.L. (2001). *The risk management process: Business strategy and tactics*. New York, NY: John Wiley & Sons, Inc.

Eby, D.W., Molnar, L.J., Kostyniuk, L.P., & Shope, J.T. (2005). Developing an effective and acceptable safety belt reminder system. In *Proceedings of the 19th Annual Enhanced Safety of Vehicles Conference*. (DOT-HS-809-825). Washington, DC: US Department of Transportation.

- Fell, J.C., Baker, T.K., McKnight, A.S., Brainard, K., Langston, E., Rider, R., Levy, D. & Grube, J. (2005). *Increasing teen safety belt use: A program and literature review*. (Report No. DOT-HS-809-899). Washington, DC: US Department of Transportation.
- Food and Drug Administration (FDA). (2011). *FDA 101: Smoking cessation products*. Silver Spring, MD: U.S. Department of Health and Human Services, Food and Drug Administration. Retrieved on April 29, 2011 from <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm198176.htm>
- Galvan, A., Hare, T., Voss, H., Glover, G., & Casey, B.J. (2007). Risk-taking and the adolescent brain: Who is at risk? *Developmental Science, 10*(2), F8-F14.
- Grunbaum, J.A., Kann, L., Kinchen, S.A., Williams, B., Ross, J.G., Lowry, R., & Kolbe, L. (2002). Youth risk behavior surveillance – United States, 2001. *Journal of School Health, 72*(8), 313-328.
- Hayes, E.R., & Plowfield, L.A. (2007). Smoking too young: Students' decisions about tobacco use. *The American Journal of Maternal-Child Nursing, 32*(2), 112-116.
- Hooper, C. J., Luciana, M., Conklin, H. M., & Yarger, R. S. (2004). Adolescents' performance on the Iowa Gambling Task: Implications for the development of decision making and ventromedial prefrontal cortex. *Developmental Psychology, 40*(6), 1148-1158.

- Hubbard, D.W. (2009). *The failure of risk management: Why it's broken and how to fix it*. Hoboken, NJ: John Wiley & Sons, Inc.
- Jans, M., Aremia, M., Killmer, B., Alattar, L., Molnar, L.J., & Eby, D.W. (under review). *Potential mechanisms underlying the decision to use a seat belt: A literature review*. Washington, DC: US Department of Transportation.
- Knapper, C. K., Cropley, A. J., & Moore, R. J. (1976). Attitudinal factors in the non-use of seat belts. *Accident Analysis and Prevention*, 8(4), 241-246.
- Martin, D. (2008). *Managing risk in extreme environments: Front-line business lessons for corporates and financial institutions*. London, UK; Philadelphia, PA: Kogan Page.
- Michels, T. M., Kropp, R. Y., Eyre, S. L., & Halpern-Felsher, B. L. (2005). Initiating sexual experiences: How do young adolescents make decisions regarding early sexual activity? *Journal of Research on Adolescence*, 15(4), 583-607.
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *JAMA: Journal of the American Medical Association*, 291(10), 1238-1245.
- Morrell, H. R., Song, A. V., & Halpern-Felsher, B. L. (2010). Predicting adolescent perceptions of the risks and benefits of cigarette smoking: A longitudinal investigation. *Health Psychology*, 29(6), 610-617.

- National Cancer Institute. (2010). *"Light" cigarettes and cancer risk* [Factsheet]. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health. Retrieved on April 19, 2011 from <http://www.cancer.gov/cancertopics/factsheet/Tobacco/light-cigarettes>
- National Highway Traffic Safety Administration (1996). *Third report to Congress: Effectiveness of occupant protection systems and their use*. Washington, DC: US Department of Transportation.
- National Highway Traffic Safety Administration (2010a). *Teen drivers*. Washington, DC: US Department of Transportation. Retrieved April 15, 2011, from <http://www.nhtsa.gov/Teen-Drivers>.
- National Highway Traffic Safety Administration (2010b). *Occupant restraint use in 2009: Results from the National Occupant Protection Use Survey Controlled Intersection Study* (DOT-HS-811-414). Washington, DC: US Department of Transportation. Retrieved April 19, 2011, from <http://www-nrd.nhtsa.dot.gov/Pubs/811414.pdf>
- Noll, R. G. (1985). *Regulatory policy and the social sciences*. Berkeley: University of California Press.
- Paradise, J. E., Cote, J., Minsky, S., Lourenco, A., & Howland, J. (2001). Personal values and sexual decision-making among virginal and sexual experienced urban adolescent girls. *Journal of Adolescent Health, 28*(5), 404-409.

- Patel, V. L., Yoskowitz, N. A., & Kaufman, D. R. (2007). Comprehension of sexual situations and its relationship to risky decisions by young adults. *AIDS Care, 19*(7), 916-922.
- Randolph, M.E., Pinkerton, S.D., Bogart, L.M., Cecil, H., & Abramson, P.R. (2007). Sexual pleasure and condom use. *Archives of Sexual Behavior, 36*(6): 844–848.
- Reyna, V. F., & Farley, F. (2006). Risk and rationality in adolescent decision making: Implications for theory, practice, and public policy. *Psychological Science in the Public Interest, 7*, 1-44.
- Ropeik, D., & Gray, G. (2002). *Risk: A practical guide for deciding what's really safe and what's dangerous in the world around you*. New York: Houghton Mifflin.
- Spear, L. P. (2000). The adolescent brain and age-related behavioral manifestations. *Neuroscience and Biobehavioral Reviews, 24*(4), 417-463.
- Sloan, F. A., & Smith, V. K. (2003). *The smoking puzzle: Information, risk perception, and choice*. Cambridge, Massachusetts: Harvard University Press.
- Viscusi, W.K. (1992). *Smoking: Making the risky decision*. New York: Oxford University Press.
- Wilson, T. D., & Gilbert, D. T. (2005). Affective forecasting: Knowing what to want. *Current Directions in Psychological Science, 14*, 131-134.

Yates, J.F. (1990). *Judgment and decision making*. Englewood Cliffs, NJ: Prentice Hall.

Yates, J.F. (2003). *Decision management*. San Francisco, CA: Jossey-Bass.

Yates, J.F. (2005). The mode issue – Part D2: Primary details (Extended). *Psychology* 449. Lecture conducted from University of Michigan, Ann Arbor.

Yates, J. F., & Alattar, L. (2009). Cultural issues. In M. W. Kattan (Ed.) & M. E. Cowen (Assoc. Ed.), *Encyclopedia of medical decision making* (pp. 247-252). Thousand Oaks, CA: SAGE Publications.

Yates, J.F., Alattar, L., LeBlanc, D., Eby, D.W., Molnar, L.J., Gilbert, M., Rasulis, M., & St. Louis, R. (under review). *An Analysis of Seatbelt Use Decision Making Among Part-Time Users* (Report No. UMTRI-2011-14). Ann Arbor, MI: University of Michigan Transportation Research Institute.

Yates, J.F., & Angott, A.M. (in press). Aiding judgment and decision making. In M.K. Dhimi, A. Schlottmann, & M. Waldmann (Eds.), *Judgment and decision making as a skill: Learning, development, and evolution*. New York: Cambridge University Press.

Yates, J.F., & Stone, E. R. (1992a). The risk construct. In J. F. Yates (Ed.), *Risk-taking behavior* (pp. 1-25). Chichester, England: Wiley.

Yates, J.F., & Stone, E. R. (1992b). Risk appraisal. In J. F. Yates (Ed.), *Risk-taking behavior* (pp. 49-85). Chichester, England: Wiley.

Yates, J.F., & Tschirhart, M. D. (2006). Decision-making expertise. In K. A. Ericsson, N. Charness, P. J. Feltovich & R. R. Hoffman (Eds.), *Cambridge handbook of expertise and expert performance* (pp. 421-438). New York, NY: Cambridge University Press.