

**Prospective Stories and Repairs:
Pitting Two Novel Approaches Against Compensatory Schemes for
Making, Justifying, and Influencing Multi-Attribute Decisions**

by

Lydia L. Chen

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Doctoral Committee:

Professor J. Frank Yates, Chair
Professor Robert Axelrod
Professor Oscar Ybarra
Associate Professor Priti R. Shah

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Abstract

This paper discusses two additional decision approaches beyond the traditional multi-attribute theory (the “matrix” approach where people weigh the pros and cons of a decision). The prospective story approach involves mentally simulating stories of what life would be like in the future should one take particular options. The prospective option repair approach involves planning specific and concrete actions one can personally take to ameliorate the downsides of particular options.

The two studies described in this paper tested the prevalence, self-persuasion, implementation, other-persuasion, and process costs and benefits of the matrix, repair, and story approaches by pitting the approaches against control (natural or unelaborated) approaches in a two-option decision task and eliciting responses from decision makers and audiences. We also tested for mediation of any effects by certain personal characteristics—subjective numeracy, narrative transportability, and actively open-minded thinking.

Self-reports by decider participants indicated that almost all of them spontaneously used some variant of decision matrices, most used some variant of prospective stories, and almost three-quarters used option repairs. Prospective narratives aided all the different persuasion aspects of decision processes—self-persuasion, justification, and influence—regardless of people’s narrative transportability, though at the cost of longer completion time and less enjoyment compared to other approaches. Prospective option repairs increased deciders’ implementation intentions, generation of new ideas (as self-reported by deciders), and perceived competence by audience participants. The traditional matrix approach, in contrast, aided only self-persuasion, but only for high subjective numeracy deciders. Decider participants tended to be one-sided in their option repairs/stories (they repaired or storied only their eventually-chosen

options) although two-sidedness (repairing or storying all options) was more persuasive to audience participants.

The studies validated prospective option repairs and stories as alternative descriptions for people's decision processes. The decision implementation and persuasion functions of these approaches help explain why many people use these approaches spontaneously, and suggest them as decision aids to would-be decision makers, advisors, and persuaders who do not. The time and effort needed to generate repairs and stories for all options are worthwhile for people concerned about persuasion and choice implementation.

Chapter 1

The Multi-Attribute Decision Problem, Questions, and Dissertation Overview

A long-standing area of interest in decision scholarship has been how people make choices involving multiple options, which differ in their attributes on various dimensions. Such choices are described as *multi-attribute* decision problems. In this dissertation, we limit ourselves to the “simple” case where all the attributes are known and guaranteed—that is, there is no “uncertainty.” For instance, a person might be trying to decide which of three cars to buy—Car A, Car B, and Car C—based upon the color, price, and gas mileage. There is no “uncertainty” if all three cars’ colors, prices, and gas mileages are fixed and readily obtainable by the decider, e.g., displayed on the ads for the cars. Car A is red, costs \$18,000, and gives 30 miles per gallon. Car C gives 29 mpg, costs \$22,000, and is gray. Car B costs \$20,000, is green, and gives 32mpg. Color, price, and mileage are the *dimensions* of the decision problem, while red, \$22,000, 30mpg, etc. are the specific *attributes*, or *features*, of the options at hand (Cars A, B, and C). Even with no uncertainty involved, such choices can be difficult when they require giving up pros that the person desires and/or accepting cons that the person dislikes.

The scientific aim of psychological research is to *understand* psychological processes, which involves “description” and “explanation.” *Description* involves understanding *what* people actually do, while *explanation* involves understanding *why* people do what they do. The practical aim of research involves *prescription*, or finding ways to improve psychological processes for people. Applied to multi-attribute decision making, then, we are concerned with describing how people actually make multi-attribute decisions, why they do it that way, and what can be done to improve that decision process.

Traditional multi-attribute theory assumes that people make decisions by weighing the pros and cons using numbers and rules. That is, it is as though they create mental tables (“matrices”) of option features and dimensions, quantify their valuations of those features and dimensions, and applying numerical rules to select winning options. But there are description, explanation, and prescription problems with the matrix approach, especially as illustrated by the spreading of alternatives phenomena, in which evaluations of various aspects of the decision matrix shift to favor the leading option throughout the decision process even without new information being added.

Inspired by observations of people’s decision processes in past research, this paper ties together decision, persuasion, narrative therapy, action planning, negotiation, business, and legal literature to propose two additional decision approaches largely unconsidered by past decision scholars. The prospective story approach involves mentally simulating stories of what life would be like in the future should one take particular options. The prospective option repair approach involves planning specific and concrete actions one can personally take to ameliorate the downsides of particular options. The two approaches provide alternative descriptions, explanations, and prescriptions to the traditionally studied matrix approach for people’s decision making and persuasion processes.

There are many reasons why the approaches should appeal to decision makers and persuaders, including their usefulness for spreading alternatives, resolving cardinal decision issues, decision self-persuasion, other-persuasion, and decision implementation. Verifying these benefits would provide potential explanations for why at least some decision makers use the approaches. Process costs and benefits of the approaches themselves, like process time, enjoyment, and perceived helpfulness, would also help explain why people do or do not use the approaches. Finding benefits of the approaches would also provide prescriptions for would-be decision makers, justifiers, and persuaders who have not thought of using these approaches before. The studies described in this paper tested the prevalence, self-persuasion, implementation, other-persuasion, and process costs and benefits of the matrix, repair, and story approaches. We subdivided the repair and story approaches into one-sided and two-sided variants, to see whether (a)

people tend to be one-sided or two-sided in their decision processes and (b) whether one-sidedness or two-sidedness is better as an other-persuasion strategy.

To achieve these aims, Studies 1 and 2 pitted several variants of the approaches of interest—matrix, one-sided repair, two-sided repair, and story—against control (natural or unelaborated) approaches, and compared their effects on decision makers and audiences. We also tested whether the effects of the matrix, story, and one-sided/two-sided approaches were mediated by certain personal characteristics— subjective numeracy, narrative transportability, and actively open-minded thinking, respectively. Study 1 elicited reactions from decision makers, while Study 2 elicited reactions from decision audiences. The studies randomly assigned participants to use (Study 1) or view (Study 2) one of the decision approach variants. The participants then completed questionnaires about the choices made, approaches used, and personal characteristics. The stories and repairs generated by participants in Study 1 were vetted and used to craft the stimuli for Study 2.

Self-reports by decider participants indicated that almost all of them spontaneously used some variant of decision matrices, most used some variant of prospective stories, and almost three-quarters used option repairs. Prospective narratives took the longest time to complete and were enjoyed the least. None of the treatment approaches were rated as being more helpful than using whatever approach one wanted to use, although the option repair approaches were rated as inspiring more fresh ideas. However, prospective narratives and option repairs did aid decision implementation and persuasion. Prospective narratives aided all the different persuasion aspects of decision processes—self-persuasion, justification, and influence—regardless of people’s narrative transportability. Prospective option repairs increased deciders’ implementation intentions and perceived competence by audience participants. Decision matrices, in contrast, aided only self-persuasion, and even then only for high subjective numeracy people. Ironically, decider participants tended to be one-sided even though it turned out that two-sidedness was more persuasive to audience participants.

These studies validated prospective option repairs and stories as viable competitors and complements to the traditionally studied decision matrices as descriptions, explanations, and prescriptions for multi-attribute decision processes. The decision implementation and persuasion functions contributed by those approaches help explain why many people use those approaches spontaneously, and recommend these approaches to those who do not. It may be worth the extra time and effort spent generating repairs and stories for all the options, even if only for other-persuasion purposes. Hence prospective option repairs and stories are worthy of further study and consideration for decision theorists', makers', and would-be persuaders' repertoires.

Chapter 2 reviews the traditional research on multi-attribute decision problems and how well it has addressed the description, explanation, and prescription questions. Chapter 3 defines and explains the two previously unexplored decision approaches—prospective option repairs and prospective narratives. Chapter 4 discusses the potential roles of the approaches in addressing the broad description, explanation, and prescription questions, and specifies four sets of specific empirical questions to test some of those roles. Chapters 5 and 7 describe and discuss the procedures, analyses, and results of Studies 1 and 2, respectively. Chapter 7 describes how the responses generated from Study 1 were filtered and vetted to create the stimuli for Study 2, and discusses observations we made on the stories written by participants. Chapter 8 wraps up the paper with a summary of all results, the descriptive, explanatory, and prescriptive implications of the results, and future directions, including an extension of the studies to long-term outcomes.

Chapter 2

Past Theories and Research

2.1 Traditional Multi-Attribute Decision Theory of the 60s and 70s

Traditionally, scholars have assumed that people solve multi-attribute decisions by mentally organizing the information in the equivalent of a table format, evaluating it, and then applying various decision rules to select one option among the ones in the table (Von Winterfeldt & Edwards, 1986). In this table form, called a *decision matrix*, rows represent the dimensions of interest to the decider, columns represent the options under consideration, and cells indicate the feature of the corresponding option on the corresponding dimension. Broadly speaking, traditional theory poses five steps for solving multi-attribute decision problems (Von Winterfeldt & Edwards, 1986). The first step is to organize the relevant information in a matrix form (see e.g., Table 2.1).

Table 2.1. A Decision Matrix of the Attributes of 3 Car Options on the Dimensions of Color, Price and Mileage

		Options		
		Car A	Car B	Car C
Dimensions	Color	Red	Green	Gray
	Price	\$18,000	\$20,000	\$22,000
	Mileage	30 mpg	32 mpg	29 mpg

Step 2 involves quantifying the “value” that each attribute has for the decider (called “attribute values”). In the car scenario, for instance, to what degree does the decider prefer the color red for a car? To what degree does she prefer green? Gray? Step 3 involves quantifying the relative importance of the dimensions to each other

(called “importance weights”). For instance, how important to the decider is the color of the car, relative to the price? Relative to the gas mileage? Steps 4 and 5 involve applying one or more decision rules to the above information until one option emerges as the one to be chosen.

In the past, decision theorists have taken Step 1—representing information in a decision matrix—as a given. The bulk of research in the 60s and 70s focused on Steps 2-4. Steps 2 and 3 have traditionally been viewed as issues of valuation “measurement.” The assumption is that values and weights are real and fixed entities in people’s minds that can be assessed. Methods that have been proposed for addressing the measurement issue include ratings, magnitude estimation, ranking, and point allocation (Belton & Stewart, 2002; Malczewski, 1999; Stevens, 1975; Von Winterfeldt & Edwards, 1986).

As for Steps 4 and 5, an obvious solution would be to pick the option that is at least as good as all of the other options on every dimension, and superior to all others on at least one dimension. This rule-of-thumb is known as the “dominance rule” (cf. Lee, 1971), as one chooses the option that “dominates” the other options. Unfortunately, it is often the case that no such “dominant” option exists among the set of options under consideration. This situation is referred to as *non-dominance*. For instance, Car A and Car B might be superior to Car C on all three dimensions; however, Car A is better than Car B in price, but worse in mileage. To give another example, Car A might have the best color, Car B might have the best price, but Car C might have the best mileage.

Decision theorists in the 60s and 70s established two broad categories of decision rules for resolving such non-dominance situations—non-compensatory and compensatory. *Non-compensatory rules* treat dimensions separately from one another. Thus, a car that is perfect on all dimensions but one might still be eliminated simply because of its deficiency in that one dimension. Non-compensatory schemes like the conjunctive and disjunctive rules (Coombs & Kao, 1955; Dawes, 1964a, 1964b) classify options as “acceptable” or “unacceptable” based upon whether they meet the minimum criteria for all or any, respectively, of the dimensions. In contrast, schemes like

elimination-by-aspects (Tversky, 1972) or lexicographic (axiomatized by Fishburn, 1974) dictate a certain order by which dimensions are used to eliminate options.

Compensatory rules, in contrast, require the decider to (a) combine his valuations of all the attributes for each option into a single number representing his overall valuation of that option (Step 4), and (b) choose the option with the highest overall valuation (Step 5). The most popular variant of Step 4 is the summation of the weighted values, called a “weighted additive value function.” Put another way, it is simply the dot product of the set of values and the set of weights across dimensions:

$$option\ appraisal = \sum_{d \in Dimensions} weight_d \times value_d$$

The weighted additive value function is the basis of Multi-Attribute Utility Theory (MAUT) (Edwards, 1971; Keeney & Raiffa, 1976), one of the more popular compensatory schemes. As an example, consider the sample decision matrix again, this time with a particular car buyer’s importance weights and values listed next to the corresponding dimensions and attributes (Table 2.2):

Table 2.2. The 3-Car Decision Matrix with Numerical Values, Weights, and Overall Appraisals

Dimension		Options					
		Car A		Car B		Car C	
	Importance Weights	Attributes	Values	Attributes	Values	Attributes	Values
Color	1	Red	+5	Green	+3	Gray	-2
Price	2	\$18,000	-1	\$20,000	-2	\$22,000	-5
Mileage	3	30 mpg	0	32 mpg	+1	29 mpg	0
Overall Option Appraisal		3		2		-12	

The numbers roughly indicate that he considers car color to be less important than price, which in turn is less important than gas mileage. Amongst the colors red, green, and

gray, he highly desires red, somewhat likes green, and mildly dislikes gray. Amongst the three prices, he dislikes \$18,000 slightly, \$20,000 a bit more, and \$22,000 extremely. Amongst the three mileages, he slightly likes 32 miles per gallon, but is indifferent to either 29 mpg or 30 mpg. Computing the dot product of the weights and values for each option yields overall option appraisal scores of 3, 2, and -12 for Cars A, B, and C, respectively. This car buyer should therefore choose Car A, as it has the highest value to him, based upon his valuations of the car's attributes and the three dimensions.

Such compensatory rules allow tradeoffs between dimensions. An option's strengths in certain dimensions can "compensate" for its weaknesses in other dimensions. For instance, a car that has the least desirable color may still be chosen if the gas mileage and price are good enough. Colloquially, this type of approach is what people mean when they speak of "weighing the pros and cons" to make a decision. For brevity's sake, we henceforth refer to this type of approach as the "matrix" approach.

2.2 Descriptive, Explanatory, and Prescriptive Value of Traditional Theory

How well has the previous research on non-compensatory and compensatory rules addressed the description, explanation, and prescription questions? Not sufficiently, we believe.

2.2.1 Description

Descriptively, traditional decision theories assume that something like the decision matrix *is* how people mentally represent their choices. Regarding the valuation measurement issue, they assume that attributes values and dimension importance weights can be measured, implying that they are fixed for a given individual. Regarding the non-dominance issue, they assume that people apply decision rules to the decision matrix in order to pick a winning option, the most popular of which include making tradeoffs.

These assumptions are problematic for multiple reasons. First, proposed methods for values and weights measurement and integration have limited applicability. Their use requires certain mathematical conditions to be met (Anderson, 1996, pp. 342-343). The

values and weights must be on linear scales. In certain methods, weights must be on ratio scales (have known zeros). In order to be integrated, people's values across dimensions must be of the same scale. Second, the evidence regarding which decision rules are more descriptive has been mixed. Different research communities have different ways of assessing the application of the rules (for a review, see Svenson, 1979). The different ways tend to give contradictory results (e.g., Billings & Marcus, 1983).

Finally, studies have shown that people often find numerical—and especially compensatory—schemes too complex and time-consuming. Information in real life is often not easily quantified, and many people are math-averse. People come up with alternative ways to compare the value of products just to avoid doing formal arithmetic (Lave, Murtaugh, & de la Roche, 1984). Non-compensatory schemes may be less thorough than compensatory ones, but they are preferred by people because they are easier to use (for a review, see Kottemann & Davis, 1991). Think aloud studies have shown that real-time decision making does not follow the systematic methods laid out by compensatory schemes (Klein, 2003). After reading descriptions of various decision making approaches, most of the graduate students studied by Means (1983) said that they would not use multi-attribute utility theory models in making real-life decisions due to their difficulty and time to use (Means, Salas, Crandall, & Jacobs, 1993).

2.2.2 Explanation

The “explanation” question has been addressed to a limited extent by traditional theorists. For the most part, they assume that people are rational decision makers, and simply use whatever decision rule is optimal in a given situation. Some have tried to resolve the discrepancies across studies testing the rules' descriptive validity by asserting that the decision rules used by people differ by personal traits, states, and situation (Payne, 1982; Payne, Bettman, & Johnson, 1993). These factors include education and emotions (Araña & León, 2009), cognitive load (Swait & Adamowicz, 2001), presentation of information, decision problem complexity, and similarity between options (Payne, 1982; Payne et al., 1993). A decision maker might choose to use a non-compensatory over a compensatory scheme if she is short on time and energy.

2.2.3 Prescription

If descriptively it is assumed that decision matrices are the mental representations of people's choices, then it follows that the prescription for improving decision making is to help people construct and improve their use of the decision matrix. So scholars have developed textbooks and computerized "decision aids" that prescribe how to construct such a matrix, how to properly locate each option along the dimensions, and how to appraise the attributes, assign importance weights, and integrate them (e.g., Belton & Stewart, 2002; Figueira, Greco, & Ehrgott, 2005; Keeney & Raiffa, 1976). Methods like ratings, rankings, and point allocation are not just descriptions of how people assign values and weights, but prescriptions for how they should assign values and weights. Hence schemes like MAUT are both descriptive and prescriptive.

There has been insufficient coverage of the prescription issue regarding both decision rule use and valuation measurement. Theoretical reasons have been proposed for why using formal decision schemes should be optimal (e.g., Keeney & Raiffa, 1976), but conducting empirical studies to verify that is difficult for logistic reasons (see J. Frank Yates, 1990). Even if such schemes are optimal for the "rational decision maker," they may still be tossed aside by decision makers outside the lab due to their complexity and time consumption (Kottemann & Davis, 1991). Nor do they increase self-reported satisfaction with the generated solution (Narasimhan & Vickery, 1988).

Decision scholars have also insufficiently addressed the prescription issue with respect to measuring values and weights. There are two measurement-related issues—the choice of measurement method and labile values. First, as discussed previously, there are many ways to measure individual values and weights, and each has its advantages and disadvantages (e.g., N. H. Anderson, 1996; Malczewski, 1999). Unfortunately, different measurement methods (e.g., ratings versus magnitude estimation) can yield drastically different results (N. H. Anderson, 1996). Yet decision aid texts merely point out the flaws of each method and ultimately leave the final choices up to the user (e.g., Belton & Stewart, 2002; Figueira et al., 2005; Von Winterfeldt & Edwards, 1986).

Second, even if values and weights can be “measured” accurately, the valuations are not consistent across time and situations. The decision aids mentioned above implicitly assume that there are “ground truths” in people’s valuations and weights—that they are fixed and merely need to be “measured.” This assumption harkens back to measurement theory, which tries to measure these valuations via the same methods used for physical entities. However, studies on “constructed preferences” in the late 1980s and early 1990s (e.g., Chapman & Johnson, 1995; Tversky, Sattath, & Slovic, 1988; Tversky, Slovic, & Kahneman, 1990) showed that valuations are subjective and often generated on the fly. They are “labile” and shifting (Fischhoff, Slovic, & Lichtenstein, 1979; Slovic, 1995). For instance, a person may prefer sad music when he is in a sad mood, but happy music when he is in a happy one. In other words, sometimes there is no single “ground truth” to be discovered. These issues with measurements call into question just how useful the valuations obtained at any one time for a person really are.

2.3 The Spreading of Alternatives Phenomenon and More Recent Theories

The descriptive, explanation, and prescriptive validity of the multi-attribute decision rules and methods studied in the 60s and 70s are already questionable given the instability of attribute values and dimension importance weights across situations and time. Even more problematic for those theories, it has been found that values and weights can shift not just randomly, but in systematic and predictable ways. They can shift to support whichever option the decider happens to be leaning toward at a given time. This systematic shift toward a favored option was what sparked our research into how people make difficult decisions.

2.3.1 The spreading of alternatives phenomena

“Biased predecision processing” (coined by Brownstein, 2003) refers to any phenomena in which decision makers alter parts of their mental decision matrix to favor a particular option before making their choice. Possible alterations include:

1. “spreading of alternatives”—shifts in overall appraisals of the options themselves such that the difference in overall appraisal between the favored option and other options is increased (e.g., Festinger, 1957; Mann, Janis, & Chaplin, 1969)
2. “distortion of information”—shifts in appraisals of the extent to which attributes favor the options (Carlson & Russo, 2001; Russo, Carlson, & Meloy, 2006; Russo, Medvec, & Meloy, 1996; Russo, Meloy, & Medvec, 1998; Russo, Meloy, & Wilks, 2000)
3. “distortion of probability”—shifts in people’s judgments of the attributes’ likelihoods of happening (DeKay, Patino-Echeverri, & Fischbeck, 2009; DeKay, Stone, & Miller, 2010)
4. and “coherence shifts” (coined by D. Simon, Pham, Le, & Holyoak, 2001)—shifts in appraisals of those attributes (values) and the dimension importance weights (D. Simon, Krawczyk, Bleicher, & Holyoak, 2008; D. Simon, Krawczyk, & Holyoak, 2004; D. Simon et al., 2001).

Take our three-car scenario as an example. Suppose that a decider originally specified the values, weights, and overall option appraisals displayed in Table 2.2. The dimensions that are in Car A’s favor are color and price. Since Car A has the highest overall appraisal, it becomes his favored option, also called the *leading option* or the *leader*. If spreading of alternatives occurs, the overall option appraisals would shift so that Car A’s appraisals are monotonically higher than before, while the appraisals of Cars B and C’s are lower than before—e.g., 5, 0, and -14. In other words, the difference in appraisal between the leader and the other options would increase, or “spread” over time.

If coherence shifts occur, the values for Car A would monotonically increase—e.g., to +6, +1, and +1—while those for Cars B and C might decrease—e.g., to +2, -4, -1, and -3, -7, and -1, respectively. The importance weights for those dimensions that favor Car A—color and price—might monotonically increase, e.g., to 3 and 2, while the weight for the dimension that disfavors it—mileage—might decrease, e.g., to 1.

If distortion of information occurs, the decider’s combined ratings of how strongly each attribute favors Car A over the other two cars would increase over time.

Suppose the first piece of information the decider received at the beginning of the decision process happened to be the price of Car B. When asked how strongly that price favors one car over another, the decider might say +1 on a scale of +4 (Strongly favors Car A) to -4 (Strongly favors Car B). By the end of the decision process, however, new pieces of information the decider receives would be given stronger ratings in favor of Car A. For instance, when presented with Car A's price and asked how strongly it favors one car over another, the decider might say +4.

Finally, if distortion of probability occurs, the very attributes themselves might be altered in the mind of the decider so that they favor Car A. Taking the mileage dimension, for example, the decider might conveniently misremember Car A as having 32 mpg mileage and Car B as having 30 mpg instead of the other way around. If distortion of probability occurs, the decider's judged likelihoods of attributes that favor Car A would increase, while those for attributes that disfavor Car A would decrease. For instance, regarding the mileage, he might argue to himself that "those mileage numbers are only estimates anyway; there may be errors in the way they are measured" or "I don't carry much in my car; I'm likely to get better mileage than what's advertised."

The spreading of alternatives and related phenomena are often framed as "consistency seeking." This is because people are changing their mental representations of decision problems (cognitions) to be consistent with whichever option they favor or choose (behavioral tendency).

2.3.2 Explanations of spreading of alternatives

The Russo et al., and DeKay camps, which studied distortion of information and distortion of probability, respectively, offered little in terms of explanations for the phenomena they study. As for the Simon et al. camp, they did find that predecisional coherence shifting only lasts about 15 minutes, suggesting that shifting serves mainly to build confidence in the favored alternative (2008). Simon et al. (2008) also explain coherence shift as part of the human brain's natural tendency to make cognitions consistent (in this case, to make one's values and importance weights consistent with one's anticipated choice). They believe that consistency-seeking is hardwired into the

brain via its neural network (D. Simon et al., 2008), but have not conducted behavioral studies regarding this.

The search for dominance structure (SDS) theory (Montgomery & Svenson, 1976; Montgomery, et al., 1983; Montgomery & Willen, 1999) and the differentiation and consolidation (DiffCon) theory (Svenson, 1992, 2003; Svenson & Hill, 1997) were both “understanding”-oriented theories. They sought to describe and explain the spreading of alternatives phenomenon, by positing specific stages, mechanisms, and drivers of decision processing. They both viewed the phenomenon not only as normal, but as a fundamental part of the decision process. Both theories imply that rather than being a fast-and-frugal method for decision making, biased predecision processing is an effortful process that takes time and energy. SDS theory asserts that a decision process’s primary purpose is to determine an option that dominates over all others (dominance rule). DiffCon, in contrast, asserts that the primary purpose is to (a) sufficiently differentiate options from one another predecision, and then (b) consolidate them and bolster the chosen option postdecision. These are fundamental decision “needs” that are driven by people’s compulsion to be consistent, as well as to minimize the amount of energy wasted on continual decision reversals and consequent changes in implementation plans (Svenson, 2003). There are two drivers of consistency-seeking. One is the brain’s automatic and natural tendency to find “gestalt” and be coherent, as Simon et al. say. The other is to reduce cognitive dissonance and its resulting negative emotional arousal (see e.g., Cooper & Fazio, 1984; Harmon-Jones, 2000).

Chapter 3

Definitions and Illustrations of the Prospective Repairs and Narratives Decision Approaches

As discussed in the previous section, traditional theories on decision matrices are still lacking in their description, explanation, and prescription of multi-attribute decision making, especially given the spreading of alternatives and related phenomena. Unlooked-for observations made in our previous study suggested two alternative approaches to multi-attribute decisions—prospective narratives and option repairs. In this chapter, we define and illustrate these approaches.

In a previous study (Chen & Yates, in progress), we attempted to address the Explanation question of why decision makers shift their attribute and dimension valuations to cohere with their favored options by positing that coherence aids self-persuasion, decision implementation, and other-persuasion. To test this, we asked participants to choose between two job offers and justify their choices via video to other participants.

While studying those justification videos, we observed that some participants made use of what we call prospective mental simulation and repairs. Specifically, the wording of some participants' explanations suggested that they had mentally simulated what their future lives would be like with the options. For instance, one described the noisiness and unfriendly atmosphere that would result from working in a cubicle with coworkers who always stay in their cubicles for lunch. Some participants even went a step further. They brought up the downsides of their chosen options, and proposed concrete actions that they would take to minimize those downsides once they implemented those options. For instance, one explained that the noisiness of the cubicle

would not bother her, because she would wear earphones and listen to her iPod at work, thus blocking out the noise. Henceforth, we refer to such tactics as *option repair*.

3.1 The Prospective Repairs Approach to Decision Making

We define *option repairs* as concrete and specific personal actions a decision maker can take to deal with, improve upon, or otherwise minimize the negative consequences of an option's downsides. For example, suppose that Tom wants to buy a house. He really prefers House A to House B, but House A is much older than House B and Tom is afraid that it has many hidden physical flaws. He can "repair" House A and erase its downside relative to House B by planning to order and pay for an inspection of it before buying it.

We view repairs as a form of prospective problem solving that involves prospective mental simulation. This is because people are mentally simulating the future, anticipating problems that might arise with options, and planning actions they can take to solve those problems. In a way, participants who make such "repairs" to an option essentially erase from their decision mental representation those pesky downsides of that option. They, in a sense, alter the very decision problem they were originally given, by creating options that are even better than the options they were originally given. The creation of new options is one way in which the option repair approach differs from the matrix tradeoff approach. Emphasis is moved from making tradeoffs between existing options, to construct new and better options.

Another departure from traditional decision theory is that the option repair approach recommends that one be concerned not so much about which option is currently the dominant one, but about which option can be most easily improved to become the dominant one. Instead of comparing options as they currently are, people would compare options as they will be *after* fixing them up. Instead of holding out for an option that is already dominant—an ideal that may never appear—the repair approach would suggest picking the option that is most easily fixable to *become* dominant. As an example, suppose a person is looking to buy a house and values location and eco-friendliness equally. Everything else being equal (including price), it would be better to pick a house with low eco-friendliness than one in a bad neighborhood. This is because a house's eco-

friendliness can be improved with some work, whereas its location cannot. Even if the difference in eco-friendliness between the two houses is more important to the person than the difference in location, those values and dimension weights no longer matter once those differences between the options have been erased.

The idea of anticipatory problem solving has been touched on to a small extent by stress coping, business, and negotiation literatures. Proactive coping is about anticipating future stressors and coming up with ways to deal with them. This can involve mental simulation and planning actions (C. A. Anderson, 1983; Aspinwall & Taylor, 1997), which in turn aids problem solving (Taylor & Schneider, 1989). The coping literature does not relate anticipatory problem solving to decision processes, however.

SWOT analysis in business management has been the only literature that actually recommends anticipatory problem solving mainly for the purpose of addressing decision problems. It involves identifying the internal strengths and weaknesses of an organization as well as external opportunities and threats with respect to achieving a specified objective (Bracker, 1980). One of the recommended steps involves thinking of actions to take to address weaknesses and threats.

Negotiation experts recommend thinking of actions that one or more parties can take to improve upon existing options both before and during negotiations (e.g., R. Fisher & Ury, 1981; Susskind & Cruikshank, 1987; Thompson, 2001). They discuss finding ways to “expand the pie” being negotiated over. In fact, the phrase “problem solving” has been used to describe this integrative style of negotiation (as opposed to “compromise” or “competition” styles). However, the motivations behind option improvement are not so much to facilitate decisions involving non-dominance, but to either (a) maximize one’s outcome, regardless of the option chosen or (b) entice other parties toward the option one wants them to take (e.g., other-oriented decision influence). Suppose that Tom, our prospective house buyer, has as his BATNA (Best Alternative To a Negotiated Agreement) his current apartment, which he can always stay in if he does not buy a house. One of the reasons that House A is attractive is that it has air conditioning, which his apartment does not. He can “repair” his BATNA by planning to

buy an air conditioner if he ends up staying with it. That would put him in a better bargaining position with House A's seller.

In fact, one can even *request* an option repair from another party. Recall that Tom was planning to "repair" House A as an option by having it inspected before he buys it. Instead of taking action himself, he can instead ask the seller to order and pay for the inspection. On the flip side, the party on the other side of the table can try to influence Tom's choice by initiating the option repair. For instance, the House A seller can ask Tom what it is that makes Tom hesitate about buying it. Upon learning of Tom's concern about its physical flaws, the seller would offer to pay for the inspection and thus allay Tom's concern.

3.2 The Prospective Narratives Approach to Decision Making

Problem solving, mental simulation, and coherence are all elements of narratives (Mar, 2004; Mar & Oatley, 2008; Pennington & Hastie, 1993; Rideout, 2008; E. Smith & Hancox, 2001). Knowing the persuasive (Appel & Richter, 2007; Escalas, Moore, & Britton, 2004; Green, Strange, & Brock, 2002; Prentice & Gerrig, 1999) and emotional health-improving (King, 2001; McAdams, 2001; Pennebaker, 2000; Pennebaker & Seagal, 1999) properties of narratives as well as people's tendency to generate narratives about themselves (Clark & Mishler, 1992; Mishler, Clark, Ingelinger, & Simon, 1989; Riessman, 1993), we surmise that prospective narratives can be yet another approach for decision making, one that often incorporates option repairs and complements decision matrices.

Mental simulation has been defined as a "cognitive construction of hypothetical scenarios or imitative mental representation of some event or series of events" (Taylor & Schneider, 1989). Stories that are played in the mind can thus be viewed as forms of mental simulation (Mar & Oatley, 2008). Specific definitions of stories vary widely both within and across disciplines (see e.g., Kaplan, 1986; Klein, 1999; Mar, 2004; Schank & Berman, 2002). Putting all the definitions together, however, we can broadly define *stories* or *narratives* as sequences of interrelated events, dialogues, goals, actions, and personal reactions centered on a protagonist, with supporting characters. They

incorporate causality, emotions, imagery, predictions of events, problem solving. They usually have some sort of moral, theme, or lesson built in, the basis of which is whether the protagonist ends up happy or unhappy in the end. Figure 3.1 summarizes the concepts of mental simulations, stories, and repairs and the relationships among them.

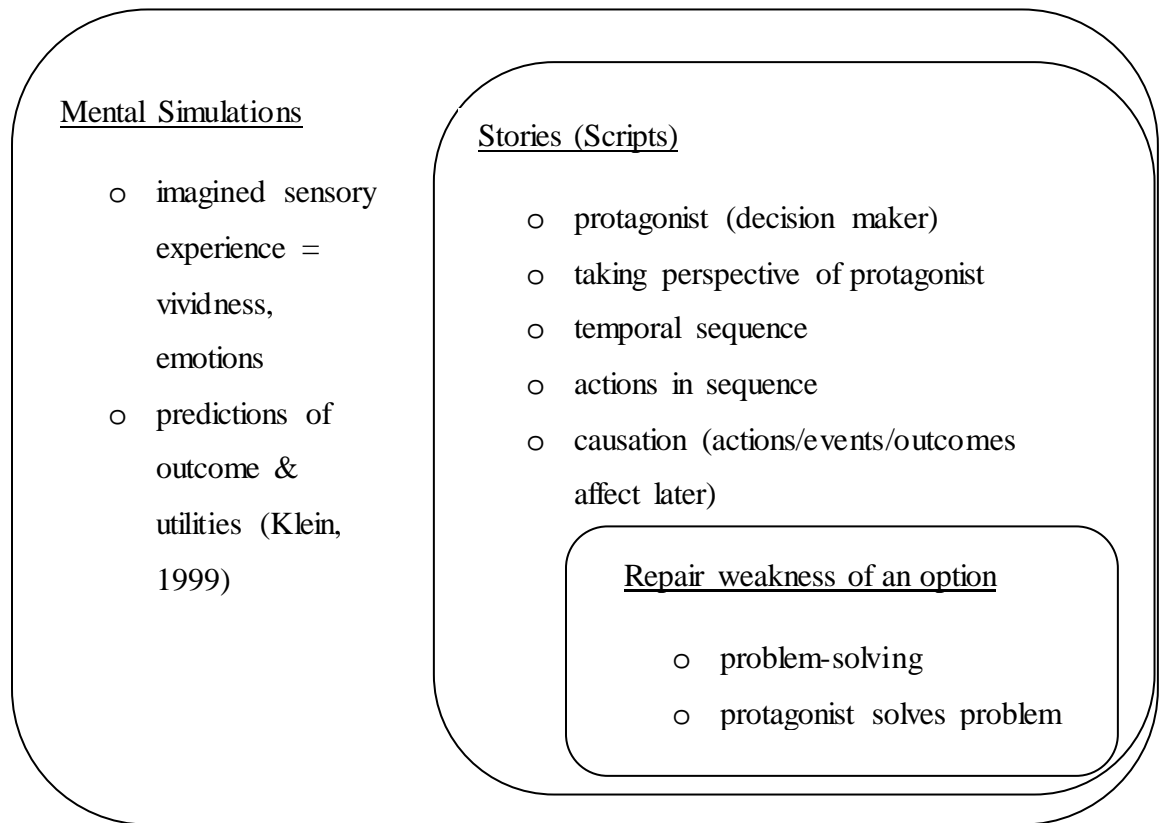


Figure 3.1. Distinguishing among simulations vs. stories vs. repair

The prospective narratives approach we posit for decision making would work as follows. The decision maker takes an option and creates a mental simulation of what her future life would be like with that option. She populates the story with people in her life and potential people she might meet later in life. She simulates their and her own interactions and reactions to events and to one another. She envisions actions she and they might take as a result of the option. She might engage in problem solving (option repair) if she foresees any problems and interpersonal conflicts that come up and plans how to resolve them. In a decision situation, the “lesson” of the story would be a summation of the features and whether the option makes the decider ultimately happy or

unhappy. The decider generates such stories for all the options. She chooses the option in which she, the protagonist, has the happiest ending or life. The decider, in essence, plays the triple role of author (the creator of the story), protagonist (the central character of the story), *and* audience (the evaluator of the stories).

Take the car scenario as an example. The decider creates a story of his future life should he purchase Car A. He imagines cruising down the road in a car with a color he is proud of (mental imagery, action). He imagines boasting to his family and friends of the great bargain he received for the car, and their impressed reactions (interpersonal interactions and dialogues). He feels the pleasure and pride he would have for the car (emotions). He might also simulate the downsides of Car A. The low price could indicate inferior quality (inference); he sees himself standing on a highway shoulder next to the car that has broken down due to the inferior quality (causality). He pictures a cop pulling him over (interpersonal conflict), who assumes he is reckless and risk-seeking because of the car's color (causality) and gives him a ticket (action).

The decider might also make “option repairs” by planning what he could do to avoid or ameliorate the problems caused by the downsides of Car A. He could plan to purchase roadside assistance with some of the money he would save on the car price. He could plan to have the car repainted to avoid looking too reckless. Finally, the decider weighs the entire story and determines how happy his life would end up with Car A. The story might have a theme or moral such as “Fun Ride for a Great Bargain” (happy ending) or “Cheap Junk Not Worth the Trouble” (unhappy ending). Once he has done this for all three cars, he chooses the car with the happiest projected future life.

Notice that the problem solving involved in stories and option repairs addresses a different kind of problem than the reasoning problems typically studied by cognitive psychologists. The former kind consists of negative events and other consequences that result from implementing decisions, whereas the latter kind involves cognitive and physical puzzles, games, and other challenges.

In the following section, we discuss the possible functions of the option repair and story approaches—namely, their descriptive, explanatory, and prescriptive significance.

See Appendix A for definitions, elaboration, and discussions of “self-persuasion,” “other-persuasion,” and “implementation.”

Chapter 4

Empirical Questions and Significance

This section discusses the potential descriptive, explanatory, and prescriptive value of the prospective repairs and narrative approaches, as well as corresponding empirical questions we sought to test.

4.1 Description and Question Set 1 (Q1)—Prevalence

Recall the broad description question: How do people make multi-attribute decisions in non-dominance situations? As discussed in the beginning of Chapter 3, in an earlier study on coherence and multi-attribute decisions (Chen & Yates, in progress), we observed that some participants justified their decisions by simulating their future lives or mentioning repairs they would make to their choice's downsides. We therefore posit that prospective narratives and option repairs are approaches that some people use to make multi-attribute decisions with non-dominance. Pertinent empirical questions include ones like these: How often do people tend to adopt these approaches of their own accord? What forms do these approaches assume when people use them? Under what conditions do people use these approaches?

As discussed in section 2.2.1, the matrix approach traditionally touted by decision scholars does not fully address the question of how people make multi-attribute decisions. Among other things, people often find it too complicated and time-consuming to use. In contrast, despite being largely ignored by experimental psychologists, decision making using prospective narratives has often been observed in real-world domains, including medicine (Greenhalgh, 1999), intelligence analysis (Clauser, 2008, p. 170), transnational security (e.g., the 2011 DARPA workshop titled “*Stories, neuroscience and experimental technologies (STORyNET): Analysis and decomposition of narratives in*

security contexts, 2011”), politics (e.g., L. D. Smith, 1989), and law. (There have been judges on policy-affecting cases who mentioned in their opinions that they rejected certain options because they had envisioned the negative consequences for future generations arising from those options.) Moreover, we know that people tend to spontaneously generate stories for making judgments about the past (e.g., Krieger, 1981; Pennington, 1981; Pennington & Hastie, 1988, 1993). In fact, people appear to have a tendency to create stories about virtually anything, especially themselves (McAdams, 2001). In the clinical setting, patients tend to describe their circumstances in the form of stories (Riessman, 1993, pp. 56-57), and become upset when they are not allowed to by clinicians (Clark & Mishler, 1992; Mishler et al., 1989). Studies have found that people will ascribe intentionality even to mere basic shapes that are moving (for a review, see Mar & Macrae, 2006).

There has been even less mention and testing of prospective option repairs as an approach that decision makers spontaneously use. The only mention came from the SDS (Montgomery & Willen, 1999) and DiffCon (Svenson, 1992, 2003; Svenson & Hill, 1997) theorists. Both camps have broached the idea of minimizing the downsides of an option by repairing it (called “de-emphasizing” by the former camp and “problem restructuring” by the latter). Svenson and Hill (1997, p. 219) even suggested that “[in problem restructuring] the set of given decision alternatives is not accepted as such [*sic*] but new options created in the situation.” This idea was inspired by the problem solving literature on functional fixedness and insight (Svenson, 2010). But the specifics of making repairs was not elaborated upon, and empirical testing has yet to be done (Svenson, 2010).

Therefore, one important descriptive question we asked dealt with the prevalence of the approaches:

Q1:Prevalence—What is the prevalence of the use of decision matrices, prospective option repairing, and prospective storying among decision makers?

Q1a: Do people spontaneously use decision matrices, prospective narratives and/or option repairs when making multi-attribute decisions? What percentage of them do so?

In our earlier study (Chen & Yates, in progress), we only observed the use of mental simulation and repairs by some of the participants. Thus it is plausible that prospective narratives and repairs are only two of a variety of approaches that people can choose to use for decision making. We hypothesize that different individuals may find different approaches more useful for them than others. For instance, people who are apt with and enjoy numbers may be more likely to use the decision matrix approach. People who like telling or writing stories or tend to become absorbed in narratives may be more likely to use the stories approach. People who have a lot of real-life experience, practical intelligence, fluid intelligence, or problem solving skills may be more likely to do option repair.

Q1b: Is the use of prospective narratives, repairs, and matrices mediated by certain personal characteristics of the deciders?

We also noticed that people who justified their decisions using repairs only mentioned them for their chosen option. It could be that they deliberately neglected mentioning repairs for the rejected option because that would weaken their decision justifications to themselves or others. On the other hand, they may really only have bothered to repair their favored options during their decision processes. Some psychological theorists (e.g., Klein, 1996; Koehler, 1991) talk about how people consider options sequentially in order of how appealing they are, and end their decision processes as soon as they find a sufficiently satisfactory one. This ending of decision processes as soon as a “good enough” option is found is called “satisficing” (H. A. Simon, 1982). Verifying such confirmatory hypothesis testing in our studies has theoretical significance because it would provide support for the notion that people employ narratives and repairs only for the purpose of persuading themselves to commit to an option, as opposed to trying to improve their decision outcomes. So a description sub-question is:

Q1c: If people do use prospective repairs or stories, do they generate them for all options, or only for the option they eventually choose? Is this mediated by certain personal characteristics?

Suppose we find that some people do use the approaches, while other people do not. Explanatory-wise, we would want to know why people who spontaneously use the approaches do so. Prescription-wise, we would want to know whether the approaches have benefits that make them worth recommending to decision makers, justifiers, and persuaders.

4.2 Explanation

Recall the broad explanation question: Why do people make multi-attribute decisions in the ways that they do? What explains the use of prospective repairs or narratives by some people as found by Chen and Yates (in progress)? This section reviews a variety of decision concerns that are important to people. We believe that prospective repairs and stories help to address these concerns, and thus providing at least a partial explanation of why people use these approaches for decision making. Concerns that we believe prospective option repairs and stories address. First, repairs address people's biggest concern about decision making—i.e., bad outcomes, and can help them spread alternatives. Second, prospective repairs and narratives help resolve some of the cardinal decision issues proposed by Yates (2003). Third, they aid decision self- and other-oriented persuasion.

4.2.1 Minimizing bad outcomes and spreading alternatives via repairs

A past study that asked participants to describe what they considered to be “good” versus “bad” decisions (J. F. Yates, Veinott, & Patalano, 2003) showed that people's biggest fear about decision making is the obtainment of poor outcomes. Option repair as an approach should be attractive to people because it can be used to improve their decision outcomes. Suppose Mary plans some actions she can take to improve one or more of her options at hand. She then picks an option from the “improved” pool of options. If she picks an option that has been “repaired” and does end up implementing

the repairs, her outcome would be better, or at least no worse, than if she hadn't made the mental repairs.

Why not simply pick the best option first, then take action to improve it after implementing the choice? In mathematical terms, option repair and option selection using the dominance rule are not commutative functions: Assuming that planned actions do end up being implemented, it would be better to repair options, then pick one, as opposed to pick an option, then repair it. This is true when—to give a two-option example—Option A is superior to Option B before any improvements, but inferior to Option B after improvements. Repairing options first before picking one would induce a person to choose improved-Option A, while picking an option before repairing it would induce him to choose improved Option B, which is worse than improved Option A.

$$\begin{cases} \text{select}(\text{repair}(A), \text{repair}(B)) = \text{repair}(A) \\ \text{repair}(\text{select}(A, B)) = \text{repair}(B) \end{cases}$$

$$\text{repair}(A) > \text{repair}(B)$$

$$\Rightarrow \text{select}(\text{repair}(A), \text{repair}(B)) > \text{repair}(\text{select}(A, B))$$

One-sided option repair (that is, repairing only one's favored option or chosen option) also allows people to spread alternatives. Making "repairs" to one's favored option seemed to us a clever way to "have one's cake and eat it, too"—at least, in the mind of the decider. First, the repair tactic allows decision makers to maintain consistency between their values, and the features of the options they choose. Repairs alter the chosen option's features as construed by deciders from what they do not like into whatever they do like. Second, a decider can avoid emotional costs (see Botti & Hsee, 2010) associated with being forced to make tradeoffs. Instead of accepting the downsides of an option, decision makers can simply remove them. Instead of giving up the upsides of a rejected option, decision makers can try to "repair" the chosen option so as to give it those very upsides.

Third, by creating removing the downsides of options and turning them into dominating options, prospective repairs resolve non-dominance situations, thereby

serving as alternative mechanisms by which spreading of alternatives can be achieved. Theoretically, it is possible to repair all options such that they are equally dominant. That would be no problem, as theoretically one can then just flip a random coin in order to pick an option. Past scholars discussing the spreading of alternatives and related phenomena (for a review, see Brownstein, 2003) for the most part assumed that what is happening is the changing merely of attitudes toward fixed option features and weights. The way that spreading of alternatives and related phenomena have been described in the past, for the most part, made them sound irrational or maladaptive—note the use of adjectives with negative connotations even in many of the phrases used to refer to the phenomena—i.e., “*distortion* of information [emphasis added],” “*distortion* of probability [emphasis added],” “*biased* predecision processing [emphasis added].”

In contrast, our prospective repairs theory suggests that some people actually alter their construal of the very features themselves, in ways that improve those features in their minds. The resultant options in their minds end up being actually *better* than the ones originally posed by the decision problems. They in essence apply the old maxim: “If you don’t like something the way it is, change (fix) it”—or at least they plan to. It could be that people are merely trying to spread alternatives for the reasons given by Svenson (e.g., Svenson, 2003), and plan actions that they never implement. But suppose people really do end up making at least some of the repairs they propose for the chosen option. In that case, an increase in their evaluation of the repaired option would be logical, as the altered option inside their minds is actually better than the original option. A caveat is that this repairs explanation only works for explaining increases in the favored option’s evaluation, not for explaining decreases in the disfavored options’.

4.2.2 Resolution of cardinal decision issues

We argue that prospective mental simulation, option repairs, and narratives help decision makers resolve seven of the ten cardinal decision issues as delineated by Yates (2003)—options, possibilities and judgments, values, tradeoffs, acceptability, and implementation. “Possibilities” refer to the various consequences that can occur due to taking the decision options. “Judgments” refer to the likelihood of those consequences

happening. “Acceptability” is essentially other-oriented justification; it refers to getting other people to agree to the decision.

The ways in which the traditionally studied decision approaches, along with mental simulation, repairs, and narratives, affect the seven cardinal decision issues are charted in Table 4.1.

Table 4.1. Several Decision Tools and the Cardinal Decision Issues They Likely Affect in Deciders’ Minds

	Decision Tools			
	Traditional schemes	Mental Simulation	Repairs (Problem Solving)	Narratives (beyond what mental simulation and repair already provide)
Options			*By improving upon existing options	
Possibilities & Judgment		Plausible based on Anderson & Godfrey (1987)		Some evidence. Think-aloud protocols (Olson, 1983). Sanfey and Hastie (1998)
Value	Via measurement methods. Needs testing	Evidence from Shiv & Huber, 2000)		*Via affect (Oatley, 2002; for a review, see Crano & Prislin, 2006).
Tradeoffs	Via compensatory rules. Needs testing		*Removes need to make tradeoffs in the first place.	
Implementation	**	*Via action planning	**Via action planning	**Evidence from Krishnamurthy & Sujana (1999)
Acceptability (Other-Oriented Justification)	Proposed by Gardiner & Edwards (1975). **Needs testing	*Via imagery (Escalas, 2004). *Needs testing.	**Needs testing	**Narrative persuasion theories.

* Proposed by us, but as yet untested. ** Tested in our studies.

Traditional non-compensatory and compensatory decision schemes focus only on the “values,” “tradeoffs,” and “acceptability” issues. As described in section 2.1 above, Steps 2 and 3 of the traditional schemes address the values issue via “measurement” methods. Compensatory rules originated to help decision makers deal with the tradeoffs issue, as laid out in Step 4. Gardiner and Edwards (1975) also proposed that laying out the entire decision problem in a matrix format helps communicate the decision to other people. As discussed in section 2.2, however, there has been little empirical evidence to support the use of the traditional decision approaches for helping with the three issues. To the best of our knowledge, no empirical studies have been conducted to test the usefulness of compensatory schemes for the tradeoffs and acceptability issues either.

4.2.2.1 Prospective mental simulation and the cardinal decision issues

Mental simulation of options and their features touch on the possibilities, judgments, values, implementation, and acceptability issues. Mental simulation affects people’s predictions about the future (see Svenson, 2003; Taylor & Schneider, 1989). Though this has yet to be tested, it is plausible that mental simulation leads decision makers to think of possibilities they would not have otherwise considered. However, we suspect that depth may be emphasized at the expense of breadth. That is, mentally simulating a particular scenario leads a person to think of Possibility A, which then makes him think of Possibility B which would result from A, which in turn leads him to think of Possibility C which would result from B. But he invests so much effort in Possibility A and its resultant possibilities that he neglects to consider alternative possibilities to Possibility A. In tree/graph language, mental simulation encourages people to explore far along a particular branch, but at the expense of exploring sister branches. Studies showing this tendency to fixate on one scenario at the expense of alternative scenarios after envisioning it was discussed by Koehler (1991).

Taylor and Schneider (1989) contended that mental simulation influences people’s judged likelihood of events. Anderson & Godfrey’s (1987) study provided evidence for the “simulation heuristic” (Kahneman & Tversky, 1982) whereby people judged the likelihood of an event based upon how easy it is to picture that event mentally. Mental simulation is used by decision makers to address the values issue. Shiv and

Huber (2000) found that, when asked to predict the future utilities of options for them, people engage in mental simulation. Numerous studies (C. A. Anderson, 1983; Taylor & Pham, 1996; Ten Eyck, Labansat, Gresky, Dansereau, & Lord, 2006; for a review, see Osburn & Mumford, 2006) have implicated mental simulation as a contributor to action planning and implementation. Finally, imagery has been shown to be persuasive to people (Escalas, 2004), so mental simulation should aid decision acceptability.

4.2.2.2 Prospective option repairs and the cardinal decision issues

Problem solving via option repairs helps address the options, tradeoffs, implementation, and acceptability issues. By taking existing options and “repairing” their downsides, repairs introduce new, improved “options” to the consideration set. Repairs improve upon a decision matrix. Instead of merely accepting the features and downsides of options as they are, people recognize that those can be altered. This makes sense, explanation-wise and prescriptively, as in real life people do find ways to deal with problems after they commit to an option. People who plan the actions before making the decision are basically anticipating this reality.

As was discussed earlier, if they are able to remove the downsides of their chosen options, people can avoid making painful tradeoffs that require accepting some undesirable features while sacrificing some desirable ones. In essence, option repairs convert a multi-attribute decision problem’s focus from a tradeoffs cardinal decision issue to an options one. Making tradeoffs have high emotional costs (Botti & Hsee, 2010), so it makes sense that people would want to avoid doing so if possible.

Because repairs involve planning specific actions people can personally take to deal with negative consequences of their decisions, repairs should help with implementation as well. Making specific plans has been shown to improve action implementation (for a review, see Gollwitzer, 1999). Finally, although the idea has not yet been tested, showing that one has already considered and found ways to resolve potential problems with the chosen option should aid other-oriented persuasion as well. One reason this should work is that it shows that one was competent and thoughtful during the decision process. It also shows off one’s reasoning and problem solving skills.

In addition, an audience should feel reassured, knowing that there *are* ways to deal with potential problems with the choice.

4.2.2.3 Prospective narratives and the cardinal decision issues

Narratives contribute to the resolution of many of the cardinal decision issues beyond what mental simulation and repairs already do. Regarding the possibilities cardinal issue, think-aloud protocols (Olson, 1983) have shown that stories invoke prediction-making on the part of readers, in contrast to retrospection when reading other kinds of writing. Stories also affect judgments, for better or for worse. Sanfey and Hastie's (1998) subjects relied more upon presented information and made more accurate judgments of marathon runners' completion times when that information was presented in the form of short stories, as opposed to tables of numbers or bar graphs. Stories appeared to help people remember the information better. In addition, narratives evoke emotions in the reader (Oatley, 2002; for a review, see Crano & Prislin, 2006), and emotions affect judgment, albeit not always in a positive way (Denesraj & Epstein, 1994; Rottenstreich & Hsee, 2001; Sunstein, 2003).

By incorporating emotions, prospective narratives should also affect the values cardinal issue. Since the protagonists of the created stories are the deciders themselves, the protagonists' emotional reactions to the story events can be used to predict the decider's emotional reactions to those events in reality. We theorize that creating prospective narratives during decision making serves to strengthen implementation intentions as well. There is evidence that ads that induce prospective thinking about the self increase product purchase intentions (Krishnamurthy & Sujjan, 1999).

Finally, narratives that are created during decision making should be useful for communicating and persuading others about a choice. People tend to think of narratives as entertainment, not persuasion devices (Green & Brock, 2000). This tendency reduces psychological reactance against traditional forms of persuasion. Numerous non-psychologists in the past have touted the communicative and persuasive virtues of stories, including scholars in law (e.g., Bennett & Feldman, 1981; Spence, 2005), social movement (Strange, 2002), screenwriting (McKee, 1998), business (Maxwell &

Dickman, 2007; Simmons, 2006), policy (Kaplan, 1986), even science (Czarniawska-Joerges, 2004; W. R. Fisher, 1994; Krieger, 1981). At last, psychologists have become involved since the last decade, leading to the fairly new “narrative persuasion” field (see e.g., Appel & Richter, 2007; Escalas, Moore, & Britton, 2004; Green, Strange, & Brock, 2002; Prentice & Gerrig, 1999).

A key point apparent from Table 4.1 is that the decision schemes advocated by traditional theory only address three cardinal decision issues—values, tradeoffs, and possibly acceptability—whereas mental simulation, problem solving, and narratives address not only those issues, but four additional ones as well—options, possibilities, judgment, and implementation. The usefulness of the approaches in addressing cardinal decision issues could serve as explanations for why people use such approaches when making decisions. Besides the seven cardinal issues discussed, we theorize that the various decision tools can be used to address self-persuasion as well. The factors that make the tools compelling for other-persuasion purposes should make them work for self-persuasion purposes, too. With respect to the narratives approach, for example, narrative therapy literature suggests that self-narratives are helpful—some say even necessary—for good mental health (King, 2001; Pennebaker, 2000; Pennebaker & Seagal, 1999).

Clearly, many of the decision making benefits of prospective option repairs and stories we proposed in the passages above still require empirical verification. The studies described in this dissertation focused in particular on testing the self-persuasion, implementation intention, and other-persuasion effects of the decision approaches of interest. In Chen and Yates (in progress), we posited that people seek coherence in their decisions because it helps them persuade themselves to commit to and implement those decisions, as well as persuade others to respect them and their decisions. We found that private coherence did predict self-persuasion, implementation, and anticipated other-persuasion, and that self-persuasion completely mediated the effects on the other two dependent variables. For the current work, we propose that prospective mental simulation, option repairs, and narratives have those same effects for decision makers. Verifying this would provide possible explanations for why at least some people use

these approaches spontaneously. Successful decision self-persuasion, implementation, and other-persuasion provide important functions for people (see Appendix A); so people may very well be driven by those considerations in their decision processes.

4.2.3 Question Set 2 (Q2)—Self-Persuasion and Implementation Effects

Q2: Self-Persuasion and Implementation Effects—Would making decisions on the basis of matrices, repairs, or narratives serve self-persuasion or decision implementation purposes?

Q2a: Which form(s) of presenting decision explanations are (more) effective for increasing self-persuasion, implementation intention, and anticipated other-persuasion—matrices, prospective repairs, or prospective narratives?

Once again, we were interested in finding out whether particular personal characteristics have mediating effects or not. For instance, affinity for numbers may affect the impact of using the matrix approach on self-persuasion, implementation intention, and/or anticipated other-persuasion, while affinity for story-writing may affect the impact of the narratives approach.

Q2b: Is the impact of the approaches on decision self-persuasion, implementation intention, and anticipated other-persuasion mediated by certain personal characteristics of the deciders?

A caveat about repairs and stories is that they may not be realistic. Regardless of how persuasive people find they are or how willing they are to take actions to turn them into reality they could do more harm than good in the long run if they do not actually occur. A person may fantasize about having the car repainted to a desired color, but she could be doing it just to persuade herself to commit to the decision. Once she obtains the car, she may very well not bother to repaint it, as that would still take a lot of effort and money to do. As for stories, Tom the house-buyer may picture all the wonderful people he will meet at the neighborhood parties he will throw once he has bought and moved into the house with the good location, but many of those wonders—the people and parties—may very well end up not coming to fruition.

Q2c: Are the repairs that people come up with unrealistic for them to execute?

Finally, we were interested in whether repairing particular options makes them more likely to be picked by deciders, suggesting that repairs do carry the benefit of enhancing options in the eyes of decision makers.

Q2d: Do people who are instructed to repair only one option end up choosing that option more than those who are instructed to repair all or none of the options? Is this mediated by certain personal characteristics?

4.2.4 Question Set 3 (Q3)—Process Costs and Benefits

We were also interested in the investment cardinal issue. As Yates (2003) discussed, the potential costs and side benefits of decision processes matter when trying to explain or prescribe them. Studying or prescribing a certain decision approach is pointless if people do not and are reluctant to use it. A decision maker would be more reluctant to use a decision process if it has high costs or is unenjoyable, e.g., takes up a lot of time and effort. This has been an issue for the matrix approach traditionally prescribed by decision scholars, according to past studies, e.g., Mean, 1983; Means et al., 1993).

A decision maker should be more eager to use a decision process if it has ancillary benefits—like being fun to use or appearing to be helpful. It is plausible that, once instructed to use the approaches, decision makers would find them useful and appealing for the reasons outlined in the Explanation section 4.2.1. Even if an approach does not actually produce better outcomes than the matrix approach, it is still useful to know whether people *think* it does, because then they might actually use it in their everyday lives. For the above reasons, it is important to compare approaches on their time consumption, enjoyability, and perceived usefulness to people. Even an approach takes a lot of time to complete, people may be willing to adopt it nonetheless if they perceive it as enjoyable or useful.

Q3:Process Cost and Benefits—What are the relative process cost and appeal of matrix, repair, and story approaches' to decision makers?

Q3a: Does use of the prospective narratives and repairs approaches take longer time than the matrix or spontaneous approaches?

Q3b: Do people who are instructed to use the prospective narratives and repairs approaches end up believing them to be as or more useful or enjoyable than those who are instructed to use the matrix or spontaneous approaches?

Once again, personal characteristics plausibly have mediating effects. For instance, people who like numbers should find the matrix approach more useful and helpful than those who do not, while those who like writing stories should find the narratives approach more enjoyable and helpful than those who do not. People who are good at problem solving would find option repairs more enjoyable and helpful than those who do not.

Q3c: Is the enjoyment and perceived helpfulness of approaches mediated by certain personal characteristics of the deciders?

There was a caveat we wished to test regarding repairs and stories in particular.. It was unclear whether repairing/storying both options (a two-sided repair/story approach), repairing/storying only the chosen option (a one-sided repair/story approach), or both would be considered useful by people. On the one hand, people may prefer to exert effort on and strengthen only their favored option in order to spread alternatives. On the other hand, being thorough by strengthening and exerting effort on all of the options before choosing between them may enable people to feel more confident about their decisions. They would know that they have done all they could do to explore and strengthen all the options before choosing between them. If it is the case that two-sided approaches provide the same amount of benefit as one-sided approaches, then there is no point in wasting the extra time repairing/storying all options when merely repairing/storying the chosen option would do.

Q3d: Do people find prospective narratives and repairs more useful when they apply the approaches to all options, or just the one they eventually choose? Is this mediated by certain personal characteristics?

4.2.5 Question Set 4 (Q4)—Other-Persuasion Effects

Finally, we were interested testing in whether communicating decisions by discussing decision matrices, prospective repairs, or prospective narratives do in fact aid decision other-persuasion. As was already discussed in section 4.2.2 above, there are many reasons why repairs and narratives should be compelling to decision audiences. Justifying one's decisions, managing other people's impressions of oneself as a decision maker, and influencing other people's decisions carry useful benefits (Appendix A.1). Explanation-wise, finding other-persuasion benefits would help explain the use of the decision approaches by people. Prescription-wise, it would motivate our recommendation of them to people who do not already use the approaches. Even if people do not find such approaches useful for their own decision making, they may prefer to think through them anyway, if only to help themselves persuade other people about their choices. Employing specific and concrete procedures for decisions can help one organize one's thoughts and justify them to other people. We therefore wished to know the effects of decision matrices, prospective repairs, and prospective stories, if any, on audiences to decisions.

Personal characteristics—this time among decision audience members—may once again mediate any differences between approaches. For instance, people who like numbers may find decision persuasion on the basis of decision matrices more convincing than those who do not.

Q4:Other-Persuasion Effects—Would justifying decisions on the basis of matrices, repairs, or narratives serve other-persuasion purposes?

Q4a: Which form(s) of presenting decision explanations are (more) effective for other-oriented justification and influence purposes—matrices, prospective repairs, or prospective narratives?

Q4b: Are differences in effectiveness for the approaches mediated by certain personal characteristics of the audience members?

We are also interested in whether two-sided other-persuasion strategies work better than one-sided strategies or vice versa. *One-sided* communication strategies

(Hovland, Lumsdaine, & Sheffield, 1949) involve bringing up evidence and arguments only for one's own position—that is, focusing on only one side of an issue. *Two-sided* strategies, in contrast, involve discussing both sides of an issue—that is, bringing up evidence and arguments both for and against one's own position in hopes of preemptively addressing them. Proponents of one-sided strategies assert that bringing up weaknesses of one's own position merely empowers and emphasizes those weaknesses to the audience (Lawson, 1970). Proponents of two-sided strategies, in contrast, assert that bringing up weaknesses oneself (a) enhances one's source credibility and (b) inoculates the audience against and minimizes the impact of that evidence and those arguments. The latter function is especially important for audience members who are likely to be aware of or exposed to the counterevidence, e.g., by the opposition (for reviews of such research, see Crowley & Hoyer, 1994; Lloyd-Bostock, 1988).

The one-sided/two-sided persuasion concept would apply to decision persuasion as follows: someone who wants to be one-sided when justifying or influencing decisions would discuss only the strengths of his preferred options and the weaknesses of his disliked options. In contrast, someone who wants to be two-sided would discuss, in addition to those, the weaknesses of his preferred options and the strengths of the disliked ones. People may be driven to be one-sided or two-sided in their decision processes in anticipation that later on they will need to justify their choices or influence those of other people.

Compensatory decision schemes such as the matrix tradeoff one are clearly two-sided approaches; they force the user to consider all dimensions and option features by assigning numbers to them and computing aggregate scores. Story approaches, in contrast, may be either one-sided or two-sided. For instance, one could be deliberately one-sided by presenting only happy stories for the chosen option and unhappy stories for the rejected option, or two-sided by presenting happy stories for both options, then explaining why the happy story is more likely to occur for the chosen option and not the rejected option. Another variation involves the features discussed in the stories, as opposed to the happiness/unhappiness of the stories' endings. One could be deliberately one-sided by only discussing features and dimensions favorable to the chosen option,

while leaving out those favorable to the rejected option (versus two-sided by giving full coverage of all relevant features and dimensions.) We leave other variations to the reader's imagination. It is unclear whether one-sided or two-sided story strategies are more effective on decision audiences. Audience members may be so transported by option stories that they forget to consider whatever the decider leaves out of the stories, as narrative persuasion scholars would say. Or perhaps high actively open-minded thinking individuals will notice neglect and penalize deciders for it.

The same question exists for the option repair approach. Repairs are ways to strengthen one option over the other. A one-sided decision justification strategy would involve mentioning repairs for only one option, whereas a two-sided one would involve mentioning repairs for both options. On the one hand, a one-sided repair strategy increases the difference between the options' attractiveness, whereas a two-sided strategy may increase, decrease, or not affect the difference at all. Audience members may have a hard time generating repairs themselves. They may thus not notice that the persuasion strategy is one-sided, or if they do, they may assume that repairs for the rejected option are not feasible for the decider. On the other hand, an audience may be more impressed by someone who has made the effort to be more thorough and unbiased in their decision making.

Q4c: Is it better to be one-sided or two-sided when repairing/storying options for other-oriented justification and influence purposes? Is this mediated by certain personal characteristics?

4.3 Prescription

Recall the broad prescription question: What recommendations can we make for people to improve their multi-attribute decision making? In the previous section, we gave reasons for why prospective option repair and narratives should appeal to decision makers. They are potential explanations for why at least some people use those approaches. Our research also has prescriptive significance. As discussed in the Description section 4.1, heretofore no scholars have tested the descriptiveness of the prospective narratives and repairs approaches. It could very well be that only a minority

of decision makers use those approaches. However, the same benefits of repairing and storying should also make those approaches appeal to people who do not already use the approaches spontaneously. In fact, the rareness of the approaches in people's natural decision repertoires would make it all the more important for the approaches to be promoted by decision scholars. After all, if the approaches are shown to be enjoyable and useful, yet rarely used, then here would be an enormous opportunity to improve decision makers, justifiers, and would-be persuaders' repertoires.

Improving advice-giving to other people (a form of decision influence) is another practical benefit of this research. Many professions—e.g., health care practitioner, lawyer, consultant, Cabinet member--require one to advise other people on their decisions. Being able to construct and describe advisees' likely future lives with their options is as essential as knowing the pros and cons of the options. Suppose Henry has just been told that he has inoperable cancer and must decide whether he wants to try chemotherapy or not. It would seem natural for him to want to know not just the pros and cons of taking or not taking chemotherapy, but what his life would be like, both under therapy and not. A criminal defendant trying to decide whether to plead guilty or not would want his lawyer to describe what will likely happen in either scenario. As for repairs, decision makers should welcome suggestions for what steps they will be able to take to reduce the downsides of their options. For instance, planning to be a model prisoner in order to achieve early parole can help convince a defendant to take a guilty plea in lieu of jumping bail. As for option repair, advice for "managing" the downsides of options, such as "managing" the pain from taking chemotherapy, should be much appreciated by advisees.

Although ideas similar to repairs have appeared in past coping, SWOT analysis, and negotiation literature (see section 3.1 above), only the SWOT literature has prescribed repairs for making and justifying decisions. The negotiation literature has recommended repairs for influencing other parties' likelihood of committing to one's desired courses of action. As for prospective narratives, they have yet to be explicitly suggested as prescriptions for decision making or justification. They have been

suggested prescriptions for decision influence in the past by marketing researchers (Adaval & Wyer, 1998; West, Huber, & Min, 2004).

4.4 Combining the Approaches

To sum up, there are implementation, persuasion, and other advantages to prospective narratives, mental simulation, and repair that may make them more useful and appealing to decision makers than the traditional decision matrix approach. We should point out that we view the former approaches as *complementary* approaches to the matrix approach, not direct competitors.

Indeed, it could very well be that *combining* the approaches would be more useful for persuasion and other purposes than using any one of them singly. For instance, a decider might construct a decision matrix, take the downsides of each option and make repairs to them, make tradeoffs between the options, construct stories simulating and predicting their future lives with those options, use those stories to think of new downsides and repairs to make, re-evaluate the options, and so on. Indeed, there is empirical evidence that using both narrative and statistical evidence in a message is more persuasive than using either type of evidence alone (Allen et al., 2000).

We propose that personal characteristics could explain this finding. First, personal characteristics that mediate the use of narratives, repairs, and matrices are not necessarily mutually exclusive. So there may be individuals who find more than one of the approaches appealing. There are likely to be personal characteristics among audience members as well. Combining the approaches when justifying one's decision to other people is like "hedging one's bet." Different approaches would appeal to different members of the audience.

4.5 More about Theoretical and Practical Significance—Old Hat versus New

In the previous sections, we discussed how this research addresses some of the gaps in the multi-attribute decision making literature--namely, that prospective narratives,

mental simulation, and repairs could be decision approaches that complement the traditionally studied matrix approach in addressing key description, explanation, and prescription questions. Repairs, in particular, allow for the creation of new options—something that traditional theory does not cover. Prospective repairs also provide an alternative, partial explanation for the spreading of alternatives phenomenon. Instead of merely shifting their attitudes toward option features, as past researchers assumed, decision makers may actually be planning improvements to option features, thus changing them and improving evaluations of them. In addition, past researchers have not tested personal characteristics to see if they predict which approaches are more influential for which individuals. Personal characteristics may explain why past researchers have obtained mixed evidence (see Allen et al., 2000 for a review) as to whether numerical or narrative information is more persuasive to people.

There are three major gaps in other areas of social and cognitive psychology that this research would affect by introducing prospective option repairs and stories (see Table 4.2).

Table 4.2. Proposed New Areas of Study in Psychology

Row	Literature	Area Studied by Previous Scholars	Proposed New Area of Study
1	Multi-attribute decision making and justification	Matrix approach	Stories and "repair" approaches. Creation of new options (via repairs)
			Personal characteristics
2	Explaining spreading of alternatives effect	Shifting evaluation of features—Change attitudes toward features	Repairing unfavorable features—Change features themselves
3	Narratives for decision making	Retrospective stories	Prospective stories
4	Narrative persuasion for decision making	Other-oriented influence	Self-persuasion and other-oriented justification “Repair”/problem solving’s effect on impression management
5	Narrative persuasion in general	Coherence, causality, concreteness, imagery, vividness, emotionality, transportation, empathy, identification with hero, audience relevance	“Repair” (problem solving/conflict resolution aspect)

The third area this research touched on was the intersection between narratives and decision making. We distinguish between “retrospective” (based on past experience) and “prospective” (based on projections of future events) narratives and repairs, as inspired by past researchers’ distinction between “retrospective” and “prospective” mental simulations (Sanna, 1996; Sanna, Small, & Cook, 2004). An example of a retrospective story about a decision option would be “my cousin got rear-ended at night once, because his car was hard to see.” In contrast, a prospective story might be “If I get this dark green car, I predict that I will on some night get rear-ended, because dark cars are hard to see at night.” This simulation of the future and the consequences of choices are exactly what leaders mean when they talk about having a “vision” for their organization. Past scholars have remarked on retrospective stories as mechanisms for decision making and giving advice (Krieger, 1981). For instance, studies using mock jurors have shown that laypeople make legal decisions by constructing stories in their minds of how the crimes in question came to occur (Pennington, 1981; Pennington & Hastie, 1988, 1993). Lawyers are exhorted to win cases by (a) constructing stories of how the crimes in question occurred so as to favor their party, then (b) convincing their audiences that their stories are more accurate representations of the facts than their opponents’ (e.g., Spence, 2005). As was mentioned in section 4.1, however, the use of *prospective* stories has neither been suggested nor tested by decision scholars, despite having being observed and noted by scholars in practice domains.

The fourth area this research touched on was the narrative persuasion field, which arose in the last decade or so. There have been only a handful of studies exploring narrative persuasion in the decision context, and those only addressed other-oriented influence—the use of narratives to influence people’s decisions (e.g., West et al., 2004). We propose that narratives can be used by deciders themselves for self-persuasion and other-oriented justification purposes. This idea was inspired by our observations of decision makers’ justifications of their decisions on video (Chen & Yates, in progress), as well as narrative therapy literature which indicates that self-narratives are useful for promoting mental health (King, 2001; Pennebaker, 2000; Pennebaker & Seagal, 1999).

Fifth, this research sought to expand the narrative persuasion literature in general. Past researchers have focused on the persuasive nature of other aspects of narratives—coherence (e.g., Baumeister & Newman, 1994; Pasquier, Rahwan, Dignum, & Sonenberg, 2007; Rideout, 2008), causality (e.g., Pennington, 1981; Pennington & Hastie, 1988, 1993; Sloman, 1993, 1994), concreteness (Schank & Berman, 2002), imagery (e.g., Green et al., 2002), vividness (for a review, see S. M. Smith & Shaffer, 2000), emotionality (Escalas et al., 2004; Oatley, 2002; for a review, see Crano & Prislin, 2006), transportation into the narrative world (Green & Brock, 2000; Prentice & Gerrig, 1999; for a review, see Appel & Richter, 2007), empathy for (Zillmann, 1991) identification with the hero (Dal Cin, Zanna, & Fong, 2004; Schank & Berman, 2002), and relevance to audience (Schank & Berman, 2002). There has as yet been no such exploration of the persuasiveness of conflict resolution and problem solving in narratives, however. We theorize that being able to anticipate and solve problems with decision options aids both self- and other-persuasion. Anticipating and being able to solve option downsides should help assure the decider and other people that those downsides really can be removed. It should make the decider look wise and competent to others when justifying his choice as well. Over time, planning repairs should help develop people's internal locus of control (the amount of control that they believe they have over events that affect them; Rotter, 1954), as well as self-efficacy (belief in their own abilities to achieve goals; Bandura, 1977). They may end up choosing not to go through with the repairs, but they would at least know that there are things they can do about disliked situations.

4.6 Empirical Questions Recap and Studies Overview

For easier viewing, the four sets of empirical questions addressed by this dissertation are listed here again. As was discussed above, Q1 has descriptive significance, while Q1, Q2, and Q3 each has both explanatory and prescriptive significance.

- Q5: Prevalence—What is the prevalence of the use of decision matrices, prospective option repairing, and prospective storying among decision makers?
- Q5a: Do people spontaneously use decision matrices, prospective narratives and/or option repairs when making multi-attribute decisions? What percentage of them do so?
- Q5b: Is the use of prospective narratives, repairs, and matrices mediated by certain personal characteristics of the deciders?
- Q5c: If people do use prospective repairs or stories, do they generate them for all options, or only for the option they eventually choose? Is this mediated by certain personal characteristics?
- Q6: Self-Persuasion and Implementation Effects—Would making decisions on the basis of matrices, repairs, or narratives serve self-persuasion or decision implementation purposes?
- Q6a: Which form(s) of presenting decision explanations are (more) effective for increasing self-persuasion, implementation intention, and anticipated other-persuasion—matrices, prospective repairs, or prospective narratives?
- Q6b: Is the impact of the approaches on decision self-persuasion, implementation intention, and anticipated other-persuasion mediated by certain personal characteristics of the deciders?
- Q6c: Are the repairs that people come up with unrealistic for them to execute?
- Q6d: Do people who are instructed to repair only one option end up choosing that option more than those who are instructed to repair all or none of the options? Is this mediated by certain personal characteristics?
- Q7: Process Cost and Benefits— What are the relative process cost and appeal of matrix, repair, and story approaches' to decision makers?
- Q7a: Does use of the prospective narratives and repairs approaches take longer time than the matrix or spontaneous approaches?

Q7b: Do people who are instructed to use the prospective narratives and repairs approaches end up believing them to be as or more useful or enjoyable than those who are instructed to use the matrix or spontaneous approaches?

Q7c: Is the enjoyment and perceived helpfulness of approaches mediated by certain personal characteristics of the deciders?

Q7d: Do people find prospective narratives and repairs more useful when they apply the approaches to all options, or just the one they eventually choose? Is this mediated by certain personal characteristics?

Q8: Other-Persuasion Effects—Would justifying decisions on the basis of matrices, repairs, or narratives serve other-persuasion purposes?

Q8a: Which form(s) of presenting decision explanations are (more) effective for other-oriented justification and influence purposes—matrices, prospective repairs, or prospective narratives?

Q8b: Are differences in effectiveness for the approaches mediated by certain personal characteristics of the audience members?

Q8c: Is it better to be one-sided or two-sided when repairing/storying options for other-oriented justification and influence purposes? Is this mediated by certain personal characteristics?

Study 1 addressed the first, second, and third sets of questions by focusing on decision makers. Study 2 (Chapter 7) addressed the fourth set of questions by focusing on decision audiences. The stories and repairs generated by participants in Study 1 were vetted and used to craft the stimuli for Study 2 (Chapter 6).

As a preview for the reader, our studies operationalized the primary dependent variables of interest as follows:

- Q1
 - Prevalence—percentage of deciders not assigned to use a particular approach who later self-report themselves as having used that approach

- Q2
 - Self-persuasion—anticipated utility, confidence in decision, etc.
 - Implementation likelihood—percent likelihoods that deciders will immediately take action to commit to their choices instead of seeking more options or taking more time to decide
 - Process cost and benefits—approach completion time, self-reported helpfulness and enjoyability of the approach, the extent to which the approach helps deciders think of new ideas

- Q3
 - Other-oriented justification—audience members' judgments of deciders' persuasiveness, perceived wisdom of deciders' choices, etc.
 - Other-oriented influence—audience members' own choices and opinions of the options after reading about deciders' choices and processes

Chapter 5

Study 1—Decision Makers

To recapitulate, we were interested in addressing the broad sets of questions Q1 (approach prevalence), Q2 (self-persuasion and implementation effects) and Q3 (process cost and benefits). Besides obtaining self-reports on the spontaneous use of particular decision approaches, we assigned those approaches to decision makers and compared their effects relative to a spontaneous approach. The approaches were the traditional compensatory scheme described in section Chapter 2 (henceforth, “matrix” approach), prospective option repair as described in section 3.1 (henceforth, “repairs” approach), and prospective narratives as described in section 3.2 (henceforth, “story” approach). The dependent variables of interest included decision self-persuasion, implementation intentions, anticipated other-oriented justification, and various approach assessments. We were also interested in possible interactions between the decision approaches and personal characteristics as measured by certain scales (for details, see section 5.1.7).

5.1 Procedure

For this study we recruited 180 participants via the University of Michigan Introduction to Psychology Subject Pool, the psychology department’s Paid Subject Pool, on-campus flyers, and a campus newspaper advertisement. The participants completed the procedure on computers using MediaLab software and html/JavaScript. The phases subjects completed are charted in Figure 5.1. Participants completed a two-choice decision task, various questionnaires assessing the dependent variables of interest among other things, several personal characteristics scales, and a demographics questionnaire (details to follow).

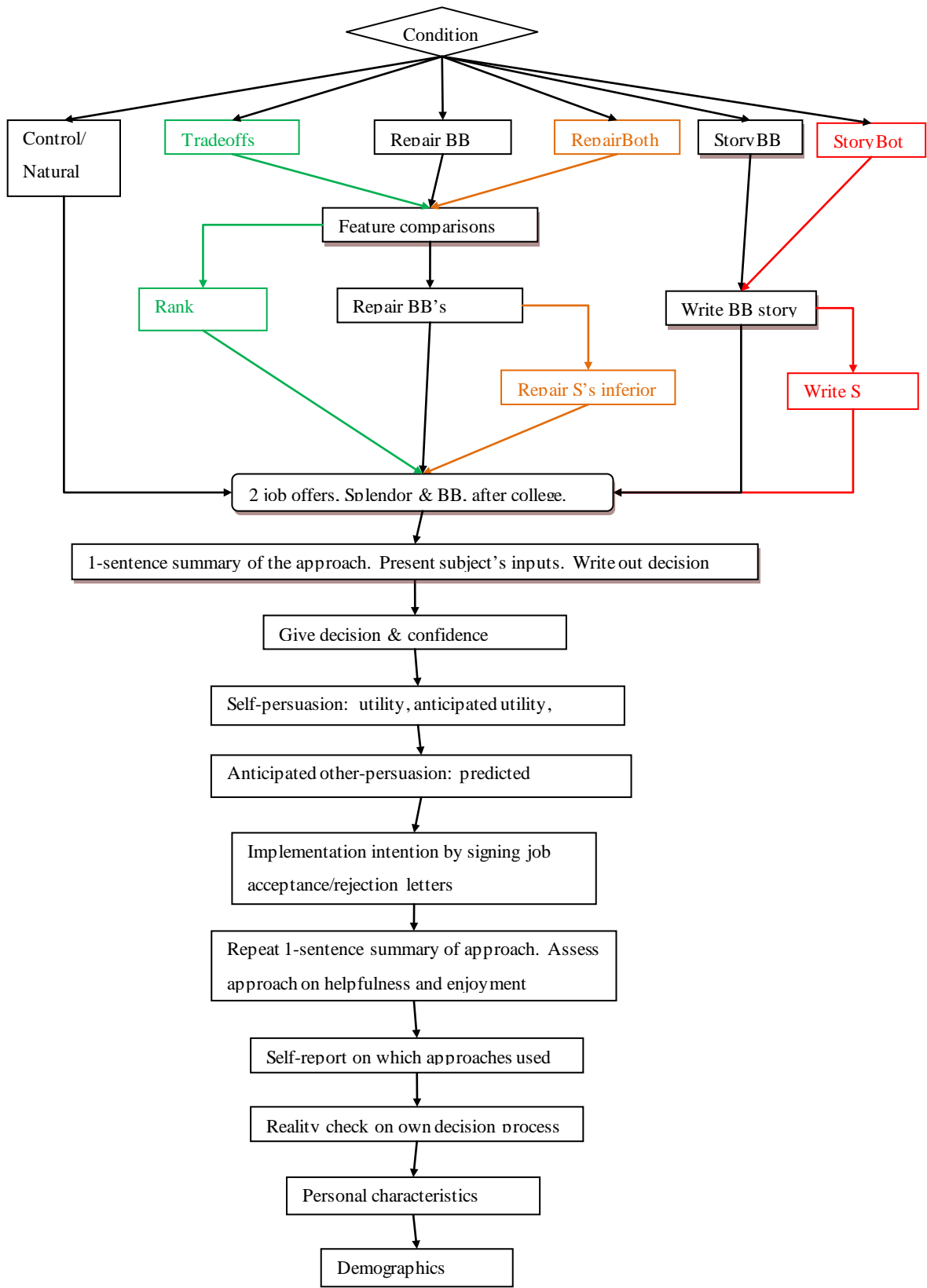


Figure 5.1. Study 1 procedure. Participants (“deciders”) completed preliminary steps to an assigned decision approach, before making a decision using that approach. They then completed various questionnaires and personal characteristics scales. Steps that were only completed in the matrices, repair both options, and story both options conditions are outlined in green, orange, and red, respectively.

5.1.1 Decision approach manipulation and completion

For this between-subjects design, participants were randomly assigned to one of six groups, which differed by the decision approach they would eventually be instructed to use:

1. Control/natural (use whatever approach they wish)
2. Matrix (a simplified version of the traditional compensatory scheme)
3. Repair one option only
4. Repair both options
5. Story one option only
6. Story both options

Eventually, they would have to choose between job offers from two companies, called “Bonnie’s Best” and “Splendor.” (To make the decision non-trivial, the job features were assigned so that the two jobs were more or less comparable.) First, however, participants completed the preliminary steps (if any) to their assigned approaches without any context. This was to ensure that participants did not realize that they would be asked to make a decision and that they did not start using decision approaches other than the ones we planned for them to use.

For instance, the matrix approach group was presented with pairs of job features, and asked to indicate for each pair which feature was superior to the other feature (e.g., working in “a noisy cubicle” versus a “private office,” or having an 18-minute versus a 40-minute commute). On the next screen, they rank-ordered seven job dimensions (i.e., office, commute, salary, etc.) by importance. The two repair groups also made feature comparisons. However, on the next screen, they were presented with the job features that they had previously deemed inferior to the other feature, and told to come up with ways to repair those features. The repair-one-option-only group only made repairs for the Bonnie’s Best features (unbeknownst to them) while the repair-both-options group

repaired both jobs' features. The story groups were led step-by-step through the process of creating prospective stories for the option(s) (see Appendix B for details).

After completing all of the preliminary steps of the approach out of context, participants were presented with the actual decision task. They were told that they must choose between two job offers—from companies named Bonnie's Best and Splendor—using only the approach that we instruct them to. They were then presented with a summary of their assigned approach, followed by descriptions of the jobs and their own responses to the previously-completed steps. For the matrix condition in particular, participants' feature appraisals and dimension rankings were presented back to them in the format of a decision matrix such as the one in Table 5.1 (without the overall appraisals):

Table 5.1. Screenshot of Decision Matrix Displayed to a “Matrix” Condition Participant

Dimensions	Bonnie's Best's Features	Splendor's Features	The company you think is better for this particular dimension	Your rank of the importance of this dimension relative to the other dimensions.
Location	Dull, sparsely-populated industrial area, with one mediocre cafeteria nearby	Located in fun part of town, next to a new mall; many cafes, clothing stores, and cinemas nearby	BB	4
Salary	\$40,800 per year (\$800 above the average salary of a person at your position)	\$39,400 per year (\$600 below the average salary of a person at your position)	BB	6
Commute	18-minute each way	40-minute each way	BB	1
Work atmosphere	Employees generally eat alone in their cubicles	Employees generally go out to lunch in groups, visiting new eateries regularly	S	3
Office	Cubicle in a noisy area	Small, private office	S	2
Vacation package	2 weeks of vacation per year, plus fun retreat in San Diego	2 weeks of vacation per year	BB	7
Rules	Not many rules, but enforcement is strict	Lots of rules, but enforcement seems pretty lax	BB	5

Inside a text box, participants typed in whatever they thought of as they made their decisions. They then indicated their final choices and confidence in those choices.

5.1.2 Self- and anticipated other-persuasion

To assess self-persuasion, we asked participants to indicate their confidence in their choices, how satisfied they were with those choices, how happy they thought they would be in the jobs they chose, and how wise they thought their decisions were. To assess anticipated other-oriented decision justification, participants were told to think of a specific person whose opinion means a lot to them and who cares about them—a parent, teacher, advisor, friend, etc.—and to write in that person’s name. They then predicted how easy it would be to convince that person that the chosen job offer is the best for them.

5.1.3 Implementation intention

We assessed participants’ intentions to implement their choices by showing them acceptance letters that they would have to sign and mail in to the fictitious companies to formally “accept” or “reject” the jobs. To get people to take this implementation intention phase seriously, we emphasized that signing and then retracting job acceptances in their particular industry would have serious repercussions on their reputations in that industry. Participants then indicated the percent likelihoods that they would (a) sign and accept the first job and decline the second job, (b) sign and accept the second job and decline the first job, and (c) think over the matter some more or continue searching. We had employed this same phase in a prior study (Chen & Yates, in progress). Sixteen percent of the participants would not have implemented their choices right away. On average, participants were 23% likely to wait to implement their choices right away.

5.1.4 Reality check

Question 3e brought up the concern that some aspects of decision approaches may be used merely to convince the self to commit to an option, and are actually not realistic for the person to achieve after the choice has been made. For instance, a person may tell himself that he would make a certain repair to his favored option, only to not follow

through on it once he has taken that option. To see what sorts of responses participants proposed earlier that were not realistic, we asked participants to perform a simple reality check themselves. We displayed their own responses to the steps of the approaches again. We asked them to review each sentence they wrote, and to note any that on further reflection were unrealistic for themselves.

5.1.5 Approach assessments

The MediaLab software recorded the amount of time spent completing each stage of the experiment. To see what people themselves thought about the decision approaches (Questions 3a-3c), we presented the participants with one-sentence summaries of the approaches we instructed them to use. Among other things, we asked them to rate their particular approaches on helpfulness and enjoyment, and to write in what they thought were the strengths and weaknesses of those approaches. The enjoyment and helpfulness questions were based off the enjoyment question used in West et al.'s (2004) study, which found that people enjoy writing stories about the self as more than either writing dialogues or writing stories about other people.

5.1.6 Approach manipulation check and prevalence (Q1)

For a simple manipulation check, we listed the one-sentence summaries of our tested approaches and asked people to check off the ones they used, as well as write in any approaches they used that were not on our list. If our approach instructions worked, the reasoning went, participants should check off the approach that we asked them to use. Allowing people to check off approaches in addition to the ones they were assigned enabled to us address the Q1 description questions.

5.1.7 The personal characteristics scales

We administered personal characteristics scales toward the end of the study. The scales we used in this study were Subjective Numeracy, Narrative Transportability, Actively Open-Minded Thinking, for the following reasons:

The Subjective Numeracy scale (Fagerlin et al., 2007) measures people's self-assessed numerical aptitude and preferences. Individuals who are good with and like

numbers may be more easily persuaded by decision approaches that use numbers, such as our decision matrices. We hypothesized that the effectiveness of the matrix approach may be mediated by people's aptitude and preference for numbers, as measured by the Subjective Numeracy scale.

The Narrative Transportability scale measures individuals' tendency to become absorbed in narratives when reading them (Dal Cin et al., 2004). Decision making using the story generation approach may thus be more effective for high transportability individuals. How effective the story approach is may be mediated by people's propensity to become transported into narratives, as measured by the Narrative Transportability scale.

The Actively Open-Minded Thinking scale (Stanovich & West, 1997) is linked to people's willingness to be open to and actively search for alternative evidence, solutions, or interpretations to their existing beliefs. People who score higher in "cognitive disposition measures" such as AOT tend to value objective data processing more than low-scorers (for a review, see Mitchell, 2002). High AOT scorers may thus be more compelled by decision approaches in which they shore up all options as opposed to just their favored options. How effective shoring up both options (a two-sided decision approach) is relative to shoring up the chosen option only (a one-sided approach) may be mediated by people's openness toward and active seeking of evidence against their existing beliefs, as measured by the Actively Open-Minded Thinking Scale.

5.2 Q1 (Prevalence) Analyses and Results

Do people spontaneously use prospective option repairs and stories when making multi-attribute decisions? First, we found that 98% of deciders self-reported themselves as having used at least one of our approaches of interest. Of those people, half used only one of our approaches. Half actually used two or more approaches. This was predicted by actively open-minded thinking, $t(176) = 2.30, p = .03$.

Next, we computed the frequency of each of the various types of approaches (see Table 5.2) across the conditions. In an ideal study, to assess descriptive frequencies of

the approaches, one should only look at the control subjects. However, this experiment only had 30 control subjects—a low sample size. To provide further evidence, therefore, for each approach we also computed the frequency among all subjects who were *not* assigned to the corresponding condition(s). For the repaired chosen variable, for instance, we computed the percentage of people *not* in either of the two repair groups, who self-reported as having repaired their chosen option.

Table 5.2. Percentages of Deciders Who Self-Reported As Having Used Particular Approaches

Group	Matrix	Repaired					Storyed					Other
		BB	Chosen	Rejected	Both	1+ options	BB	Chosen	Rejected	Both	1+ options	Gut instinct
Control ^a	97%	40%	53%	23%	20%	57%	63%	83%	50%	47%	87%	3%
Matrix ^b	100%	47%	81%	19%	16%	84%	53%	78%	31%	31%	78%	6%
Repair BB ^c	97%	60%	77%	37%	33%	80%	60%	77%	40%	37%	80%	10%
Repair Both ^d	97%	63%	90%	40%	37%	93%	60%	83%	47%	43%	87%	0%
StoryBB ^e	96%	54%	69%	38%	35%	73%	73%	85%	54%	50%	88%	4%
Story Both ^f	87%	47%	73%	30%	30%	73%	70%	77%	60%	60%	77%	3%
<i>n</i>	146	118	118	118	118	118	122	122	122	122	122	178
All conditions other than the corresponding approach	95%	47%	69%	27%	25%	72%	65 [^]	80%	42%	39%	83%	4%

Notes. The percentages of decider participants who self-reported as having used their assigned approaches as instructed are highlighted by boxes.

^a*n* = 30. ^b*n* = 32. ^c*n* = 30. ^d*n* = 30. ^e*n* = 26. ^f*n* = 30.

Happily, the percentages for the control subjects (the first row) mirrored those across the conditions (the last row) fairly well. This gives some assurance that these percentages reflect somewhat the descriptive prevalence of the approaches within a general population. We make the following observations based on the percentages:

- Pros and cons: Almost everyone claimed to have weighed the pros and cons of the decision without being told. Apparently, people do value

the ability to compare features side-by-side, even if not precise in numerical schemes.

- Repair: Fifty-seven percent of the control group and 72% across the conditions claimed to have repaired at least one of the options.
- Story: Eighty-seven percent of controls and 83% across the conditions claimed to have storied at least one of the options.
- Other approaches: A small percentage of deciders wrote down that they used their gut instincts when making their choices.

Question 1c asks whether people are one-sided or two-sided when it comes to repairing or storied options. The table suggests that people are one-sided. The percentages of people who repaired or storied their chosen options were at least double those of people who repaired or storied their rejected options.

As for the question of personal characteristics (Q1b), we could not run a quantitative test for the matrix/pros-and-cons approach. Almost all deciders self-reported as using the pros-and-cons approach, making the question moot. In addition, we checked for an interaction between actively open-minded thinking with two-sidedness. To do this, we created a *used-sidedness* variable such that a value of 2 indicated that the decider claimed to be two-sided in both repairs and stories, 1 indicated that the decider claimed to be two-sided with repairs but one-sided with stories, or vice versa, and 0 indicated neither of the above. We found no interaction between this variable and actively open-minded thinking, $t(177) = 0.99, p = .32$.

Finally, we noted that on average, people self-reported as having used two of the three approach types we studied. This was especially true for actively open-minded thinking individuals, $t(177), p = .02$. This suggested that people do combine multiple approaches when making decisions.

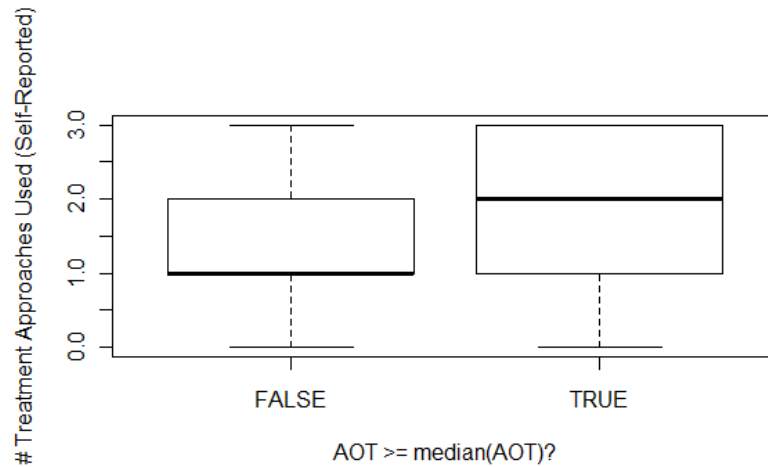


Figure 5.2. Number of treatment approaches used by deciders, according to self-reports. Bars indicate standardized errors.

5.3 Approach Manipulation Check

For the same ceiling effect reason as above, we could not conduct formal manipulation checks for the tradeoff and story conditions. Looking at the demarcated percentages in Table 5.2, however, the percentages of repair and story subjects who self-reported themselves as repairing and storying, respectively, the option(s) we instructed them to were lower than one might have hoped. For instance, the percentage of deciders in the repair-both condition who self-reported themselves as having considered repairs for *both* options was only 37%. It is possible that people's memories for the approaches they used were faulty. Another potential explanation is that people did not find their own generated option repairs/stories realistic or useful for them. After all, the deciders were deliberately not told the true purposes of the repairs and stories until after they generated them. The most likely explanation, however, is that people were one-sided in their decision process and stopped the process as soon as they found their leading option to be "good enough." In other words, they satisficed (à la Klein, 1996; H. A. Simon, 1982). This was supported by the fact we already noted in the previous section, that the number of deciders who used the repairs and stories for their chosen options far exceeded those who used them for their rejected options. In any case, it appeared that assigning people to repair or story particular options did not guarantee that people used repairs or stories for those options or only those options in their decision processes.

Regarding option repair in particular, we did find that people in those conditions were more likely to use repairs than participants in the other conditions ($z = 2.14, p = .032$). This provided additional support for the notion that people tend not to think of doing option repairs unless told to do so.

5.4 Q2 (Self-Persuasion and Implementation) Analyses and Results

5.4.1 Dependent variables

Study 1's primary purpose was to test the effects of our various treatment approaches relative to the control approach on the following sets of dependent variables:

- Decision persuasion
 - Choice confidence
 - Anticipated satisfaction with chosen option)
 - Decision anticipated other-persuasion (i.e., how easy it will be to convince audiences of the goodness of one's decision)
- Decision implementation intention (i.e., likelihood of committing to the chosen job by sending out acceptance/rejection letters)
- Approach utility
 - Approach helpfulness
 - Approach enjoyment
 - New ideas (whether new ideas were generated due to the approach or not)

Because they were left-skewed, for all analyses, we applied log and quadratic transformations to the dependent variables and the subjective numeracy independent variable, respectively, to make them more normal:

$$\text{dependent variable}_{\text{transformed}} = 1 - \ln [\max(\text{dependent variable}_{\text{original}}) + 1 - \text{variable}_{\text{original}}]$$

$$\text{subjective numeracy}_{\text{transformed}} = \text{subjective numeracy}_{\text{transformed original}} + \text{subjective numeracy}_{\text{original}}^2$$

For all dependent variables, we found and removed any high leverage points—points that unduly affected coefficient estimates—that revealed themselves in halfnorm plots (Faraway, 2005b).

5.4.2 Independent variables and tested models

For the independent variables, we created dummy variables, with values of either 0 or 1, to represent each of the four treatment conditions. To test for main effects of the assigned approaches on the dependent variables relative to the control approach using treatment contrasts, we ran the following model, summarized using the modified Rogers-Wilkinson notation (Chambers & Hastie, 1992):

$$\text{dependent variable}_{\text{decider}} \sim (\text{dummy}_{\text{matrix}} + \text{dummy}_{\text{repairBB}} + \text{dummy}_{\text{repairBoth}} + \text{dummy}_{\text{storyBB}} + \text{dummy}_{\text{storyBoth}}) + \text{completion time}$$

The total amount of time spent on completing the steps for the instructed approach was included as a control variable. This was to ensure that any differences left between the approaches' effects on the dependent variables were not simply due to the amount of time and effort that participants spent on the approaches, as opposed to the actual contents of the approaches. After all, one may feel confident of a decision and decision approach simply because one has put more time into them. In addition, it has been shown that writing about their choices increases people's confidence in those choices (Sieck & Yates, 1997).

In addition, we tested whether particular personal characteristics mediated the effects of corresponding decision approaches:

$$\text{dependent variable}_{\text{decider}} \sim \text{Subjective Numeracy}_{\text{decider}} \times \text{dummy}_{\text{matrix}}$$

$$\text{dependent variable}_{\text{decider}} \sim \text{Narrative Transportability}_{\text{decider}} \times (\text{dummy}_{\text{storyBB}} + \text{dummy}_{\text{storyBoth}})$$

$$\text{dependent variable}_{\text{decider}} \sim \text{Actively Open-Minded Thinking}_{\text{decider}} \times \text{sidedness}$$

Sidedness was a dummy variable that represented whether a decision approach was two-sided, one-sided, or unknown. Each of the treatment approaches could be classified as either two-sided or one-sided. The matrix approach was classified as two-sided since it forced users to consider all dimensions for both options. We created the sidedness dummy variable by summing the dummy variables for the three two-sided conditions:

$sidedness = (dummy_{matrix} + dummy_{two-sided\ repair} + dummy_{story})$, where

- 1 = two-sided (matrix, repair both, or story both condition)
- 0 = one-sided (repair BB only or story BB only condition)
- NA = unknown (control condition)

We employed linear regression for all models save the “new ideas” ones. Since the “new ideas” variable was binary, we employed binomial regression when running its models. Due to multicollinearity concerns, we removed non-significant terms from the personal characteristics models one-by-one via backward elimination, with p -value = .05 as our cutoff (Venables & Ripley, 2002).

5.4.3 Choice agreement independent variables and decision persuasion models

It makes sense that a given approach would only affect the self-persuasion, anticipated persuasion, and implementation intention of a decision if the results of the approach happened to be consistent with the chosen option. For instance, repairing Bonnie’s Best should only be positively correlated with decision self-persuasion if the person actually chose Bonnie’s Best. Unfortunately, since we assigned the approaches to deciders randomly, there was no guarantee ahead of time whether the approaches would match the direction of the deciders’ eventual choice or not. As for the story conditions, we wanted deciders to give the stories endings that were realistic for them; we did not control whether those endings were happy for the jobs or not. Instructing someone to write a story about a particular job did not guarantee whether that story would be happy or unhappy with respect to that job and hence, whether it favors or disfavors taking that job. Someone in the story Bonnie’s Best only condition would be highly-persuaded

about choosing Bonnie's Best if his story showed Bonnie's Best in a positive light, but would be highly-unpersuaded if his story showed that job in a negative light.

In order to give the decision approaches fair tests, therefore, it was insufficient to include predictors based on what conditions the deciders were assigned to. We needed to include predictors that represented whether the corresponding approach supported the final choice or not. More specifically, a positive value would indicate that the decider chose the option supported by the approach, while a negative value would indicate the opposite.

For the decision persuasion models, therefore, we included three additional predictor variables, corresponding to each of the three kinds of decision tactics we studied:

- *Matrix-choice agreement*—For the matrix deciders, we took the overall decision matrix score for the chosen option and subtracted the overall score for the rejected option; we assigned a value of 0 to the other deciders.
- *Repair-choice agreement*—This was a binary variable, with 1 indicating that the chosen option was the only option that was repaired, and 0 otherwise.
- *Story-choice agreement*—As will be described in section 6.1.1 below, project team members read each story and noted whether it was happy or unhappy with respect to the job about which it was written. For each decider, we assigned their stories +1 if they supported the decider's eventual choice (i.e., happy about the chosen job or unhappy about the rejected job) and -1 if they were inconsistent (i.e., unhappy about the chosen job or happy about the rejected job). Scores of 0 were assigned if the decider was not told to write a story for a given job. We then summed the story scores for each decider.

Those models then became the following (with the additional terms highlighted in bold):

dependent variable_{audience} ~ (dummy_{matrix} + dummy_{one-sided repair} + dummy_{two-sided repair} + dummy_{story}) + (**matrix-choice agreement** + **repair-choice agreement** + **story-choice agreement**) + completion time

dependent variable_{decider} ~ Subjective Numeracy_{decider} × (dummy_{matrix} + **matrix-choice agreement**)

dependent variable_{decider} ~ Narrative Transportability_{decider} × [(dummy_{storyBB} + dummy_{storyBoth}) + **story-choice agreement**]

The AOT/sidedness model was unaffected and thus the same as listed above.

The resultant models are displayed in Table 5.3.

Table 5.3. Effects of Decider Approaches and Personal characteristics on Decider Self-Reports (Relative to Control/Spontaneous Approach)

Variable	Decision self-persuasion ^d			Implementation	Approach assessment		
	Choice confidence ^b	Anticipated happiness	Anticipated persuasion	Implementation intention	Helpfulness	Enjoyment ^c	New ideas
	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Main effects of approaches (and approach-choice agreement if applicable) ^e							
Intercept	.04***	.40	-.50	-.18***	-.07	.20*	-.17***
Approach							
Matrix	-.16	-.13	-.09	.17	.11	-.24'	1.04'
Repair BB only	-.25*	-.19	.08	-.02	.07	-.86	1.64**
Repair both	-.10	-.06	.14	.87*	-.12	-.30*	1.31*
Story BB only	.11	-.07	.28	.33	-.40*	-.79***	1.27
Story both	.39*	-.20	.04	.69	-.30	-.66**	.67
Approach-choice agreement							
Matrix score	.03**	.03**	.02	.06			
Repair	.10	.17	.07	.84'			
Story	.74	.19**	.12	.29'			
Completion time	≈000	≈000	≈000	-.002	≈000	≈000	≈000
Personal characteristics effects ^f							
Intercept	.19*	-.002	—	—	—	—	—
Subjective numeracy (SN)	.01*	< .01	—	—	—	—	—
Matrix approach	.02'	-.54*	—	—	—	—	—
SN × Matrix approach	—	.03*	—	—	—	—	—
Intercept	.30***	—	-.08	—	-.04	.06	-.69**
Narrative transportability (NT)	-.01	—	.09*	—	.09**	.08*	.34*
Story BB only	-.04	—	—	—	—	-.43***	.82'
Story both	.38***	—	—	—	—	-.26*	—
NT × Story BB only	.16*	—	—	—	—	—	—
NT × Story both	—	—	—	—	—	—	—
Story-choice agreement	—	—	.02	—	—	—	—
NT × Story-choice agreement	—	—	.12*	—	—	—	—
Intercept	.29***	—	—	—	-.04*	—	-.81**
Actively open-minded thinking (AOT)	—	—	—	—	.18**	—	.72*
Sidedness ^a	.12'	—	—	—	—	—	—

Notes. $n = 178$ unless otherwise indicated. All dependent variables except one were log-transformed to make them more normal. The new ideas dependent variable was binary and therefore left untransformed. The subjective numeracy independent variable was quadratic-transformed to make it more normal. For ease of reading, listed intercepts and non-significant terms are grayed out.

^a $n = 148$ since the control condition was not applicable. ^b $n = 176$. Two high leverage points were removed. ^c $n = 177$. One high leverage point was removed. ^dApproach-choice agreement variables were included as possible predictors, and approach completion time was included as a control variable. ^eFull models are presented. ^fBackward elimination was employed to eliminate non-significant terms (denoted by –). Rows with all non-significant terms are not displayed. ^g $p < .10$. ^h $p < .05$. ⁱ $p < .01$. ^j $p < .001$.

5.4.4 Effects of approaches on decision self-persuasion and implementation

To aid interpretation, we plot the personal characteristics interactions we found in Figure 5.3.

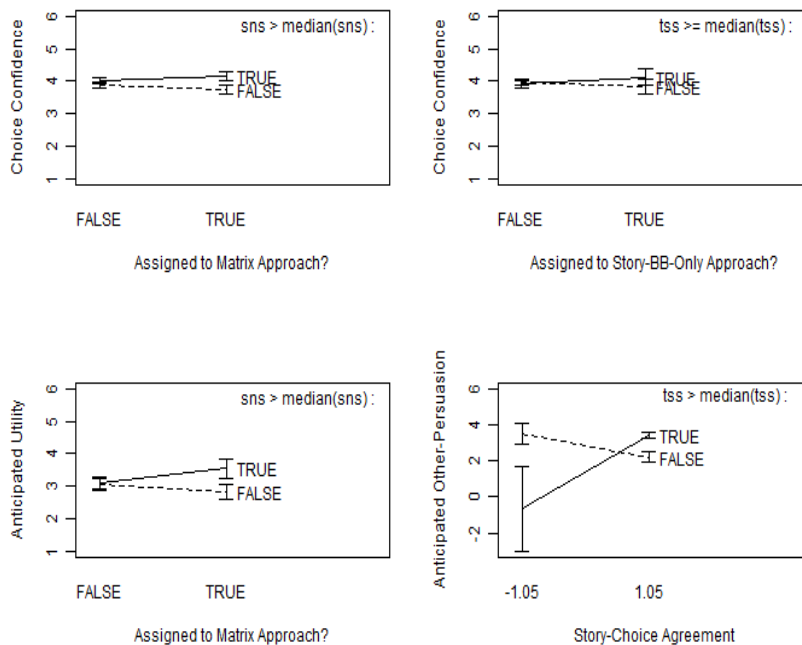


Figure 5.3. Matrix approach-subjective numeracy and story-narrative transportability interactions on decision self-persuasion dependent variables. Vertical lines depict standard errors of the means. All interactions were significant, save for the one depicted in the upper left-hand corner. The matrix approach resulted in higher self-anticipated utility than did the control approach, but only for high subjective numeracy deciders. The same positive relationship holds for between the one-sided story approach and narrative transportability. Finally, the extent to which their stories supported their choices predicted high narrative transportability deciders' confidence in their ability to justify their choices, but the effect was reversed for low transportability deciders.

Decision matrix score- and story-choice agreement did predict self-persuasion in deciders. However, personal characteristics mediated the effects of instructing subjects

to use those approaches. Those two approaches resulted in higher self-persuasion than the control approach only for deciders high in subjective numeracy and narrative transportability, respectively. Anticipated persuasion was significantly predicted only by story-choice agreement, and then only for high narrative transportability deciders. This was consistent with narrative persuasion research which shows that the effects of stories are mediated by narrative transportability (Green & Brock, 2000).

5.4.5 Realism of responses

The repair (both) approach was the only one that significantly aided decision implementation. This was as we predicted based upon prior research (discussed in section 4.2.1) showing that specific and concrete plans aid action implementation.

Were the responses of the deciders unrealistic for them? To answer this question Q3e, for each decider, two independent coders took the ‘reality check’ responses the decider wrote and assigned a *realism* code of 1 if the decider reported that nothing in his or her own responses to the instructed decision approach appeared unrealistic and 0 otherwise. The coders agreed on 98% of the cases. The coders came to a consensus on the three cases on which they disagreed. We summed the dummy variables for the two repair approaches and the two story approaches to yield *repair condition* and *story condition* dummy variables, respectively. Binomial regressions of the realism variable on the three dummy variables—matrix condition, repair condition, and story condition—showed that none of the instructed approaches resulted in significantly lower self-reported realism than the control (natural) approach. The approaches with the largest difference in realism from the control approach, prospective story, had a z -value of -1.03, $p = .30$. This finding helped allay some of the concern that option repairs and stories, despite their self-persuasion benefits, may be too unrealistic for us to recommend them as decision making approaches.

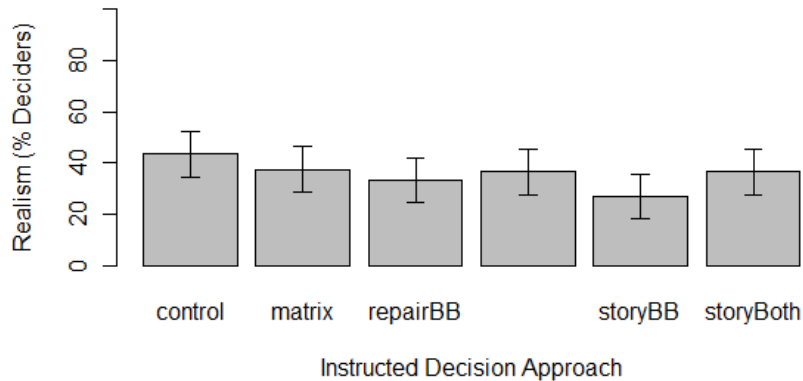


Figure 5.4. Percentage of deciders who rated all of their responses to their instructed approaches as realistic. Vertical lines depict standard errors of the means. None of the treatment approaches resulted in significantly lower self-reported realism than the control (natural) approach.

5.4.6 Effect of repairs on choices

Q2c asked whether people who are instructed to repair only one option end up choosing that option more than those who are instructed to repair all or none of the options. The idea is that repairs are supposed to improve options and thereby enhance them in the eyes of decision makers; therefore, repairing certain options without repairing others should lead more people to choose the repaired options. To check this, we tested whether being assigned to the repair Bonnie’s Best only condition led to higher likelihood of choosing Bonnie’s Best. This did not occur. Although the direction of the effect was as expected, the effect was not significant, $z = -1.47, p = .14$.

We suspected that this could be due to our earlier finding that deciders were bothered by the one-sided only approach. It could be that once they were instructed to repair one option, many of them proceeded to apply the repair approach to the other option as well when making their choices. Indeed, we did find significant effects when we tested the self-reported actual use of Bonnie’s Best and Splendor repairs. Deciders who self-reported as having repaired Bonnie’s Best were more likely to have chosen it, $z = -4.75, p < .001$, while those who self-reported as having repaired Splendor were more likely to have chosen Splendor, $z = 6.36, p < .001$.

5.5 Q3 (Process Cost and Benefits) analyses and results

Did certain approaches take longer than other approaches to complete? Indeed so, as illustrated in Figure 5.5. We summed up the amount of time deciders took to complete each step of their assigned approaches to yield a total approach completion time variable. We log-transformed that variable to make it more normal, then regressed it on the approach condition. The story approaches were especially long to complete—taking an average of at least three times as much time as the longest of the other treatment approaches. Pairwise comparisons using Tukey’s HSD method (Miller, 1981; Yandell, 1997) showed that all pairwise differences between approaches were significant at the .05 level, save for those between the one-sided and two-sided versions of the repair and story approaches. To summarize, with respect to completion time:

stories >> option repairs >> decision matrices >> control (natural) approach

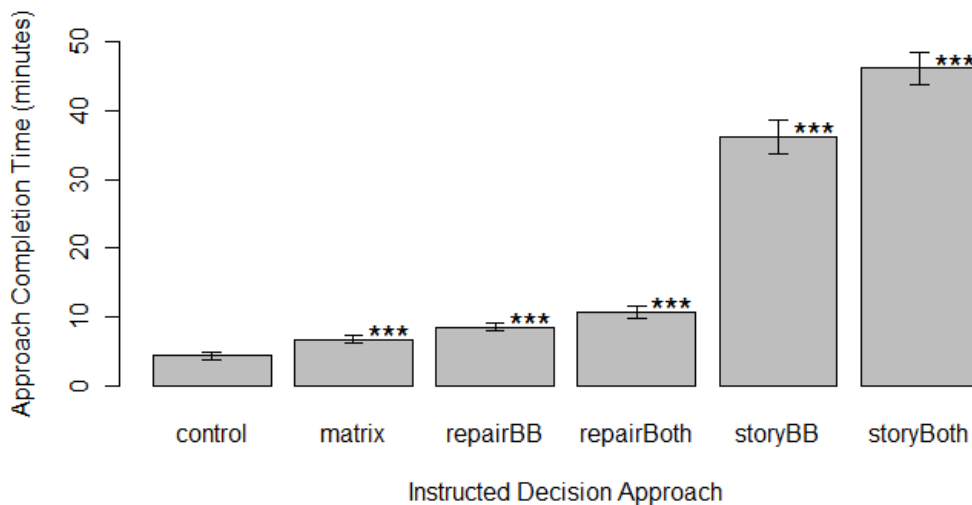


Figure 5.5. Time to complete assigned decision approaches. Vertical lines depict standard errors of the means. Asterisks indicate the significance of the treatment approaches compared to the control approach. All of the treatment approaches took longer to complete than the control (natural) approach—the story approaches especially so. $p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

The repair approaches were the only ones that a significant number of deciders indicated as inspiring them to think of things they would not have considered. In contrast, enjoyment did not turn out to be a decision process benefit of using our tested

approaches. The deciders found almost all of the treatment conditions to be less enjoyable compared to the control (natural) condition (see Figure 5.6). Apparently, the people either did not care for the effort needed to complete the approach phases, or disliked being constrained in their decision processes. Deciders in the story BB only condition actually rated it negatively. A few of the story condition participants mentioned that they in particular do not like writing stories in general, suggesting that personal characteristics do play a role in people's enjoyment of story writing.

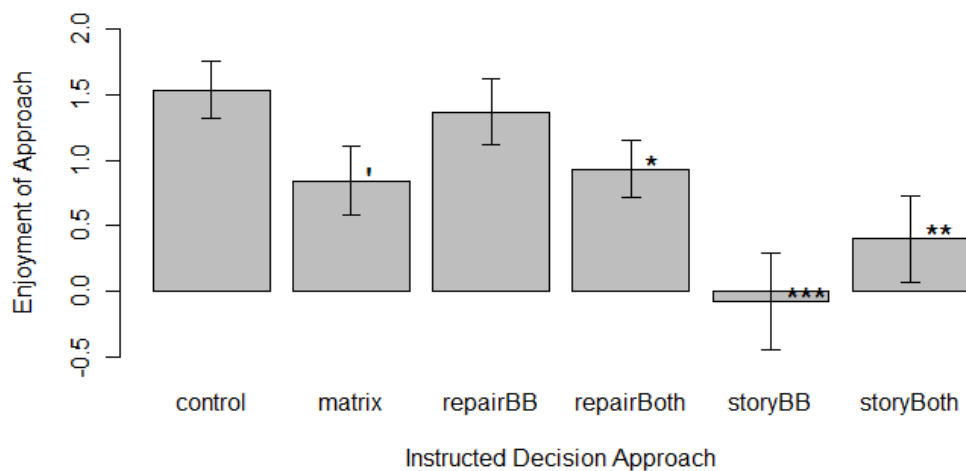


Figure 5.6. Deciders' enjoyment of assigned decision approaches. Vertical lines depict standard errors of the means. Asterisks indicate the significance of the treatment approaches compared to the control approach. All of the treatment approaches (with the exception of repair BB only) were rated as less enjoyable than the control (natural) approach. $p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

These results suggest that repairs will be easiest to impart of the three major types of approaches, and that stories will be the hardest.

5.6 Discussion

Study 1's major goal was to address Explanation question Q2 by comparing and contrasting the effects of various approaches on decision makers in terms of self-persuasion and implementation intention, as well as Adoptability question Q3 by soliciting decision makers' assessments of the approaches. It also touched on Description question Q1 by having decision makers self-report which of our interested approaches

they used without being told to by us. We pitted five treatment approaches—the traditional decision matrix, repair one option only, repair both options (two-sided option repair), story one option only, and story both options (two-sided story repair)—and a control approach—use whatever approach people want—against one another and compared their effects on decision makers. Decider participants were led step-by-step through their assigned approaches and then told to use those approaches to choose between two job offers. They then completed questionnaires about their choices, implementation of their choices, decision processes, the approaches, personal characteristics, and demographics. See Table 8.1 in the concluding chapter for a graphical summary of the studies' key results.

5.6.1 Approach manipulation check

Despite our asking them to use the instructed approach only when making their decisions, people self-reported as having used the other approaches as well. The bad news this conveyed was that despite all our best efforts, it is hard to force decision makers to only use approaches that one instructs them to. To achieve that in Study 1, we would have had to force our participants to make a choice within 5 seconds of viewing their previous responses. But doing so would have weakened the experiment's external validity for prescription purposes. The good news from our finding was that the study was more ecologically valid than it would have been had people only used the approaches we asked them to. In real life, of course people would use whatever approaches they want to use, not just the ones that they are told to use by someone else. Another silver lining of our finding was the fact that people spontaneously used the approaches even when we did not ask them to, ironically enabling us to address somewhat the Descriptive question Q1.

5.6.2 Prevalence (Q1)

Q1:Prevalence—What is the prevalence of the use of decision matrices, prospective option repairing, and prospective storying among decision makers?

Q1a: Do people spontaneously use decision matrices, prospective narratives and/or option repairs when making multi-attribute decisions? What percentage of them do so?

Q1b: Is the use of prospective narratives, repairs, and matrices mediated by certain personal characteristics of the deciders?

Almost all decider participants used at least one of the approaches we were interested in. Participants high in actively open-minded thinking used more than one of those approaches, suggesting that they do at least subconsciously realize the benefits of combining approaches.

Decider self-reports also indicated that weighing of pros and cons was a nearly universal approach, while prospective storying and prospective option repairs took second and third place, respectively. Calculating the frequency of approaches as self-reported by decider participants showed that almost all of them employed some form of table comparing pros and cons and assigning overall scores to options without being asked to by us. Most (about 80%) self-reported as having used a prospective story approach, while 71% self-reported as having used a prospective option repair approach.

We only found a marginal positive effect of narrative transportation for the story approach. A scale assessing people's propensity for creating, not just reading stories would have been more helpful. Unfortunately, no such scale existed at the time. In future studies, we would introduce certain personal characteristics scales that might predict the use of option repairs for decision making. The Proactive Coping Inventory (Greenglass, Schwarzer, & Taubert, 1999), for instance, should predict the likelihood that people will engage in option repair without being prompted to do so. In addition, creativity and problem solving scales should predict the number of repairs that people generate. Support for this comes from the negotiation literature, which showed that creativity helps negotiating parties improve their joint gains (Kurtzberg, 1998) and suggested ways to encourage "creativity and problem solving."

Since virtually all deciders employed matrices, testing for personal characteristics in the use of decision matrices was moot. This last finding seemingly contradicts those of

past studies showing that people did not like compensatory schemes due to their time and effort consumption. From deciders' comments, we received the impression that people do like side-by-side feature comparisons. We posit that they may just not like the complicated schemes used to elicit and integrate numerical values and weights. The decision matrices studied by traditional decision theory and us confound numbers with the table format. Future work should separate the two to see which ones people truly like and dislike. One could, for instance, test the simple method proposed by Ben Franklin in 1772 (MacCrimmon, 1973) to weigh options' pros and cons against one another, a method which does not require computation.

Q1c: If people do use prospective repairs or stories, do they generate them for all options, or only for the option they eventually choose? Is this mediated by certain personal characteristics?

The frequency table we created from the data indicated that deciders were more one-sided than two-sided. Most only repaired their eventually chosen option. There was no effect of actively open-minded thinking on this. There are two possible explanations we can think of. One is that people really do take the quick, and perhaps lazy, way of only bothering to simulate and verify whether their favored option is "good enough" and feasible, then ending the decision process if so (as discussed by Klein, 1996; Koehler, 1991). Another explanation is that stories and repairs are only used by decision makers in the service of spreading alternatives and convincing themselves to commit to their favored options.

This study has some limitations for addressing Q15.2 above. However, we believe that if one were to conduct a think-aloud protocol to answer Q1, one would be likely to obtain even *stronger* results. For one thing, we had explicitly asked deciders to only use the approaches we instructed them to. If we had encouraged them to use whatever approach they wanted, plausibly even more of them would have done so. For another thing, deciders may have forgotten that they used some of the approaches due to faulty memory, thus leading to underestimation of approach prevalence.

5.6.3 Self-Persuasion and Implementation Effects (Q2)

Q2: Self-Persuasion and Implementation Effects—Would making decisions on the basis of matrices, repairs, or narratives serve self-persuasion or decision implementation purposes?

Q2a: Which form(s) of presenting decision explanations are (more) effective for increasing self-persuasion, implementation intention, and anticipated other-persuasion—matrices, prospective repairs, or prospective narratives?

Q2b: Is the impact of the approaches on decision self-persuasion, implementation intention, and anticipated other-persuasion mediated by certain personal characteristics of the deciders?

Q2c: Are the repairs that people come up with unrealistic for them to execute?

Q2d: Do people who are instructed to repair only one option end up choosing that option more than those who are instructed to repair all or none of the options? Is this mediated by certain personal characteristics?

Self-persuasion was significantly better for deciders assigned to the two-sided story approach than for those assigned to the control approach. The matrix approach only had a positive effect on high subjective numeracy deciders. There was a positive interaction as well between narrative transportability and story-choice agreement. Apparently, narrative persuasion does work for persuading oneself about a decision and not just for influencing other people's choices.

As for implementation intention, (two-sided) repair was the only approach that significantly improved it compared to the control approach. This makes sense, given that option repairs are concrete and specific plans for fixing option downsides, and past research showed that making specific and concrete plans aid decision implementation. Despite concerns brought up by some deciders in their comments, on the whole the decider participants did not consider their own responses to their assigned approaches to be unrealistic compared to control participants. This helped allay some of the concern about option repairs and stories being mere wishful thinking with little applicability to

deciders' actual lives. A longitudinal study would be required to verify this (see section 8.6 below).

Prescriptions we might give people making decisions based on these results are as follows. People who want to feel good about their choices should generate prospective stories about their options. They should employ the decision matrix approach only if they prefer numbers to words. People who wish to motivate themselves to implement their choices in a timely manner should try to come up with ways to deal with or improve upon the downsides of the options.

5.6.4 Process Cost and Benefits (Q3)

Q3: Process Cost and Benefits—What are the relative process cost and appeal of matrix, repair, and story approaches' to decision makers?

Q3a: Does use of the prospective narratives and repairs approaches take longer time than the matrix or spontaneous approaches?

Q3b: Do people who are instructed to use the prospective narratives and repairs approaches end up believing them to be as or more useful or enjoyable than those who are instructed to use the matrix or spontaneous approaches?

Q3c: Is the enjoyment and perceived helpfulness of approaches mediated by certain personal characteristics of the deciders?

There were no effects of either personal characteristics or the number of options repaired for any of the dependent variables. Decider participants did not rate the treatment approaches as any more helpful than the control approach. However, self-reports indicated that the repair approaches did give them ideas they would not have thought of otherwise. Perhaps they were referring to just the very idea of option repair.

The two story approaches were both the least enjoyable to decider participants and the most time-consuming. This is consistent with many of the deciders' comments; they stated that the story approach does not suit them because of their lack of creativity and distaste for writing. We could confirm this in the future by asking deciders to rate the *difficulty* of the approaches, not just helpfulness and enjoyment. These findings

highlight an important downside of the story generation approach. Writing stories is more of an art than a science. It takes a lot of practice and there may be a limit as to how well a given individual enjoys it and can do it. Therefore, the story approach may not be practically feasible for someone even if it is theoretically optimal. See section 0 in the concluding chapter for further discussion of this issue and how to resolve it.

The two repair approaches also consumed more time than the matrix approach. A broad implication is that this research on prospective option repairs and stories as decision approaches did *not* find a solution to the “time-consumption” problem that plagues traditionally studied decision schemes, as was discussed in section 2.2.1. These approaches should therefore be left for important decisions on which people would be willing to spend extra time.

Q3d: Do people find prospective narratives and repairs more useful when they apply the approaches to all options, or just the one they eventually choose? Is this mediated by certain personal characteristics?

5.6.5 Additional option repair future directions

Study 1 taught us that option repair is an especially worthy approach to teach people for decision purposes. It is likely to have immediate impact. People tend not to think to do it on their own, and it enables them to think of idea they would not have thought of otherwise. In addition, it increases their likelihood of following through on their choices. Future studies should employ some problem solving and creativity scales to see if they predict the quality of repairs generated by deciders.

Chapter 6

Construction of Justification Stories, Repairs, Decision Matrices, and “Decider” Sketches

We planned Study 2 to compare and contrast the persuasiveness of prospective narratives, option repair, and traditional tradeoff matrices for decision justification and influence purposes. In order to be fair to all the various approaches, we needed for our stimuli good representative samples of each of the three types of approaches. We wished to develop four “decider” scenarios to be used in all five persuasion approach conditions—two in which Splendor is chosen and two in which Bonnie’s Best is chosen. The four scenarios would be identical across conditions, but for the decision justification portions. The scenarios would include autobiographical character sketches of fictional “deciders,” to be taken from the protagonist backgrounds written by the deciders from Study 1 who wrote the winning stories.

To create representative samples of prospective stories, repairs, and decision matrices to be used in the “decider” scenarios, we used as source material the responses generated by the decider subjects from Study 1. For the story condition, we hired panelists to read and rate stories generated by Study 1 deciders and thereby determine the most decision-persuasive ones. We then constructed pairs of stories that favored the same decision and sounded like they could be written by a single person. For the matrix condition, we took the pairs of stories generated for the story condition and constructed tradeoff matrices, with feature ratings and dimension weights inferred from the stories. For the repair conditions, we took repairs generated by Study 1 deciders and eliminated redundancies. We organized the repairs by option, option downside, and specific issue solved by the repairs. Details on the filtering and construction processes follow.

6.1 Story Filtering, Assessment, and Pairs Construction

Our story condition for Study 2 required the use of stories to persuade a decision audience that a decider made the right choice in choosing one job offer over the other. In order to persuade audience participants that a given choice between the two job offers is a good one, we planned to present them with *decision-persuasion story pairs*—i.e., one story showing the protagonist being clearly happy in his projected future life with his chosen job (“happy chosen job story”), followed by a second story showing the protagonist being clearly unhappy in his projected future life with his rejected job (“unhappy rejected job story”). We therefore needed four categories of good, “decision-persuasive” stories--stories about protagonists experiencing the Bonnie’s Best or Splendor jobs and being either clearly happy or clearly unhappy with those jobs.

We sought to find or construct such story pairs from the stories written by decider subjects in Study 1. In phase 1, we filtered out any stories that did not follow our instructions to the writers or were not clear on how happy or unhappy the writers were with the Bonnie’s Best/Splendor jobs. We randomly selected 10 out of the remaining stories for each of the four categories to move on to the next phase. In phase 2, for each category, we hired 20 panelists to read and assess the stories in that category on their decision–persuasiveness. In phase 3, we formed decision-persuasion story pairs by finding pairs of stories from phase 2 that were not only highly rated by panelists, but also did not have any glaring inconsistencies with one another.

6.1.1 Phase 1—story filtering

In order to meet project time constraints, in phase 1 we applied simple and strict algorithms to filter out poor decision-persuasion stories. Recall that in Study 1 we gave decider subjects in the story conditions instructions to write stories that were realistic and incorporated the following—protagonist background, supporting characters, events and actions, emotions, problem solving, clear ending. Two project team members independently rated all of the stories from Study 1 on the presence or absence of these seven characteristics. Any stories which both team members rated as failed to follow

instructions to incorporate a particular characteristic were eliminated from further consideration.

For each *Bonne’s Best* or *Splendor* story, the two team members also indicated how clearly the protagonists were happy or unhappy in that job as follows—“clearly unhappy,” “more unhappy than happy,” “more happy than unhappy,” or “clearly happy.” Only stories that both team members agreed were “clearly happy” or “clearly unhappy” were kept. The filtering process left at most 13 stories in each of our four desired categories (see Table 6.1).

Table 6.1. Four Categories of Stories and Numbers Of Stories After Phase 1 Filtering

Job	Clearly happy	Clearly unhappy
Bonnie’s Best	Bin 1: 8	Bin 2: 13
Splendor	Bin 3: 10	Bin 4: 0

For the category that ended up with more than 10 acceptable stories, in phase 2 we randomly selected 10 of those stories to move on to the story vetting phase 2. Unfortunately, none of the stories in the unhappy *Splendor* category passed muster. (See section 6.5.1 for a discussion of why this may have occurred.) Thus for that category, we skipped phase 2 and constructed stories for that category ourselves in phase 3 (see section 6.1.4 below).

6.1.2 Phase 1 filtering observations

Though we did not perform quantitative analyses on the filtering phase, there were several qualitative observations about the stories deciders wrote in Study 1 that struck us and are worth mentioning.

First, despite being told to write about themselves, many deciders’ stories had unsympathetic or even cartoonish protagonists. Many protagonists appeared irrational, antisocial, lazy, and/or crude. One story for instance, stated that the protagonist

graduated from Michigan State University and that it was “the biggest mistake of my life” (Michigan State University is a major rival of the University of Michigan, where we obtained most of our participants). It then went on to describe the protagonist as a “loser” from a “deformed family [with a mother of] the same description,” and “fat and ugly.”

People say I am a bitch but I just don't care what they think....My greatest obstacle is myself. And I usually do nothing about it but eat alone and eat a lot....Sometimes a whole bucket of chicken is better than the best sex or crack cocaine that money can buy. And since I don't get the former ever because of my herpes and the latter is too expensive, KFC will have to do.

A second observation was that many deciders wrote in outlandish plotlines or endings, despite being told to make their stories realistic. For instance: “I tried to look for a girl friend [*sic*] at the bars and even in a church that I started to attend but no luck. One day at work in the afternoon, I just went to the men's bathroom and shot myself.” These two observations suggest that people really do tend to think of narratives as forms of entertainment. Despite instructions to write about themselves and with realism, they often opted to make their protagonists interesting more than admirable, and their stories outlandish and dramatic more than realistic.

A third observation was that many stories would be unhappy, showing the protagonist to be miserable in the Bonnie's Best/Splendor job, only to suddenly morph into a happy ending when a new, better job magically appears and the person quits the original job we assigned them. We had asked deciders to include some conflicts and conflict resolution in the story. We had expected them to engage in option repairs—that is, view the downsides of their assigned jobs as conflicts, and to figure out ways to ameliorate those downsides. Instead, most people viewed the “conflict” as having taken a bad option, and the “resolution” to be merely to wait or keep looking for a better situation to come along and then abandon the first situation. Instead of finding ways to deal with downsides of an option, people ran away from them and assumed that a better option will come along. They seemed not to have considered the possibility that new options might have just as many or even more downsides of their own.

This observation taught us two things. First, in our story selection process, we needed to distinguish between happiness of the story overall and happiness with the Bonnie’s Best or Splendor job in particular. A story may have a happy ending, but what we were really interested in was how happy or unhappy the person was with the Bonnie’s Best or Splendor job itself, not with some other job that the person switched to at the end of the story.

Second, we observed that most people did not engage in either option repairs or coherence shifting in their stories. When forced to take an option that has downsides, most people’s natural response was not to address those downsides, but merely to bear with them until a better option came along. Instead of proactively solving problems and improving their current situation, most people either sought other options or waited and hoped for some magical *deus ex machina* to appear. Our research, therefore, would have much practical significance, if we can teach people the notion of option repair and they end up adopting it.

6.1.3 Phase 2—story assessment panel

In phase 2, for each category (except the last one, which had no stories) we hired 20 panelists to read and evaluate each of the remaining 8-10 stories in that category on their *job persuasiveness*—how good the stories are in persuading readers that the protagonist definitely should or should not take the Splendor or Bonnie’s Best job described in the story.

6.1.3.1 Panelist recruitment and assignment

Paid panelists were recruited via flyers and emails to the University of Michigan’s psychology paid subject pool and sociology, English, communication studies, comparative literature, political science, and philosophy departments. The announcements stated that hired panelists would “read and evaluate short stories on their quality and persuasiveness,” and that the ideal panelist “would enjoy reading and writing feedback on stories.”

For each category, each of the stories left in that category after phase 3 was randomly assigned, without replacement, to be processed by 10 panelists. Each panelist

essentially “specialized” in reading stories from a single one of our four categories. To prevent fatigue, each of the 20 panelists in that category assessed only 4 or 5 stories at a time.

6.1.3.2 Panelist materials and procedure

At the beginning of the panel, each panelist received, in paper-and-pencil format, a page of general instructions and five separate packets. Each packet consisted of a story to be assessed and 18 questions to answer for the story assessment. Each of the questions had a comments section that allowed panelists to write in their justifications of their assessments. See Appendix C for the actual general instructions and questions. The packets were randomized so that the presentation order of the stories was random.

The general instructions explained the purpose of the planned Study 2 and told the participants that they were to assess stories on general quality as stories, job persuasiveness, and realism, and not on mechanical errors or writing skills. The participants were told that, despite them being asked to give absolute ratings of the stories, the process was to be holistic and so they were encouraged to compare and contrast the stories, and to modify their responses to previous questions as needed to reflect their increasing experience with the task.

The packets of questions requested (a) an immediate overall assessment of the story’s job persuasiveness; (b) assessment of the story on specific aspects; (c) any other factors the panelist thinks are relevant to job persuasiveness and her assessments of the story on those factors; and (d) a final overall assessment of job persuasiveness, taking all the previous responses into account. The questions about specific aspects of stories elicited the extent to which the story included the following

- sequence of events
- protagonist background
- supporting characters
- actions to achieve goals
- causality
- specificity, concreteness, and vividness

- emotionality and perspective-taking
- conflict and conflict resolution
- realism
- coherence
- ending valence (happy or unhappy) and clarity (how clearly happy/unhappy)
- job argument valence (favor or disfavor the job) and strength (of argument for/against the job)
- mnemonic title (title recalls the story contents)
- thematic title (title conveys the key theme/lesson of the story)
- compelling and engaging title

These questions and their wording were either taken from or inspired by Escalas's (2004) Narrative Structure Thought-Coding Scale. Escalas's scale asked only about actions and goals, emotions and perspective-taking, transformation, causality, sequence, and specificity and concreteness. We added questions about the other aspects of stories that were discussed in section 3.2. The amount of time to read the general instructions and process five stories from scratch typically took panelists between 45 minutes to an-hour-and-40 minutes.

6.1.3.3 Panel analyses

The ending valence and ending clarity assessments were multiplied, to yield a single ending happiness/unhappiness variable. The job argument valence and strength assessments were combined in the same way into a single job persuasiveness variable. The three title assessments were averaged to yield a single title quality variable. We also tested story length as an additional predictor, in case people tend to be easily impressed by stories that seem on the surface like a lot of effort had been put into them. All of the variables for the specific questions, with the exception of job persuasiveness and story length, were averaged to yield a combined story quality variable.

We had asked panelists to note their initial overall assessment of the stories, just in case there were other factors relating to job persuasiveness that we had not thought of.

We wanted them to note their initial impressions of the stories *before* they read and could be influenced by our own questions addressing what *we* thought would be job-persuasive. As it turned out, final overall assessments were highly significantly predicted by initial overall assessments assessment ($r = 0.50, p < 0.001$). Nor did the “any other factors” question yield any ideas from panelists that we had not already considered. This meant that we probably did not miss any major factors in determining job-persuasiveness, and that our questions did manage to cover the most pertinent factors. Henceforth, in the rest of the analyses, we used only the final overall assessment variable.

The final overall assessment, job persuasiveness, and story quality variables were to be used to rank order the stories for phase 3 story-pair construction (see section 6.1.4 below). In the meantime, we were curious as to which specific story aspects predicted job persuasiveness and final overall assessments. For both variables, we ran mixed-effects regression models (Faraway, 2005a) that took into account individual variations among panelists, by including the panelists as a random effect. We applied backward elimination to both regression models. Job persuasiveness was predicted by specificity/concreteness/vividness, emotionality/perspective-taking, conflict resolution, realism, and story ending.

Final overall assessment was predicted by only emotionality/perspective-taking, story ending, and specificity/concreteness/vividness. If we included job persuasiveness as a predictor in the final overall assessment model, however, only job persuasiveness and emotionality/perspective-taking were left. In other words, job persuasiveness could replace story ending and specificity/concreteness/vividness as predictors. The fact that job persuasiveness predicted final overall assessment was good news. It meant that panelists did pay attention to our instructions about the purpose of the panel; that is, when making their overall assessments, they focused more on how happy/unhappy the protagonists were with the Bonnie’s Best/Splendor jobs, and less on how happy/unhappy the stories turned out at the end.

6.1.4 Phase 3—Story pairs construction

Constructing our desired four decision-persuasion story pairs was a challenge because we needed pairs of stories that not only (a) strongly favored one job over the other, but (b) sounded like they were written by the same person, even though in truth the stories were written independently by different people. The stories written independently by different decider subjects often differed in gender, personality, and values. It would not do, for instance, to have the first story praise the friendly atmosphere at Bonnie's Best, only to have the second story praise the lack of socializing and distraction at Splendor.

For each category, we sorted the stories from the panel by final overall assessment, job argument strength, and story quality in descending order. We picked out the top three stories from each category and tried to match them up. To create two versions of the choosing-Splendor scenario, we found stories from Bin 3 ("happy Splendor") and that matched ones from Bin 2 ("unhappy Bonnie's Best") relatively well.

Since phase 1 did not yield any stories in Bin 4 ("unhappy Splendor"), we could not simply find stories from Study 1 to match the top stories from Bin 1 ("happy Bonnie's Best"). Instead, we asked a male alumnus to complete the Study 1 story-writing task about the Splendor job; the only difference from a regular decider subject was that we asked this alumnus to make his story as persuasive as he could against Splendor. That story happened to more or less match one of the top Bin 1 stories. Those two stories then became our third needed story pair. The fourth story pair was created by taking another top story in Bin 1 and rewriting the alumnus's story to match it in gender and other characteristics.

6.2 Tradeoff Matrix Construction

To keep the contest between decision persuasion approaches fair, we constructed tradeoff matrices to correspond to the pairs of stories to be used in the story condition. For each of the four pairs of stories constructed as described in section 6.1 above, we created decision matrices and filled in feature ratings and dimension importance weights

as roughly indicated by the stories. Since the stories only gave a general sense of the degree to which the authors found the job features desirable or undesirable and the dimensions important or unimportant, we employed simpler rating and weighting scales than is usual for decision matrices. We employed a range of -2 (highly undesirable) to 2 (highly desirable) for the feature ratings, and a range of 1 (least important) to 7 (most important) for the dimension weights (see e.g., Figure 6.1). Even with these low-magnitude scales, the differences between the aggregated scores for the matrices for the two jobs were strikingly large (they ranged between 18 and 65). This suggests that our constructed story pairs really do tend to strongly favor one job over the other (as we would hope for decision-persuasive stories).

My rank of the importance of this dimension relative to the other dimensions (7= most important)	Dimensions	Features I Heard/Learned About Bonnie's Best's	My rating of this Bonnie's Best feature	Features I Heard/Learned About Splendor	My rating of this Splendor feature
4	Location	Dull, sparsely-populated industrial area, with one mediocre cafeteria nearby	0	Located in fun part of town, next to a new mall; many cafes, clothing stores, and cinemas nearby	-1
6	Salary	\$40,800 per year (\$800 above the average salary of a person at your position)	2	\$39,400 per year (\$600 below the average salary of a person at your position)	-2
7	Commute	18-minute each way	2	40-minute each way	-2
1	Work atmosphere	Employees generally eat alone in their cubicles	0	Employees generally go out to lunch in groups, visiting new eateries regularly	0
3	Office	Cubicle in a noisy area	-1	Small, private office	0
5	Vacation package	2 weeks of vacation per year, plus fun retreat in San Diego	2	2 weeks of vacation per year	0
2	Rules	Not many rules, but enforcement is strict	2	Lots of rules, but enforcement seems pretty lax	1
Overall Scores:			37		-28

Figure 6.1. One of Four Decision Matrices Constructed for the Matrix Condition in Study 2.

6.3 Repair Filtering and Construction

For Study 2, we planned to test as our repair decision persuasion approaches the union of all reasonable option repairs suggested by Study 1 deciders, with the idea that “more is better.” Therefore, the repairs to be used in Study 2 would not differ across

scenarios. We planned to filter the repairs generated by Study 1 decider subjects and consolidate them, so that they could be presented to Study 2 participants as decision justifications. Recall that we define option repairs as “concrete and specific personal actions a decision maker can take to deal with, improve upon, or otherwise minimize the negative consequences of an option’s downsides.” We first took the responses generated by the deciders and eliminated statements that did not fit the definition of repair—e.g., were irrelevant, abstract or non-specific, actions to be taken by employers instead of the employees themselves, etc. Second, we sorted all of the repairs by option, option downside feature, and issue purportedly resolved by the repairs. Finally, we removed redundant repairs.

Thus, for each option, we essentially created unions of all the repairs generated by deciders, sorted by the option’s negative features and specific issue solved by those repairs. For instance, two of the concerns Study 1 participants had about “employees typically eat[ing] lunch alone in their cubicles” were boredom during lunch and social isolation. We listed the repairs “bring a book or magazines to entertain myself on my lunch hour” and “listen to music while I eat and enjoy the quiet time” under “ways to deal with any concerns I may have about **being bored**,” and listed the repairs “have weekly lunch meetings outside the office to help create a friendly, open feel” and “try to find someone and get to know them better” under “ways to deal with any concerns I may have about **social isolation**” like so:

- [Option] Splendor
 - [Feature] “employees typically eat lunch alone in their cubicles”
 - [Concern] “ways to deal with any concerns I may have about **boredom during lunch**”
 - [Repair] “bring a book or magazines to entertain myself on my lunch hour”
 - [Repair] “listen to music while I eat and enjoy the quiet time”
 - “ways to deal with any concerns I may have about **social isolation**”
 - [Repair] “have weekly lunch meetings outside the office to help create a friendly, open feel”
 - [Repair] “try to find someone and get to know them better”

6.4 “Decider” Sketches

In order to give the control condition a fair chance against its competitors in Study 2, we would need to present some personal information about the “deciders” for all conditions. This way, the control audience participants would have something to work with when evaluating their deciders’ “approach” and choices. To create the brief, autobiographical sketch for each of our four decision scenarios, we took and combined the protagonist backgrounds written by the authors of the stories in the four story pairs we constructed earlier—e.g.:

When I went off to college, I had done well in high school--in the 25th percentile of my class--and graduated with a GPA of 3.2. I went to an in-state public university and had a great time in college. I am an outgoing person who loves to meet new people and work in teams. I enjoy going out on weekends with friends from work and from college and we usually have a great time talking, dancing, and laughing. I grew up in the suburbs and went to college in a college town so wouldn't mind living in a big city for a change of pace. I also have a boyfriend that I live with.

6.5 Story Filtering and Assessment Discussion

Though the main purpose of the story assessment panel was to select the most job-persuasive stories for use in Study 2, the panelists’ comments and our own reading of the stories (recall section 6.1.2 above) gave us some additional ideas about prospective narratives and problem solving to explore in future research.

6.5.1 Lack of unhappy Splendor stories

Why was it difficult for us to find decent clearly unhappy Splendor stories from Study 1, but not so difficult to find decent unhappy Bonnie’s Best stories? In Study 1, we did not impose on deciders any requirement to make their stories happy or unhappy; it was completely their choice as to how much their protagonists ended up liking or disliking the jobs. We posit that something about Splendor’s downsides made them hard to envision and write good stories around. Notice that Splendor’s downsides tended to be numerical (salary, commute time, and the extent of the vacation package), whereas Bonnie’s Best’s downsides were more immediate and visceral (cubicle with noisiness, eating alone, dull industrial area, bad food).

These observations yielded a new proposition for future research: the use and usefulness of particular decision approaches depends not only upon the audience, but upon the modality of the option features to be communicated. It makes sense that visceral features are better appreciated in story form, whereas abstract features like money, time, and other numbers are better appreciated via side-by-side comparisons and mathematical formulae, such as those provided by compensatory decision approaches. Verifying this would contribute to our understanding of the conditions under which compensatory schemes versus narratives are or should be used by would-be decision makers and persuaders.

6.5.2 Unsympathetic protagonists

As discussed earlier, both we and even some of our story panelists noticed the unsympathetic natures of many protagonists in the stories. The Study 1 participants who wrote those first-person stories did not appear to care about self-presentation or impression management. As it turned out, this may have hurt those stories' persuasiveness. Panelists who noticed the unsympathetic natures of protagonists complained about those protagonists in their comments on the persuasiveness of the stories. It was as though being unsympathetic as a human being made the protagonist's conclusions within a story less persuasive to the reader. This observation is both interesting and disturbing, because a person's actual decision making competence should not depend upon his likeability. An implication for decision prescription is that impression management *is* important when justifying decisions, even when one's competence or likeability has nothing to do with which option is most suited for oneself. This implication is consistent with persuasion research showing that likability can affect a person's persuasiveness (McGuire, 1985).

Why did at least some of the participants not bother with self-presentation or impression management? For some of the participants, it could be that they did not follow our instructions and focused on making their stories entertaining and their protagonists fictional instead of true to themselves. For other participants, it could just be that they felt comfortable being honest about their foibles to the experimenter. After all,

the participants were not forewarned that their stories will be used in a decision task later on, or that their stories would be involved in a contest to see which ones were most job-persuasive.

6.5.3 Running away from options instead of repairing them

We noticed that, in general, story writers ended up giving themselves a happy ending, regardless of how happy or unhappy they actually were with the jobs. It was as though they felt they had to end their stories on positive notes. Interestingly, however, the happy endings did not result from them either changing their attitudes toward the job features or repairing the given jobs. Instead, the protagonists would switch to new, better jobs would suddenly materialize at the end of the stories. In other words, rather than taking personal action to improve their situations by solving problems with the current option, protagonists just waited for new, better options to appear. Such passivity is sad. If the stories were good representatives of how people act in real life, our observation suggested that many people experience life as being outside their control, which may either be true for them or a self-fulfilling prophecy. This also suggested that there are consistent personal characteristics that predict people's tendencies to make option repairs. Administering instruments like locus of control (Rotter, 1954) and self-efficacy (Bandura, 1977) would test this. On the upside, the observation highlights again the significance of our research, and the enormous opportunity for improving people's lots in life.

Inculcating a proactive attitude towards life and its obstacles is important not just for benefitting the self, but for decision justification and influence. Our story panelists also complained about passivity in protagonists, and gave the impression that they considered such characters to be "whiners." Panelists liked protagonists who were proactive and did not just accept their fates and downsides of the jobs. Audiences want "closure," in the words of one panelist, and they do not like protagonists who walk away from problems, leaving them unresolved. Thus, repairing options theoretically *should* aid decision persuasion. This disliking of "whiners" may explain an interesting finding of ours that the "unhappy" bin stories were rated worse overall than stories in either of the

‘happy Bonnie’s Best’, $t(185.7) = -2.56, p = 0.006$, and ‘happy Splendor,’ $t(203.5) = -1.96, p = 0.03$ bins. In contrast, there was no difference between the two happy bins in their overall assessment, $t(185) = 0.63, p = 0.53$.

Thus, even though the decision makers often neglected to include problem solving in their stories, the readers of the stories apparently expect them to. Perhaps people hold other decision makers to a higher standard than they do themselves. Alternatively, perhaps people hold protagonists in stories to a higher standard than they do humans in real life. Protagonists in stories are expected to be heroic and to conquer all odds. A good yarn does not have the hero run away with his tail between his legs. From a prescriptive point-of-view, our observations suggested that one way to inspire decision makers to make option repairs is to present the story metaphor to them and to ask them to think of themselves as heroes in a story, striving resourcefully to solve problems.

It could be that once people know their stories will be used for decision making, they would make the protagonists more true to themselves, admirable, and proactive. Our pilot study for Study 1 did forewarn participants about the decision task, but that still resulted in many unrealistic stories. Stronger motivation would likely be needed to induce realism—e.g. a real-life major decision. As for likability, knowing their stories will be used for justifying their decisions might induce people to make themselves more admirable in their stories. The ideal way to obtain story stimuli for Study 2 would be to frame the story-writing task as a competition, with a real prize to be sent to the winner in the future. The upside to our insight is that with proper motivation, people may be capable of writing more persuasive decision justification stories than was apparent from Study 1.

This observation of the advantage of forewarning participants of the purpose of the story-writing task also suggested that the story approaches in Study 1 were rated as no more helpful than the control approach was because participants did not know the story-writing’s purpose, and thus the stories turned out to be less relevant to the decision problem than they would have been otherwise.

To summarize what was done in between Studies 1 and 2, after selecting the most decision-persuasive stories generated in Study 1 using panelists, we constructed four story pairs, two supporting a choice of Bonnie's Best and two supporting a choice of Splendor. We crafted short fictional decider autobiographical sketches and decision matrices to correspond with the story pairs. We consolidated and organized the repairs generated from Study 1 as well. The sketches, matrices, sets of repairs, and story pairs were used to construct the materials for the five conditions used in Study 2, as described in section 7.2.1 below.

Chapter 7

Study 2--Decision Audiences

Whereas Study 1 focused on addressing our first, second, and third sets of empirical questions (as listed in section 4.6 above) about various decision approaches as decision aids, Study 2 focused on addressing the fourth set of questions about those approaches as other-oriented decision persuasion tools. One part of Study 1 compared and contrasted the effects of compensatory scheme, prospective repair, and prospective narrative decision approaches on decision makers' self-persuasion, implementation intention, and anticipated other-persuasion. Study 2 compared and contrasted the effects of those same approaches on actual persuasion of decision audience members.

As discussed previously in section 4.2.1, scholars from a wide range of fields have long asserted the persuasive power of narratives. Some have verified the usefulness of prospective narratives for other-oriented decision influence (e.g., Adaval & Wyer, 1998). We propose that prospective narratives and prospective repair/problem solving are useful for other-oriented decision justification as well. Even if it turns out that decision makers do not like or find useful the various decision approaches we tested, they may still want to leverage those decision tools to communicate their choices and persuade other people that the choices were good ones. There have been mixed evidence as to whether narratives or statics are more persuasive (Reynolds & Reynolds, 2002), so we wanted to see whether the prospective narratives and repair approaches would be more persuasive than the traditional compensatory scheme as well.

Finally, personal characteristics may once again mediate any differences found between the persuasion tools with respect to their influence on decision audiences. All the scales we used on decision makers in Study 1 could plausibly be applicable to

decision audience participants in Study 2 as well. Justifying a decision on the basis of matrices may work better for audience members who have high subjective numeracy, while prospective narratives may work better for audience members with high narrative transportability. Audience members who are high in actively open-minded thinking should prefer two-sided over one-sided persuasion strategies, since they are likely to think of counterarguments during a persuasion attempt. Personal characteristics of their audience would be useful for decision makers to know. They may want to choose one approach for making decisions, but switch to another approach when justifying those decisions, especially to people that differ from themselves (cf Lerner & Tetlock, 1999). One may even want to combine multiple persuasion strategies when the audience is diverse.

As a reminder, here are the specific empirical questions again:

Q1: Prescription (Other-Persuasion)—Would justifying decisions on the basis of matrices, repairs, or narratives serve other-persuasion purposes?

Q1a: Which form(s) of presenting decision explanations are (more) effective for other-oriented justification purposes—matrices, prospective repairs, or prospective narratives?

Q1b: Are differences in effectiveness for the approaches mediated by certain traits of the audiences?

Q1c: Is it better to be one-sided or two-sided when repairing/storying options for decision self-persuasion, implementation intention, and anticipated other-persuasion purposes? Are there personal characteristics in this?

As measures of other-persuasion, we planned to test the effects of five decision justification conditions on audience participants' predicted utility of deciders' choices for the deciders, perceived competence of the deciders as decision makers, and their own choices between the options offered to the deciders.

7.1 Five Justification Conditions

For this between-subjects design, the five decision justification conditions we used were control, tradeoff matrix, one-sided option repair, two-sided option repair, and story pair. The decision matrices, repairs, and story pairs were constructed as described in Chapter 6 above. After trying out various versions of the experiment materials on pilot subjects, our finalized control condition had the fictional deciders state that they discussed their thoughts with someone who is impartial and can evaluate the option objectively. (This enabled the scenario to have the control deciders spend the same amount of time on their process as deciders in other condition did, yet not give audience participants specific details on the decision reasoning.)

Recall that Q4c asked whether one-sided or two-sided repairs and stories work better on audience members. Given the limited number of good stories we had to work with, we had to forgo controlling how one-sided or two-sided the stories we used in this study were. Therefore, we did not address the one-sided/two-sided question for the story approach. But we were able to include separate one-sided and two-sided repair conditions to address the question for the repair approach.

7.2 Materials and Procedure

One hundred sixty-one unpaid and paid participants were recruited for this experiment. Thirty undergraduate students participated for course credit, while 131 people were recruited via a psychology paid subject pool list, campus flyers, a classified ad, and word-of-mouth.

For the between-subjects design, each audience participant was randomly assigned to review one of 20 sets of stimuli—4 “decider” scenarios x 5 conditions. After reading their decision scenarios, the audience participants evaluated the deciders and the job offers. They then completed the same Transportability, Subjective Numeracy, Actively Open-Minded Thinking, Need For Cognition, and demographics questionnaires from Study 1.

7.2.1 “Decider” scenarios

After reading and accepting the consent form, each audience participant was handed a paper packet containing the following: the general instructions and cover story, a character sketch and statement from their assigned “decider,” the job offers, the application of the decision approach depending upon the participant’s assigned condition (as described in Chapter 6 above), and the decider’s final conclusion.

The cover story entailed a friend who is having trouble deciding between two job offers, and therefore has applied a decision making procedure s/he had heard of in order to “break the tie.” This procedure is, of course, the decision making approach corresponding to the particular condition. See, for instance, this excerpt from the control condition:

Your key task in this study is to evaluate someone’s personal decision.

Imagine that your close friend (who will be role-played by another participant) has been looking for a job. Your friend has received interesting job offers from two large companies, Bonnie's Best and Splendor. The two companies are similar in terms of their size, reputation, stability, and prospects for promotion. Your friend has spent a couple of days interviewing at each of the companies' offices and talking to employees there. Your friend needs to decide which of the two offers to accept; that is--which of the two jobs is a better fit for him- or herself.

Unfortunately, each company and job offer has both pros and cons relative to the other company and offer. After thinking about the decision problem for a while, your friend still had trouble deciding between the two jobs.

Sometimes when making a difficult and important decision, it helps to discuss one’s thoughts about the options with another person who is impartial and can evaluate the options objectively.

Your friend heard this advice somewhere and used this advised procedure to break the tie between the two job offers.

You naturally care about your friend's future and whether the decision was an appropriate one for him or her. You therefore asked your friend to tell you about the jobs and his/her decision. You plan to use this information to evaluate whether the decision was a good one or not.

The audience participant was then given an outline previewing the rest of the packet. Only the underlined portion differed across conditions. It was replaced by a short description of the decision making approach appropriate to the participant's assigned condition.

The audience participant then received the short sketch of the decider (as described in section 6.4 above), a paragraph from the decider "friend" explaining his or her situation, difficulty with the decision, and hence intent to try out the decision procedure described earlier. The two job offers followed.

For control participants, the above character sketches were all they were given to try to evaluate whether the job offers were good matches for their "friend" or not. (In a pilot study where we did not include character sketches, the control participants were confused and frustrated—understandably so in hindsight.) For the rest of the participants, the job offers were accompanied by the decision matrix, option(s) repairs, or story pair appropriate to the assigned condition. To recap (see the details in Chapter 6 above):

- Control condition—the two jobs, one after the other without any further comment.
- Matrix condition—the traditional decision matrix which lists the jobs' details, -2 to 2 rating of each feature, importance rankings from 1 to 7 (with 7 indicating "most important"), and computed aggregate score for each job.
- Story condition —the chosen job, followed by a happy story about that job, then the rejected job, followed by an unhappy story for that job.
- Two-sided repair condition—for each option, for each downside, the union of all the repairs Study 1 deciders generated, sorted by the issue that the repairs purport to ameliorate.
- One-sided repair condition—identical to the two-sided repair condition, save that no repairs are presented for the rejected option. Instead, for the rejected option, the material merely stated that the decider was unable to think of feasible repairs for the downsides of the option.

Finally, the one-paragraph conclusion announced the “decider’s” final choice—e.g., “I am thinking of choosing Splendor over Bonnie’s Best”—and justified it by referring to the decision procedure s/he applied earlier. As an illustration, suppose the scenario’s “decider” ended up choosing Splendor over Bonnie’s Best. In the:

- Control condition—“After spending 20 minutes discussing my thoughts about the jobs with one of my favorite GSIs, I concluded that I would prefer Splendor to Bonnie’s Best.”
- Matrix condition—“After spending 20 minutes creating this table and applying the numerical scheme to weigh the pros and cons of each job, I found that my overall score for Splendor exceeded the score for Bonnie’s Best, and concluded that the arguments for Splendor outweigh the arguments for Bonnie’s Best.”
- Story condition—“After spending 20 minutes creating stories of what my life might be like if I took each of the two job offers, I concluded that I would be happier at Splendor, and unhappier at Bonnie’s Best.”
- Two-sided repair condition—“ After spending 20 minutes trying to think of concrete, specific actions I can to deal with the downsides of the two job offers, I concluded that, although I was able to think of actions I can take for both jobs, dealing with Splendor’s downsides seems more realistic and feasible for me than dealing with Bonnie’s Best’s downsides. The downsides of Splendor appear to be more easily improved than those of Bonnie’s Best.”
- One-sided repair condition—identical to the two-sided repair condition, except with the underlined portion removed.

The materials for all conditions stated throughout that the “decider” employed the decision procedure for 20 minutes. This was to prevent the audience from making their own inferences about the amount of time and effort that the deciders spent making their choices. That way, any differences in dependent variables we observe between the conditions would not be due simply to the amount of time and effort perceived to be spent on the decision task.

7.2.2 Decision evaluation

For our dependent variables, we were interested in measuring three constructs associated with decision audiences—their prediction of the choice’s utility for the deciders, the competence of the deciders and their decisions, and their own opinions of the options (to see the extent to which the audience participants were influenced by their deciders’ justifications). First, audience participants reported how happy they thought their deciders would be in the chosen job (-5 = *highly unhappy*, +5 = *highly happy*). Second, they were told to express how the deciders came across as decision makers in general and asked to report:

1. to what degree the deciders seemed to be good decision makers (-5 = *worst possible*, +5 = *best possible*);
2. the wisdom of the decisions (-5 = *highly unwise*, +5 = *highly wise*);

Finally, we told audience participants that we were interested in how their own opinions about the jobs had been affected by the deciders’ decision processes. They then rated:

1. which of the two job offers was superior to the other, in general (-5 = *Bonnie’s Best is definitely superior to Splendor*, +5 = *Splendor is definitely superior to Bonnie’s Best*);
2. which company it would be better to work for (-5 = *definitely Bonnie’s Best*, +5 = *definitely Splendor*);
3. which of the two job offers they would take themselves, and to what degree (1 = *slightly*, 5 = *definitely*)

Textboxes after each of the three sets of questions encouraged audience participants to elaborate on their responses.

7.2.3 Effects of deciders’ approaches on audience participants’ own decision processes

We discovered an unexpected benefit of presenting decision approaches to audience in the manner we did. Many audience participants across all the conditions noted that they found the materials and approaches innovative and interesting. In fact,

they planned to employ those approaches in their own decision making in the future! This raised the idea that illustrating the use of specific decision approaches to people can be an efficient way to convey the approaches to them for their own use. From a prescription perspective, our experiment materials may have an alternative use as decision making teaching tools.

To see which approaches were indeed commonly emulated by audience participants, we added questions to the debriefing forms asking audience participants to check off which decision approaches their assigned “deciders” used and which ones they themselves used when asked to make their own choices between the job offers. These variables were examined in the analyses below as well.

7.3 Quantitative Analyses and Results

7.3.1 Three decision evaluation dependent variables

As a reminder, we were interested in the effects of various decision approaches on audiences to those approaches. Specifically, we were interested in their usefulness for decision justification, impression management, and decision influence. We measured these by asking audience participants in the “Evaluation” phase about the “deciders” choice utility, competence as decision makers, and their agreement with the “deciders” choices, respectively.

The two decider competence questions were combined into a single *decider competence* dependent variable, Cronbach’s $\alpha = 0.89$. For each of the last three “Evaluation” questions, we took the responses to those questions and multiplied them by 1 if they favored the deciders’ chosen job, by -1 if they favored the deciders’ rejected job. This resulted in corresponding variables that captured the degree of agreement between the audience participants’ own preferences and their deciders’ choices. These three variables were combined to form a single audience-decider *choice agreement* dependent variable, Cronbach’s $\alpha = 0.92$. The final three dependent variables are listed in Table 7.1.

7.3.2 Tested models

We performed the same procedure to transform variables and analyze the effects of the decision approaches on the dependent variables as we did in Study 1 (described in section 5.2 above). The dependent variables and scales were obtained from decision audience members rather than decision makers.

There were two additional differences between the two studies' models that we should note. First, we were unable to include a processing time control variable in this experiment like we did in Study 1. This was because the audience participants had to wait to receive the decision scenarios in hardcopy form from the experimenter before beginning to review the information. The experiment software was therefore unable to record the amount of time it took audience participants to process the approaches. Telling the audience participants across all the conditions that the deciders took 20 minutes applying their decision procedure was an attempt to reduce differences between conditions due to a heuristic that more time and effort spent on a decision process leads to better decisions. Second, the scenarios in this experiment already had the chosen options be picked based on the approach applications (i.e., the fictional "deciders" chose Splendor/Bonnie's Best because the matrices, repairs, or stories they produced supported that option). Consequently, the dummy variables for the four treatment approaches already represented approach-choice agreement. Therefore, separate approach-choice agreement terms were not needed.

For the above reasons, the sidedness independent variable and the models we tested were either the same or simpler in Study 2 than in Study 1:

sidedness = (dummy_{matrix} + dummy_{two-sided repair} + dummy_{story}), where

- 1 = two-sided (matrix, two-sided repair, or story condition)
- 0 = one-sided (one-sided repair condition)
- NA = unknown (control condition)

dependent variable ~ (dummy_{matrix} + dummy_{one-sided repair} + dummy_{two-sided repair} + dummy_{story})

dependent variable_{audience} ~ Subjective Numeracy_{audience} × dummy_{matrix}

dependent variable_{audience} ~ Narrative Transportability_{audience} × dummy_{story}

dependent variable_{audience} ~ AOT_{audience} × sidedness

7.3.3 Effects on audience participants' opinions of the deciders and jobs

The resultant models are displayed in Table 7.1. The main effects of the conditions on the three dependent variables are plotted in Figure 7.1.

We first dispense with the one-sided repair approach. As expected based upon audience participants' comments, the one-sided option repair approach was not at all effective compared to the control approach. If anything, it fared worse. Indeed, the sidedness independent variable had a positive main effect, indicating that the two-sided treatment approaches we tested—matrix, two-sided repair, and story—were significantly more influential than the one-sided approach. Given that (a) the one-sided repair approach has no advantage over the other approaches, this approach is too risky for us to promote as an effective one from a prescription viewpoint, even if it may describe people's actual tendency in real life. We therefore eliminated one-sided repair as a viable competitor for “best decision persuasion approach.”

Regarding the other approaches, the story approach was the only one that aided decision justification and other-oriented influence above and beyond what the control approach did. Only the story condition had significant (and positive) main effects on deciders' future happiness as predicted by audience participants and audience-decider choice agreement, relative to the control approach. As for decider impression management, two-sided repair was the winner. It was the only approach that had a significant impact on decider and decision competence as perceived by audience participants. The matrix approach had no significant effect on any of our dependent variables of interest. We found no other effects of personal characteristics on any of the dependent variables.

Table 7.1. Effects of Decision Approaches and Personal characteristics on Audiences (Relative to Control/Unelaborated Approach)

Variable	Decision	Impression	Decision
	justification	management	influence
	Predicted	Decider	Agreement
	happiness	competence	
	<i>B</i>	<i>B</i>	<i>B</i>
Main effects of approaches ^b			
Intercepts	-.33**	-.37***	-.66***
Approach			
Matrix	.15	.09	.17
Repair one-sided	-.14	-.17	-.001
Repair two-sided	.20	.36*	.20
Story	.33*	.23'	.54***
Personal characteristics effects ^c			
Intercepts	—	-.01	—
Subjective numeracy (SN)	—	-.01*	—
Matrix approach	—	-.61'	—
SN × Matrix approach	—	.03'	—
Intercepts	—	—	—
Narrative transportability (NT)	—	—	—
Story approach	—	—	—
NT × Story approach	—	—	—
Intercepts	-.47***	-.55***	-.66***
Actively open-minded thinking (AOT)	—	—	—
Sidedness ^a	.37**	.40***	.31*
AOT × Sidedness	—	—	—

Notes. *n* = 161 unless otherwise indicated. All dependent variables were log-transformed to make them more normal. The subjective numeracy independent variable was quadratic-transformed to make it more normal. For ease of reading, listed intercepts and non-significant terms are grayed out.

^a*n* = 129. ^bFull model is presented ^cBackward elimination was employed to eliminate non-significant terms (denoted by —).

'*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

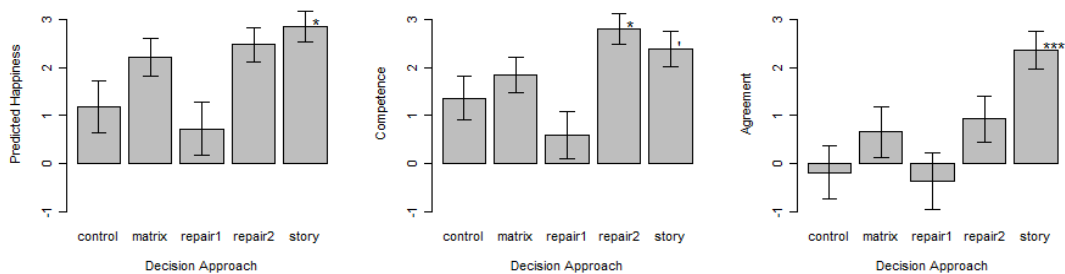


Figure 7.1. Effects of decision approach on Study 2 audience participants. Vertical lines depict standard errors of the means. Asterisks indicate the significance of the treatment approaches compared to the control approach. $p < .10$. $*p < .05$. $p < .01$. $***p < .001$.**

7.3.4 Effects of deciders’ approaches on audience participants’ own approaches

Since audience participants were allowed to check off more than one approach when reporting which approaches they used to make their own choices between Bonnie’s Best and Splendor, we created binary dummy variables representing the use of each approach. We ran binomial regression models of each of these dummy variables on the deciders’ approaches. The only models that turned out significant were those for the matrix and two-sided repair approaches.

As foreseen via audience comments, both one-sided and two-sided repair conditions led to the use of two-sided repairs by audience participants ($z = 2.15, p = 0.03$ and $z = 2.63, p = 0.009$, respectively). This was consistent with the audience participants’ comments, which indicated that (a) people tend to like the repair approach, yet (b) they do not like approaches that are too biased toward one option over another. It makes sense that people who are exposed to the one-sided repair approach would want to use repairs in their own decision making, except in a two-sided manner.

A more surprising result was that both repair conditions also resulted in lower use of the decision matrix approach ($z = -2.05, p = 0.04$ and $z = -2.31, p = 0.02$, respectively). This may have occurred because the repairs approach focused people’s attention on the

downsides of options to the exclusion of the upsides. Audience participants who saw the repairs approaches and emulated them might not have bothered to go a step further and weigh the pros as well. On the other hand, the opposite situation could have occurred. Seeing the repairs approach could have induced audience members to focus more on upsides than downsides of options, since downsides no longer appeared to be of any real concern. Regardless, we have discovered a possible disadvantage of an approach that solely uses option repairs.

7.4 Discussion

Study 2's goal was to address Other-Persuasion question Q4 by comparing and contrasting the effectiveness of various approaches for justifying decisions, managing other people's impressions of oneself as a decision maker, and influencing other people's decisions. We pitted four treatment approaches—the traditional decision matrix, one-sided option problem solving (“repair”), two-sided option repair, and prospective storytelling—and a control approach—consulting a third party—against one another and compared their effects on decision audience participants. The participants read scenarios in which a “decider” employed one of the five approaches to choose between two job offers. They then completed questionnaires about the scenarios, personal characteristics, and demographics. See Table 8.1 **Error! Reference source not found.** in the concluding chapter for a graphical summary of the studies' key results.

7.4.1 Effectiveness of the approaches

Q4: Other-Persuasion Effects—Would justifying decisions on the basis of matrices, repairs, or narratives serve other-persuasion purposes?

Q4a: Which form(s) of presenting decision explanations are (more) effective for other-oriented justification and influence purposes—matrices, prospective repairs, or prospective narratives?

Q4b: Are differences in effectiveness for the approaches mediated by certain personal characteristics of the audience members?

Q4c: Is it better to be one-sided or two-sided when repairing/storying options for other-oriented justification and influence purposes? Is this mediated by certain personal characteristics?

Unfortunately, we could not control the one-sidedness/two-sidedness of our stories, so we did not address the one-sided/two-sided Q4c for the story approach. As for conveying option repairs to audiences, “more” was not necessarily “better.” Both audience debriefing and quantitative analyses showed that the one-side repair approach failed miserably, at least for highly transportable audience participants. It was not due to the problem-solving part, but to the one-sidedness being too strong. Showing so many repairs for only one option but none for the other option came off as too biased to high transportability audience participants. Paring down the number of repairs presented may make a one-sided decision approach work better on audience members. In the future, we would try presenting a smaller subset of the repairs, so as not to make the one-sided approach seem too unbalanced.

Our finding implied a caveat for Klein’s (1996) finding that expert decision makers in time-critical situations, such as firefighters or military personnel, tend to satisfice. Only simulating options serially and selecting the first one that is deemed acceptable may be adaptive for making quick decisions, but the decisions may not stand up under later scrutiny by audience members who are given enough time to come up with counterarguments. For the rest of our discussion, we eliminate the one-sided repair approach as a viable competitor.

For the three dependent variables we were interested in, only storytelling and two-sided option repair demonstrated significant value over the control approach. Two-sided option repair was the only approach that significantly increased decider competence as rated by audience participants. As long as the approach was not obviously biased towards one option over the other (like the one-sided repair approach), demonstrating the ability to address problems did impress audience participants as a sign of decision competence and wisdom. This was consistent with story panelists’ comments (as discussed in section 6.5.3 above) indicating a dislike of people who run away from

problems instead of addressing them. Therefore, problem solving is useful for impression management purposes as we hypothesized.

We also confirmed that narrative persuasion is effective—and, apparently, *regardless* of audience transportability when in a decision context. Storytelling was the only approach that significantly aided decision justification and influenced audiences' own preferences between the jobs. So the lawyers were on the mark. Narrative persuasion scholars should be pleased. Surprisingly, the two-sided repair approach did not have the same effects; one would have thought that decision audiences would find suggested repairs useful for their own decision making. Apparently, stories were the only mediums that audience participants found compelling. Audience comments about the weaknesses of the other approaches suggest that this might have been because decision matrices did not provide elaborated explanations of the deciders' thoughts, while option repairs only focus on option downsides while neglecting to address option upsides.

Two-sided repair turned out to have an additional advantage over the other approaches that we had not anticipated—it inspires emulation by people. Without any prompting on our part, audience participants who saw either of the option repair approaches later self-reported as having used two-sided option repairs when they made their own choices between the job offers. This was wonderful news from a approach-teaching standpoint. Unfortunately, we do not know whether it was the repair approach or just the repairs themselves that people found useful. We do not know whether people would be willing to emulate the approach from scratch, or would they merely use the option repairs that are already provided out of convenience. This would be a worthy future study.

Unfortunately, a downside of the repair approaches was that audience participants who saw those approaches later self-reported themselves as having used the decision matrix approach less than those who did not. It would be interesting from a theoretical perspective to find out in future studies whether it was because option repair approaches focused too much of their users' attention on the downsides of options at the expense of the upsides, or vice versa. From a practical perspective, however, one should not

recommend an option repair approach without also recommending an additional method to consider option upsides. One could recommend the matrix, for instance, to draw attention to all the features. Another possible recommendation is to repair and improve all features to the best of one's ability and feasibility, not just the negatively-valued features.

It is both ironic and disturbing that the approach touted by traditional decision theory, the compensatory decision matrix, did not live up to its promise. Although admired by subjects for its comprehensive weighing of pros and cons, as a whole it did not predict any of our dependent variables of interest.

7.4.2 Decision justification, impression management, and influence prescriptions

Our study yielded a number of suggestions for improving people's decision justification, impression management, and other-oriented influence. In order to justify one's decision or to entice others to choose a particular option, one should tell stories projecting what the future would be like should they choose the options at hand. One should tell a story projecting a happy future with one's preferred option, followed by stories projecting unhappy futures with the other options. Politicians and pundits do this all the time. During 2011, for instance, President Barack Obama argued that stimulus bills would increase employment (and hence, lead to a better future for the nation), while failing to increase the debt ceiling would lead to economic failure and dire consequences for the nation—all while Republicans argued the opposite. To make oneself look like a competent decision maker to other people, one should discuss options repairs—that is, steps one can take to address options' downsides, as suggested by SWOT analysis.

We did discover that people can be taught to use option repair by modeling. Simply exposing them to our fictional deciders' approaches inspired many audience participants to emulate those approaches or plan to use them in their own lives. It would be an interesting study to see whether people would be willing to spend time generating additional repairs of their own, or merely ride on the coattails of others' ideas.

The ease of teaching the option repair approach has a dark side as well, however. The option repair approach instructs people on how to process only the downsides of options, not the upsides. Some audience participants noted this in their comments on deciders who used the repair approaches. In addition, we found that audience participants who saw repair approaches were more likely to self-report themselves as using the repairs approach later on when making their own decisions, and less likely to self-report themselves as weighing pro and cons. Future work could check whether this decreased usage of pros-and-cons weighing is attributable to a lower focus on pros, a lower focus on cons, or both. It could be that all the talk about cons led audience to focus on those at the exclusion of pros. On the other hand, the option repair approach could have imparted the lesson that cons are of no real concern, and therefore only pros are worth comparing when choosing between options. Therefore, the repair approach should always be accompanied by another approach that addresses the upsides of options as well as the downsides. As discussed in the previous section, one could first use the matrix approach to ensure that all features and dimensions are considered, then strengthen every feature to the highest extent possible, before choosing among the resultant reconstructed, strengthened options.

Although stories were shown to have positive benefits in front of decision audience members, there is still a practical obstacle to us recommending that approach for decision justification, impression management, or influence. Study 2 was about pitting the “best against the best.” We did this for internal validity reasons—so that we know whether or not good stories are better than good repairs or good tradeoff matrices. But some external validity was sacrificed. Even if good stories are persuasive or whatever, there is no guarantee that every person can be trained to write good stories. Of the 90 stories written by participants in Study 1, only one-third of them passed initial muster as decent and realistic stories. See section 0 for further discussion on this issue.

Chapter 8

General Discussion

This work proposed prospective option repairs and stories as possible competitors or complements to the traditionally studied decision matrices for addressing description, explanation, and prescription questions associated with multi-attribute decision processes and spreading of alternatives phenomena. We reviewed reasons why the approaches should appeal to decision makers, their usefulness for resolving cardinal decision issues, decision self- and other-persuasion, and decision implementation. Our studies focused on the persuasion and implementation aspects in particular, as well as the approaches' prevalence, process cost in time and process benefit—i.e., deciders' enjoyment and perceived helpfulness of the approaches. In order to achieve these aims, we pitted the three types of approaches against spontaneous/unknown approaches of deciders on a two-option decision task. The repair and story approaches were additionally subdivided into one-sided (repair/story only one option) and two-sided (repair/story both options) variants. From decider participants, we obtained the following:

- a) approach prevalence based on decider self-reports
- b) approach completion time
- c) self-reported decision self-persuasion, implementation intention
- d) self-reported process enjoyment, helpfulness, and generation of new ideas

From decision audience participants, we obtained the following:

- a) decision justification reactions
- b) perceived decider competence as decision makers
- c) audience members' own opinions of the options

We also tested for mediation of the effects of the matrix and story approaches by subjective numeracy and narrative transportability, respectively, as well as the effects of the two-sided versus the one-sided approach variants by actively open-minded thinking.

8.1 Approaches' Prevalence and Performance Levels

We organize the results from both Studies 1 and 2 in Table 8.1 by broad empirical question and type of approach. The Studies 1 and 2 discussion sections already walked through and addressed the results in terms of the broad and specific empirical questions. In this section, we review the results in the order of the three major types of decision approaches we pitted against one another.

Table 8.1. Summary of Studies’ Results—How Approaches Fared Against Control Approaches With Respect To Broad Empirical Questions

Study	Empirical question	Dependent variable	Type of Approach					
			Matrix		Repair		Story	One-sided or Two-sided?
Study 1— Decision Makers’ Responses	Q1 Prevalence	Percentage spontaneously used approach	97% ^a		~70% ^a		~80%;	One-sided
	Q2 Self-Persuasion and Implementation Effects	Self-persuasion	For high SN deciders		Worse if repaired only BB		Better (if two-sided)	
		Anticipated persuasion	—		—		For NT deciders	
		Implementation intention	—		Better (if two-sided)		—	
		Realism	SAME		SAME		SAME	—
	Q3 Process Costs and Benefits	Completion time	Longer	<<	Even longer	<<	Longest	—
		Enjoyment	Worse	—	Worse	>>	Worse	—
		New ideas	—		Better		—	—
		Helpfulness	—		Worse if repaired only BB		—	—
		Adopted	—		By deciders and By audiences		—	—
Study 2— Decision Audience’s Responses	Q4 Other-Persuasion Effects	Justification	—		—		Better	Two-sided
		Impression management	—		Better (if two-sided)		—	Two-sided
		Influence	—		—		Better	Two-sided

Notes. Except for Q1 and realism, cells indicate whether the approach was significantly better or worse than the control approach. The last column indicated whether two-sidedness in repair/storying had greater positive impact than one-sidedness on the dependent variable at hand. >> and << indicated whether the approach to the left was significantly greater or lesser, respectively, than the approach to the right. The best-performing and worst-performing approaches in each row is highlighted in green and blue, respectively. — Tested, but no significant effect found. “SN” = subjective numeracy. “NT” = narrative transportability.

^aDid not check for mediation by personal characteristics.

8.1.1 Prospective storytelling

Prospective storytelling, along with two-sided option repair, had the most number of benefits. It aided all decision persuasion-related aspects we tested—self-persuasion, anticipated other-persuasion, justification, and even influence on others’ own decisions

between the options. This finding was consistent with lawyers' lay theories that narratives are persuasive, and helps expand narrative persuasion research into the decision arena. It even went beyond what narrative persuasion research would have predicted, as the effects hold regardless of individuals' narrative transportability, with the exception of anticipated other-persuasion.

The higher number of benefits of the story approach did come at the expense of longer completion time, higher difficulty, and lack of enjoyment by deciders when generating stories. Yet most deciders in the non-story conditions self-reported themselves as having used the story approach. There are two possible explanations for this. It could be that people realize that the extra time and effort to make stories are worthwhile in order to obtain the benefits. There are certainly many decision tasks that are minor and not worth spending the effort creating stories and repairs for (e.g., which toothpaste to buy). Thus we only recommend it for difficult and/or vital decisions.

It could also be that they engage in some simpler form of storying than the ones we tested. Perhaps people only engage in much simpler mental simulations of the future. It is plausible that they do not bother with all of the elements that make up good stories—e.g., characters, dialogues, and problems to solve. See section 8.5 below for a further discussion of these issues and ways to address this issue.

8.1.2 Prospective option repair

The (two-sided) option repair approach dominated the other approaches in many ways. It was the one most novel to people (few decider participants self-reported using it spontaneously) and seems likely to have the most immediate positive impact. Fewer people spontaneously used the approach compared to the matrix and story approaches. It had as many benefits as stories while taking less time to complete. Nor did its benefits duplicate those of the story approach. The positive effect of option repair on decision implementation intentions we found was consistent with findings from action planning and implementation research. The positive effect on perceived decider competence, along with story panelists' comments, supported the notion that anticipating problems and planning ways to solve them is an attribute admired by audiences. We therefore

recommend the option repair approach to deciders who wish to increase their likelihood of implementing their chosen options and want to look good as decision makers to other people.

Our studies indicated that people are indeed receptive to the option repair approach. Analyses of self-reports showed that (a) it induced decider participants to think of ideas they would not have otherwise and (b) it was emulated by audience participants who saw it being used by fictional deciders. An interesting future study would test whether seeing some sample option repairs would prime people to generate additional repairs of their own, or merely use the same repairs on their own decision making. Another variant on the study would test whether even seeing sample options repairs for one decision domain (e.g., initiating monthly group lunches in order to reduce social isolation in a new job) would inspire people to generate fresh repairs in a different domain (e.g., initiating monthly barbeques in order to reduce social isolation in a new house and neighborhood). Such analogical problem solving has been demonstrated in cognitive problem solving tasks (Gick & Holyoak, 1980, 1983).

8.1.3 Decision matrices

Ironically, the approach espoused by past decision scholars turned out to have the fewest of the persuasion and implementation benefits for which we tested, and those only for high subjective numeracy deciders. The matrix approach positively affected decision self-persuasion, but only for people who prefer numbers to words, as elicited by the subjective numeracy scale. Some decider and audience participants noted that decision matrices were unconvincing because they did not encourage/demonstrate deep thinking/elaboration about the decision problem. It makes sense that people who tend to prefer words to numbers (i.e., are low in subjective numeracy) would care about this issue. The mediating effect of the subjective numeracy scale helps to explain why past research found mixed evidence for whether narratives or numbers were more effective as persuasion tools.

One could also argue that people already weigh pros and cons as a part of their natural decision making, according to Study 1 self-reports, which is why the matrix

treatment group did not show significant difference from the control group. Instructing that group to consider pro and cons formally using numbers did not make the process any more compelling in persuasion or implementation ways, except for the members who like numbers. This explanation, however, does not work for explaining the fact that the matrix condition did not show significant differences from the control condition for decision audience participants either. Therefore, prescription-wise, we can only recommend the decision matrix approach for making decisions, not for justifying or influencing them, and even then, only for people who like numbers.

Decision explanation-wise, we suspect that decision matrices do provide value to most people; however, it is the side-by-side organization and comparison of features that people value, not the numerical scoring scheme. This would reconcile our findings that (a) most decider participants self-reported themselves as having weighed pros and cons in their decision processes and (b) those who were instructed to use the decision matrix approach did not receive more persuasion and implementation benefits from it than those instructed to use whatever approaches they wished to use. Many matrix decider participants commented that they find the side-by-side comparison useful. Even Ben Franklin proposed a simple method for weighing pros and cons that he himself used to make difficult decisions (MacCrimmon, 1973), and it did not require computation

We hypothesize that side-by-side comparisons by themselves are sufficient to aid decision making, and do not require high subjective numeracy to be appreciated. In traditional decision theory and in our studies, the two are conflated. In order to test this properly, we suggest testing side-by-side comparison of pros and cons as an approach *without* the use of numbers. We could introduce a time constraint to prevent control participants from making side-by-side comparisons. We would present the options in extremely length texts with many more dimensions and features to consider, so that it would take some time for people to compare the dimensions and features. We would give deciders and audience members only a limited amount of time to view the options, such that they would not have time to make side-by-side comparisons. The side-by-side comparison treatment group should then show significantly higher self-persuasion, implementation intention, and other-persuasion than the control group.

8.1.4 One-sidedness versus two-sidedness

We found that decision makers tend to be one-sided, even though it turned out that two-sidedness was better for implementation and other-persuasion purposes. Most of our decider participants who self-reported themselves as having used either repair or story approaches did so for their eventually chosen options; but only half did the same for the other option. Yet the one-sided repair justification approach in Study 2 was panned by audience participants for being too obviously biased. Perhaps people instinctively repair or story their favored options as a form of confirmatory hypothesis testing (described by Koehler, 1991) in which they elaborate and/or improve upon their favored options to make sure they are good enough and then stop the decision process. Our result is consistent with studies (Klein, 1996) showing that even professionals like firefighters and military satisfice when making decisions. Why do people satisfice (H. A. Simon, 1982)? Perhaps they do so to save time and effort. This makes sense for time-critical situations such as the ones firefighters and military officers face. Apparently, regular people prefer to take the quick and less effortful route to decision making as well.

Being one-sided may suffice in time-critical situations. First, it would not matter if two-sidedness is better for increasing implementation intentions, since any decisions made would be implemented immediately. Second, the self and an audience may not have time to ponder the decision and second-guess it. In non-emergency situations where the self and an audience does have time to ponder, however, one-sidedness backfires. Counterarguments would be more likely to be generated. Prescriptively, we would therefore recommend investing the additional time to do two-sided repairing/storying if one hopes to justify one's decision, impress others as a decision maker, or influence other people's decisions.

A possible future direction involves honing the one-sided repair approach to see if it can yet be effective for other-persuasion purposes. Perhaps a would-be persuader should bring up only a few selected repairs to present, so as to not appear too obviously biased toward one option over the others. Just like we did for the stories, we could hire panelists to vet all the repairs and select the most feasible and likely-to-be-successful

ones for presentation to audience participants. Combining the repair approach with other justification approaches may reduce any apparent bias towards favored options as well. Another future direction involves testing the one-sided and two-sided strategies against one another for long-term outcome benefits (see 8.6 below).

8.2 Decision Cardinal Issues and Answers to Broad Questions

Studies 1 and 2 enabled us to test whether or not various decision approaches aided the implementation and acceptability cardinal decision issues outlined by Yates (2003). As summarized in Table 8.2, of the three types of decision approaches we tested, only the (two-sided) option repair approach resulted in a marked improvement in implementation intentions over the control participants'. This was as we predicted based upon past research showing that making concrete and specific plans increases action implementation (for a review, see Gollwitzer, 1999). As for the acceptability issue, both option repair and story approaches helped convince audiences that the deciders who used those approaches would be happy with their choices, but the traditionally studied decision matrix approach did not have a significant effect.

Table 8.2. Whether or Not Decision Approaches Aided Resolution of the Implementation and Acceptability Cardinal Issues As Tested by Studies 1 and 2.

		Decision Tools		
Cardinal Issue	Study	Traditional Decision Matrix	Repairs (Problem Solving)	Narratives (beyond what mental simulation and repair already provide)
Implementation	1—Decision makers	No	Verified	No
Acceptability (Other-Oriented Justification)	2—Decision audiences	Proposed by Gardiner & Edwards (1975). No	No (save impression management)	Verified

To summarize, in response to the broad description question—how do people make multi-attribute decisions—we found out that the three approach types we tested—matrix, prospective option repair, and prospective storying—were all fairly prevalent among decision makers. Moreover, most people satisfice and only repair or story their eventually chosen options.

In response to the corresponding explanation question—why people make decisions in the way that they do, we found that compensatory schemes can be used by high subjective numeracy people in order to increase their confidence in their choices. Regardless of their subjective numeracy, most people like to weigh the features of the options against one another when making decisions, so decision matrices are helpful even when numerical compensatory calculations are not made. People may use prospective option repairs because those speak to the implementability of the chosen options, and thus increase implementation intentions. Repairs also help people look good to others when justifying their choices. People use prospective stories perhaps because such stories help them feel confident about their choices, as well as justify those choices to others. It makes sense that people would want to repair and story their candidate options before choosing them, in order to ensure that they will feel confident about their outcomes. As explained in Appendix A, any concerns decision makers may have about self-persuasion, implementation, and other-persuasion are by no means frivolous, as those often do impact long-term outcomes.

In regards to the broad prescription question—what recommendations can we make to improve decision making—we recommend the option repair approach for decision makers seeking to maximize their decision implementation and impression management, and the story approach for those who value self-persuasion or wish to justify their choices or influence those of audiences. In addition to the persuasion and implementation benefits mentioned above, prospective narratives are useful not just for justifying one's choice, but for influencing those of others as well—a principle well-understood by politicians. The matrix approach is also recommended for people interested in feeling confident about their choices, but the numerical portion of the approach is only recommended for people high in subjective numeracy. See section 8.4 below for an elaboration of our prescriptions.

Unfortunately, it turned out that option repair and story approaches do not take less time to complete than compensatory schemes. That means that neither of these approaches is the answer to the time-consuming problem with compensatory schemes as found by Means (Mean, 1983; Means et al., 1993). One must look elsewhere if one is in

need of some quick-and-easy decision procedures, e.g., gut reactions, heuristics, and non-compensatory rules.

8.3 Combining the Approaches

Our studies' findings support our notion in section 4.4 that the various decision approaches we studied can be complements to one another, not just opponents. Given that each approach has strengths and weaknesses that the other ones do not, no one approach is best for all situations. To hedge one's bets, the best decision approach that works for all situations may very well be to combine two, if not all three, of the approaches. Study 1 self-reports implied that many people intuit this. Half of our decider participants self-reported themselves as having used two or more of the three types of approaches. Combining multiple approaches was especially prevalent in high actively open-minded thinking individuals.

To further understand the motivations behind using multiple approaches, we could expand our experiments by pitting the four possible combinations against one another—decision matrix plus two-sided repair, decision matrix plus storytelling, storytelling plus two-sided repair, and finally, decision matrix plus storytelling plus two-sided repair. We could even try specifying the order in which the approaches are applied—e.g., decision matrix followed by repairing, followed by storying, followed by repairing again (in case storying leads people to think of even more repairs). The tradeoff matrix would provide an organized side-by-side comparison of the options' details and a seemingly logical algorithm. It would ensure that people addressed both the pros and cons of the options. In the meantime, the repairs and stories would be used to elaborate upon and verify the values assigned to option features. One-sided repair may yet be a viable contender if used to reinforce the conclusions of the other approaches. The decider would feel and appear organized, logical, resourceful, *and* thoughtful.

Given our finding that option repair and storytelling were the best two of the three treatment approaches we tested, we predict that the most effective combination would be either those two approaches or all three together. Since storytelling performed the best compared to the other approaches, we would recommend building the combined

approach around storytelling. After all, good stories in general are supposed to include conflicts and resourceful problem solving by the protagonist. We merely suggest that such problem conflict resolution should involve option repair—that is, discuss downsides of the chosen option and resolve them as part of the story about that option. We predict that adding a decision matrix would only have an effect for high subjective numeracy decision makers. However, having a non-numerical table that allows side-by-side comparisons should be useful to decision makers, even if only to help them figure out downsides that require repairing. Instead of creating a numerical decision matrix, it may be enough for storytellers to briefly weigh pros and cons of the options, state which option they choose, then launch into a story to illustrate the upsides and downsides and determine their values to decision beneficiaries.

The only downside to combining approaches is the amount of time and effort that they take, and it is unclear just how much patience decision makers and audience members have. This brings up another recommendation. Given how time-consuming they are, the approaches we studied are suitable for difficult, life-altering decisions, not for trivial ones. The practicality of this research is thus limited to the former situation.

Our Q1 analysis indicated that people, especially high actively open-minded thinking ones, realize the benefits of combining approaches. On average, deciders self-reported as having used two of our three treatment approaches.

8.4 Overall Prescriptions for Decision Makers and Persuaders

A rough procedure that could perhaps be recommended for decision makers based upon our findings and insights is as follows (assuming there are no differences between procedures in terms of long-term outcomes):

- (1) If wrestling with an important decision, it is worth spending extra time and effort on it—i.e., using more effortful approaches such as repairing or storying options.
- (2) Set up a decision matrix to allow side-by-side comparison of the options' features. Assign numerical feature values and dimension importance

weights if and only if you are high in subjective numeracy—that is, you tend to prefer numbers to words when considering ideas.

- (3) To maximize long-term outcomes, you should repair the options before comparing them. (The logic behind this was explained in section 4.2.1.) Repairing both repairs is recommended in order to maximize the likelihood of implementation and to make yourself look good to your audience. Review the generated repairs and eliminate any that seem unlikely or unrealistic.
- (4) Try the story approach for its self-persuasion (and justification, if needed) benefits. Incorporate the repairs you generated earlier into the story, i.e., conflict resolution episodes. Strive for realism with respect to yourself and real life, as opposed to entertainment.
- (5) Update your values and weights in the decision matrix from Step 1, if applicable and compute the overall scores for each option.
- (6) Select the option based on (a) which story had the happiest ending, and/or (b) which option had the highest overall score in the decision matrix.

Would-be decision influencers should definitely use the story approach in order to persuade other people to take particular options.

We note that even though the numerical portions of the matrix approach may not be useful to people low in subjective numeracy, the side-by-side comparison step should be done anyway, if only as a preliminary step to the option repair approach.

8.5 Story, Repair, and Decision Matrix Quality and Story Improvement

Another prescription concern for decision justification and influence purposes has to do with story, repair, and decision matrix quality. For internal validity reasons, we wanted in Study 2 to pit “the best against the best” of each approach. As it turned out, stories performed the best of the three types of approaches. But this was only after we used panelists to pick out the best stories written by deciders. In real life, storytelling may not be reliable. Recall how only a third of the stories written by decider participants

even passed our initial muster. This occurred despite our detailed instructions, iteration of the characteristics of good stories, and breakdown of the steps involved in writing the stories. Story quality can vary greatly, whereas the quality of decision matrices plausibly varies the least...at least, as far as audience members without independent knowledge can verify. Decision matrices are hard for an audience to question since feature values and importance weights are supposed to be personal. Given training, time, and motivation, anyone should be able to come up with at least a few option features, dimensions, and repairs that sound plausible. In contrast, writing or telling a story is an art, and one not easily mastered by everyone. There are many and subtle aptitudes involved—writing/speaking ability, diction, style, etc.

Therefore, even if storytelling is technically the superior decision justification/influence strategy, in actual practice it may not be successfully employed by everyone. Storytelling is plausibly the hardest approach to train people in. Future research is needed on whether people can be trained to create good decision-persuasive stories or not. There may very well be a ceiling that is determined by individual aptitude. It would be useful to develop a scale that assesses people's preferences and aptitudes for writing stories—along the lines of the subjective and objective numeracy scales that assess people's preferences and aptitudes for numbers versus words. Future work is needed to develop and test the effect of a story writing scale on story approach prevalence, story process benefits such as enjoyment, and story quality.

Alternatively, perhaps we can find ways to stimulate, simplify, and shorten the story approach while maintaining its decision benefits. One way would be to forewarn people that their stories are to be used to aid their decision making. That should certainly motivate them to make their protagonists more competent and resourceful. A second way may be to focus on just the mental simulation portion of stories. After all, most deciders in the non-story conditions self-reported as having used some form of prospective storying without being told to. Perhaps they use a curtailed, more on-the-point variant such as mental simulation. A third way would be to show people specific examples of stories that have been written for a different domain—e.g., choosing schools instead of jobs—in addition to giving them general instructions. After all, many audience

participants self-reported themselves as either emulating or planning to emulate the approaches their fictional “deciders” used. Apparently, people can learn decision approaches spontaneously by imitation. Storytelling is a universal pursuit that has been in existence since the dawn of mankind. Given its importance in decision making and influence, perhaps it should be given more attention in basic education than it already has.

8.6 Effects on Long-Term Outcomes

In Chapter 4, we discussed reasons why prospective option repairs and stories should aid long-term outcomes. First, we argued that repairs and stories can aid the resolution of particular cardinal decision issues, which in turn affect long-term outcomes and persuasion of the self and others. Second, decision self-persuasion, implementation, and other-persuasion themselves can lead to long-term benefits. Our concern about the realism of repairs and stories was allayed somewhat by decider participants’ self-reports, which indicated that as far as the participants could tell, their responses to their assigned decision approaches were realistic.

On the other hand, there are ways in which decision matrices and numerical schemes may be superior to option repair and stories for long-term purposes. We have already discussed why option repair is an insufficient decision approach in and of itself. This concern was substantiated in a study on SWOT analysis; surveys of fifty companies who used SWOT analysis revealed that they did not bother to follow through on the actions recommended by their analyses. This suggested that the use of option repairs may indeed be used by people as convenient vehicles to self-persuasion, and not sincere attempts at outcome improvement.

As for stories, they represent single, specific situations. They are questionable as general prescriptions for application across situations and time. Tables, in contrast, can be composed of generalized conclusions based upon large sample sizes. One’s valuation of an option feature, for instance, might very well be based off of one’s many past experiences with that feature. Stories can also digress too much from the key lessons to be illustrated; the key points may be buried within a story among myriad other details.

Tables, in contrast, can be filled in with merely the key points to be made. One can draw people's attention to precisely the points that one wants them to see. As was discussed in section 6.5.1, stories may be effective only for conveying concrete information, whereas tables can consist of concrete or abstract information. Another problem with stories is that their power to evoke emotions (for a review, see Crano & Prislin, 2006) can work against people's long-term interests. Studies have demonstrated the induction of bad judgments and choices by emotions (e.g., Sanfey & Hastie, 1998; Ubel, Jepson, & Baron, 2001).

Tables are also more convenient to create and work with than stories. Story-writing is a complicated art and can be difficult to master, as we discussed in section 8.5 above. Among other things, good stories are supposed to be organized and coherent. Maintaining organization and coherence simultaneously is time- and effort-intensive. A table should be organized as well, but it is much faster to rearrange rows and columns of a table than it is to rearrange parts of a story while maintaining its coherence. Finally, stories take lots of space or time to present. Being linear and composed of prose, a story can take up ten pages to a table's one. A good table would allow one to easily glance at a table and apprehend the messages at hand. The expression "a picture is worth a thousand words" would be apt if one considers a table the "picture."

Finally, resolution of cardinal decision issues that matter to people is no guarantee of long-term outcome maximization. For example, chocolate cake may be Fred's favorite food (i.e., of high "value" to him), but choosing chocolate cake all the time to eat can be deadly. In sum, there are still reasons why one would want to directly test the realism and effects of prospective stories, repairs, and compensatory schemes on long-term choice satisfaction and outcome. To do this, one could conduct longitudinal studies on medical decision making. There have been a variety of studies that focus on the performances of various decision aids for treatment selection, using such criteria as quality of life, process satisfaction, and disease distress (e.g., Hooker et al., 2011; Molenaar et al., 2001). One could apply the same methodologies and decision tasks to compare and contrast the effects of decision matrices, prospective stories, and prospective option repairs on quality of life (for a review of possible quality of life

measures, see de Haan, Aaronson, Limburg, Hewer, & Van Crevel, 1993) and our dependent variables of interest. To verify whether the stories and repairs proposed in the first stage of the studies were realistic or not, one could ask patients at the later stages whether those repairs, story events, and affective reactions actually ended up being implemented or occurring.

We should also test whether one-sided repair or two-sided repair is better for people in the long run. We suspect that two-sided repair is better for maximizing long-term outcome purposes. It is better to repair all options to the best and most realistic extent as one can, then choose among those improved versions of the options, as opposed to merely promoting one's favored option in order to spread alternatives. That is, one should first improve the pool of available options before selecting from the pool. This can be done by improving existing options in the pool as one can instead of seeking new options that already dominate existing options. This scheme could backfire, though, should the repairs generated for some options be less likely to occur than the repairs for other options. A person who wishes to use a two-sided repair decision strategy should thereby be careful to only include repairs that they are confident of implementing. For some options, "the bird in the hand" may very well be better than "two in the bush."

8.7 General Conclusion

We hope this paper has impressed upon readers the value of adding prospective stories and option repair/problem solving to decision scholars, makers, and advisors' repertoires. We discussed their potential contributions to the decision processes, implementation, justification, influence, spreading of alternatives, cardinal decision issues, and narrative persuasion literature. Our studies showed that many people do use those approaches spontaneously. We found that the approaches do aid certain cardinal decision issues, such as implementation and acceptability, in addition to decision self-persuasion, impression management, and influence, regardless of personal characteristics. In contrast, the decision matrix-and-rules approach studied by past scholars only aided self-persuasion, and that only for people who prefer numbers to words. Finally, we found that most people were one-sided rather than two-sided in their spontaneous use of option

repairing and storying, despite the fact that two-sidedness was more effective for other-oriented persuasion. Our findings suggest that there are persuasion and implementation benefits of prospective option repairs and stories that help explain why some people use those approaches. At the same time, there is an enormous opportunity for improving the process used by those who do not already use them. This research thus filled some of the gaps left by the traditional approach in describing, explaining, and prescribing decision processes in non-dominant situations. This work has merely uncovered the tip of an iceberg, and we hope it will inspire new interest and fruitful lines of research in decision and persuasion fields.

Appendices

Appendix A: Persuasion and Implementation Terminology and Long-Term Benefits

A.1 Defining Decision Persuasion and Implementation

What do we mean by “decision persuasion”? Social psychology has typically studied persuasion in terms of on changing attitudes toward something or someone, as opposed to changing their behaviors. Yates (2003) defined a “decision” as “a commitment to a course of action that is intended to produce results that are satisfying to (serve the interests, values of) particular people—the intended ‘beneficiaries’ of that action.” When we talk about “*decision persuasion*,” therefore, we are specifically interested in influences on people’s attitudes and behavioral intentions toward certain courses of action. An example of attitude change would be increasing someone’s liking of a politician, whereas decision persuasion would involve convincing her to cast a vote for that politician, or convincing another person that she was right to cast such a vote.

Decision implementation is the phase after commitment to a decision whereby the decider actually takes the chosen course of action (J. Frank Yates, 2003). For example, Sarah may make a decision at one point to marry Tom, but she still must implement the decision by signing a marriage license with him, holding a wedding, etc. Implementation is one of the cardinal decision issues delineated by Yates (2003). By the “vigor” of implementation, we mean the amount of energy, time, and other resources a person devotes to implementing a chosen option, as well as the amount of enthusiasm the person shows for the option.

A.2 Self- versus Other- Forms of Persuasion

We use the terms “self” and “other” to distinguish between targets of a decision persuasion attempt. We distinguish between three categories of persuasion with respect to decision making based on the target of the persuasion attempt and the maker of the decision (Table A.1):

- a) *Self-persuasion* := persuading oneself with respect to one's own decision
- b) Two types of *Other-persuasion* := persuading others about a decision

- *other-oriented justification* := persuading others with respect to one's own decision
- *other-oriented influence* := persuading others with respect to their decisions

Other-oriented justification is essentially the “acceptability” cardinal decision issue delineated by Yates (1993).

Table A.1. Types of Persuasion by Target and Decider

		Decision maker	
		Self	Others
Persuasion target	Self-persuasion	self-persuasion	
	Other-persuasion	other-oriented justification	other-oriented influence

Note that self-persuasion can involve two kinds of rationale. People might justify their decisions to themselves based on socially acceptable or logical rationales (*self-justification*), when in reality the decision might be based on other unconscious, involuntary, or socially unacceptable drivers. Such drivers may be cognitive—e.g., cognitive biases such as anchoring—or emotional (e.g., fear of death). For instance, a person might be unwilling to jump in the water to save a drowning person due to fear of risk to his own life, but justify it to himself and others by saying, “I’m not the best swimmer here; I should stay out of the water so as to not interfere with the experts.” To convince the American public in 2003 that going to war with Iraq was a good idea, then-President George W. Bush asserted that U.S. national security was directly threatened by Iraq. Despite uncertainty in the evidence, he linked Iraq to the 9/11 attacks and claimed that Saddam Hussein was acquiring or had already acquired nuclear weapons capability. Without such claims, the American public would not have supported going to war with Iraq. Statements by the then-Deputy Secretary of Defense implied that the weapons of mass destruction argument was used not because it was the key factor behind the decision to go to war, but because it provided the strongest justification to the public (Pfiffner, 2004).

Figure A.1 displays the timeline of a generic decision and spreading of alternatives process that incorporates self-persuasion, implementation, and other-persuasion. Suppose the decision problem has non-dominance. Somehow or other the decider latches onto a preferred option (e.g., driven by a gut reaction, presentation style, etc.). However, he experiences dissonance and his confidence in the preferred option is as yet insufficient for him to commit to a decision. He then engages in self-persuasion, "spreading

the alternatives" until his confidence *is* sufficient for him to finalize his decision. The self-persuasion may or may not continue after that. At some point, assuming the confidence is still sufficient, he implements the decision. At some point, he also engages in justifying his choice to other people ("other-oriented justification").

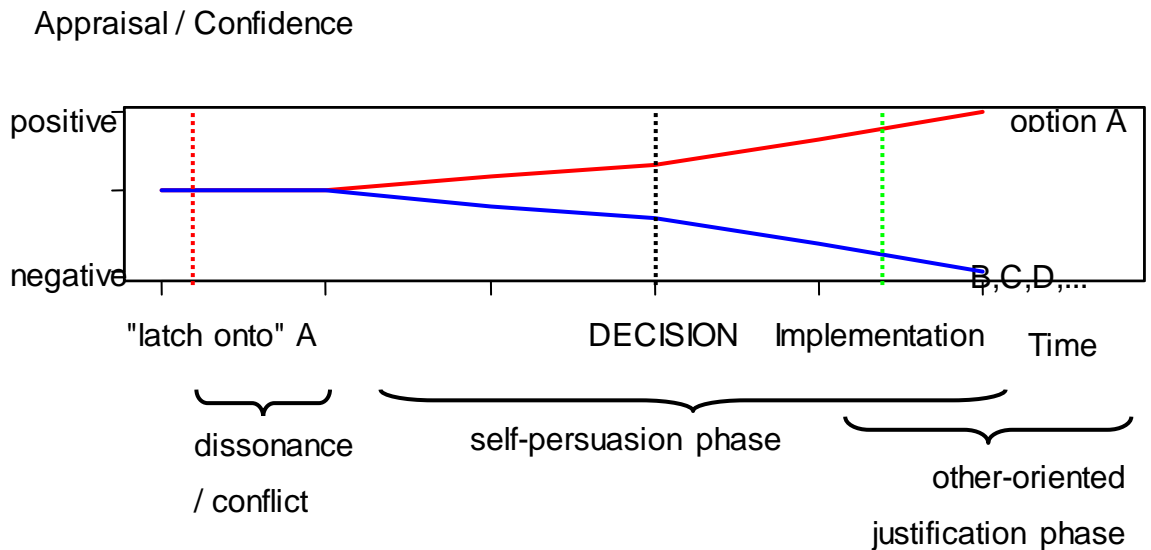


Figure A.1. General timeline of decision processes and spreading of alternatives.

A.3 The Benefits and Appeal of Decision Persuasion and Implementation

To recap, “decision persuasion” can refer to any of the following—self-persuasion, other-oriented justification, or other-oriented influence. Henceforth, when we say an approach or tactic is “effective,” we mean effective for persuasion purposes, not necessarily for long-term outcomes of the decision itself. However, we argue that self-persuasion can help improve long-term outcomes indirectly even if not directly. Self-persuasion leads to ancillary benefits, such as decision paralysis prevention, implementation, and other-persuasion, which in turn aid long-term outcomes. We outline the prescriptive and explanatory benefits as follows.

Decision makers may be driven to self-persuade because:

- a) It makes them feel good about their decisions and their chosen options. If they cannot even persuade themselves that an option is good enough, perhaps they should wait for a better option to come along.
- b) It prevents decision paralysis and compulsive reversals. People who are insufficiently self-persuaded about their decisions may continue to spend time on the process with diminishing returns. They may keep waffling back-and-forth, unable to move on with their lives. Continual decision reversals and implementation plan changes use up a lot of time and energy that can be better spend on other pursuits (Svenson, 2003).
- c) It aids implementation. Self-persuasion motivates them to implement their decisions quickly and vigorously. Perhaps people use self-persuasion as a gauge of how quickly and vigorously they should implement their decision. If one is not confident in one's decision or not fully satisfied with the option, one may still want to take that option before it disappears. However, it may be better to implement the option slowly and without too much vigor, in case it turns out poorly or a better one comes along. Suppose that Tom wants to own a house. He has decided that buying a house is better than not buying one at all (e.g., renting). But he is only semi-happy with any of the currently available houses. He chooses the best house among them to prevent it from being taken by another buyer. However, despite his commitment to the seller, Tom can drag his feet in implementing the choice (e.g., be slow in applying for a loan, set appointments with the seller to be later than necessary). This is so that if a better house should suddenly become available, he can still back out of his first commitment.
- d) It aids other-persuasion. Feeling confident about their decisions makes them feel confident about persuading others as well. Many studies have found that confidence is positively correlated with other-persuasion (e.g., Erickson, Lind, Johnson, & O'Barr, 1978; Leippe, Manion, & Romanczyk, 1992; McCroskey & Mehrley, 1969; Price & Stone, 2004; Wright & Hosman, 1983). Granted,

these studies have been about judgment, not decision making per se. However, making judgments is a part of decision making (J. Frank Yates, 1990), so it makes sense that confidence would play a role in other-persuasion for decisions as well.

Decision makers may be driven to implement their decisions *quickly* because:

- a) They can stop worrying about the decisions and focus their attention on other things
- b) The chosen option may disappear otherwise (e.g., job offers, college acceptances, wedding venues)

Decision makers may be driven to implement their decisions *vigorously* because:

- a) Decision outcomes can be affected by the amount of time, effort, and other resources invested in them. That is, oftentimes “you get out what you put in.” Suppose a student makes a choice to study for her midterm instead of going to a party that night. Then she fails the midterm the next day. The poor outcome does not necessarily mean that she picked the wrong option. She could have merely not implemented her chosen option vigorously enough—e.g., studying for only 30 minutes when she should have studied for three hours.
- b) It aids other-persuasion. Displaying enthusiasm in the chosen option aids other-persuasion. Displaying enthusiasm is another way to show confidence, and confidence is persuasive, as we mentioned before.

Decision makers may be driven to engage in other-oriented persuasion because:

- a) It makes them look competent and look like good decision makers. Humans have a basic need for *impression management*, that is, to look good to other people (e.g., Baumeister, 1982; Leary & Kowalski, 1990; Tetlock & Manstead, 1985). In addition, the opportunities they get can be opened up or closed depending upon their perceived competence as decision makers (e.g., re-election as President of the United States).

- b) It aids decision implementation. Persuading other people that their chosen options are good would garner support and resources from them for implementation. For instance, laws made by Congress can be vetoed by the President if he does not agree with the decisions. Judges can also refuse to enforce laws with which they disagree.

As one can see, there are symbiotic relationships between self-persuasion, implementation, other-persuasion, and impression management:

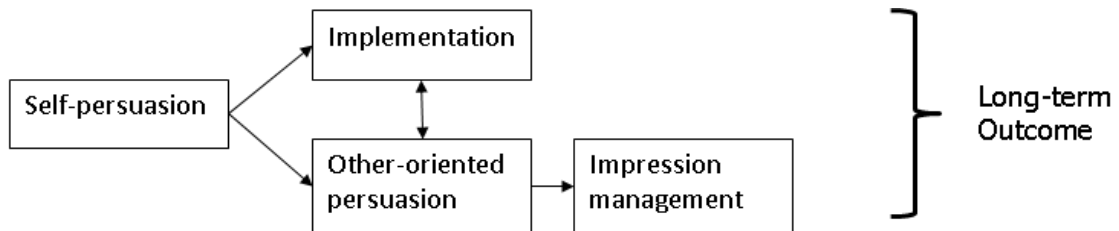


Figure A.2. The relationships among self-persuasion, implementation, other-persuasion, and impression management and their effects on long-term outcomes.

Appendix B: Decider “Bonnie’s Best” Story Instructions

Your task is to compose a coherent and realistic story about yourself—in particular, what your life would be like should you hold a particular job. We will provide you with the details of the job.

As you are probably aware, stories are sequences of interrelated events, dialogues, actions, and personal reactions centered on a protagonist, with supporting characters. In your story, therefore, you should address the following questions: What type of person are you, the protagonist? With what side characters do you interact? What happens in your story? What do you do? How do you feel? What happens in the end? Is the ending a happy one, or a sad one? Although you are free to make up additional details as needed, the story should be realistic and consistent with the details we give you as well as your own self and life.

To help you along, we will take you through the following approach:

1. Read the scenario.
2. Spend at least 5 minutes brainstorming about the story that you would write about that scenario.
3. Answer the prompts asking you to address each of the specific questions above.
4. Write the story.
5. Give the story a title that ties everything together coherently.
6. Review the story with the title and revise as necessary to make them cohere.

Next to your computer should be a hardcopy of the scenario for your reference; ask the experimenter if there isn't and you need one. (Make sure you are looking at the side with the right company name on top.) Feel free to use the provided scratch paper and pen to help you out at any point in the process. You can also copy, cut, paste, and revise text between textboxes.

(1) The scenario: Job at Bonnie's Best

(2) Now, spend at least 5 minutes brainstorming about the story that you would write about the Bonnie's Best scenario.

(3) Answer the prompts asking you to address each of the specific questions above. You should incorporate all the details from the Bonnie's Best scenario (you can copy, paste, and revise as needed). At this point, do not worry about the

organization or any redundancies in your answers. The goal of these prompts is simply to help you generate ideas for your story.

Background: What type of person are you, the protagonist? What is your background?

A large, empty rectangular text input box. The box has a thin black border. At the bottom, there is a horizontal bar with a black and white checkered pattern. On the left side of this bar are two small square buttons: the first contains a left-pointing arrow, and the second is empty. On the right side of the bar are two small square buttons: the first contains a right-pointing arrow, and the second is empty. On the right side of the main box, there are three vertically stacked square buttons: the top one contains an upward-pointing arrow, the middle one is empty, and the bottom one contains a downward-pointing arrow.

Supporting_Charaacters: Whom do you encounter and interact with?

A large, empty rectangular text input box. The box has a thin black border. At the bottom, there is a horizontal bar with a black and white checkered pattern. On the left side of this bar are two small square buttons: the first contains a left-pointing arrow, and the second is empty. On the right side of the bar are two small square buttons: the first contains a right-pointing arrow, and the second is empty. On the right side of the main box, there are three vertically stacked square buttons: the top one contains an upward-pointing arrow, the middle one is empty, and the bottom one contains a downward-pointing arrow.

Events_and_Actions: What do you do and say in the story? What happens to you in the story? What do other people do and say?

A large, empty rectangular text input box. The box has a thin black border. At the bottom, there is a horizontal bar with a black and white checkered pattern. On the left side of this bar are two small square buttons: the first contains a left-pointing arrow, and the second is empty. On the right side of the bar are two small square buttons: the first contains a right-pointing arrow, and the second is empty. On the right side of the main box, there are three vertically stacked square buttons: the top one contains an upward-pointing arrow, the middle one is empty, and the bottom one contains a downward-pointing arrow.

Emotions: How do you feel about what happens?



Repairs: What obstacles come up in the story, and how do you feel about them? What do you do about them, if anything?



Ending: What happens at the end of the story? Do you have a happy ending or a sad ending?



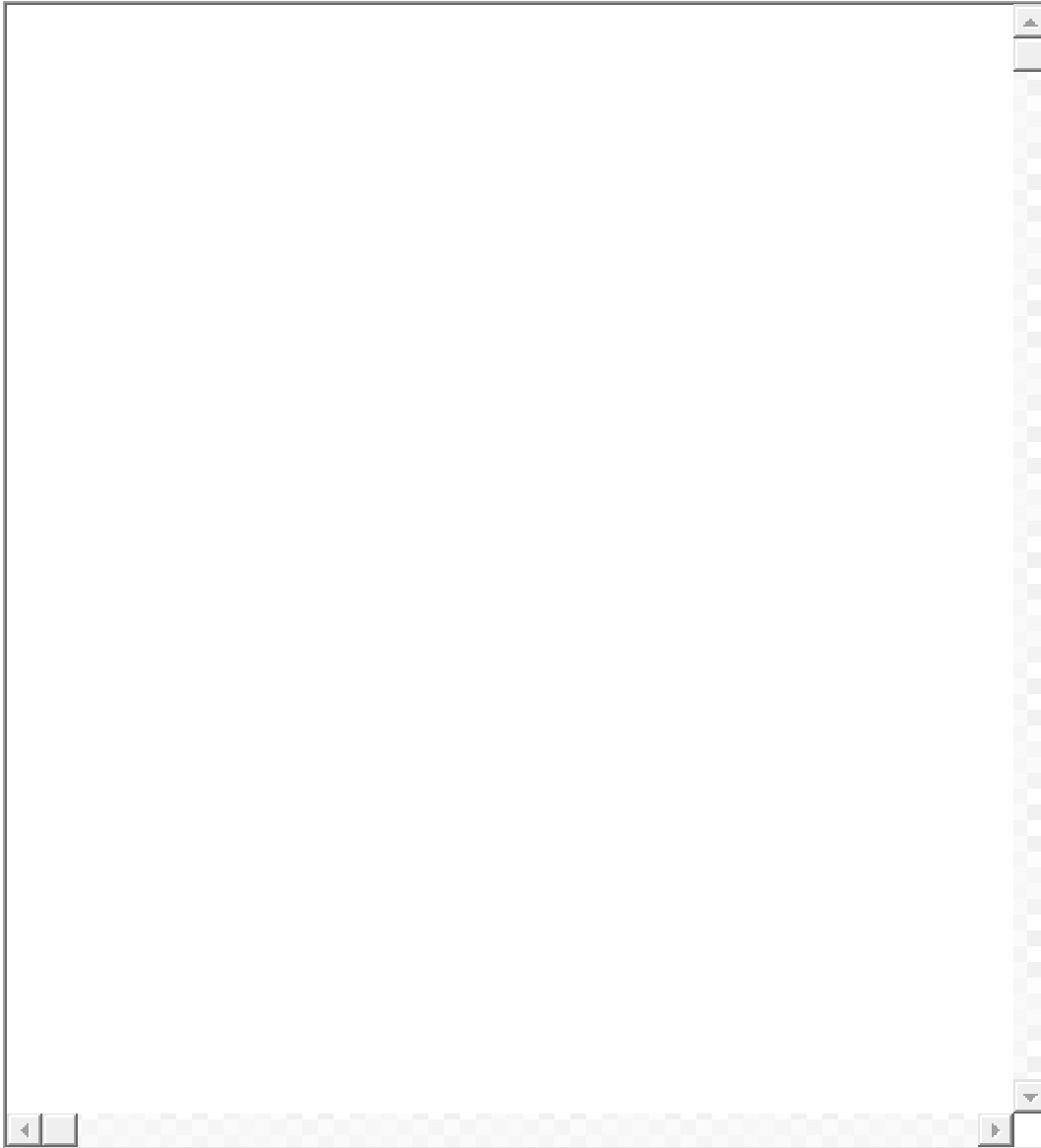
(4) Write the Bonnie's Best story.

Compose your story in the following textbox. You should incorporate what you wrote in the previous step, and integrate them in a coherent manner. You should **assume the reader has not seen any of the above information before**. Therefore, you should include and integrate all of the following in a coherent manner so that that the story would make sense to an outside reader:

- **Details of the Bonnie's Best job**
- **Your responses to the prompts in above**
- **Any other information about you or your personal life that helps the story make sense**

Since you are the protagonist, the story should be written from the first-person perspective.

Story BB: The story of life with Bonnie's Best



(5) Give the story a title that ties everything together coherently.

Now you need to give your story a compelling title. A good story generally has a title that (a) captures and conveys the main theme and/or lesson of the story and (b) is compelling and engaging. Your title should summarize the job sufficiently so as to serve as a reminder of the overall impression of the job you want to convey to readers.

Title of Bonnie's Best Story:

(6) Review the story with the title and revise as necessary to make them cohere.

With the title in mind, review the story you wrote. Does the story make sense and convey the theme implied by the title, and vice versa? Go ahead and revise the story and/or title if necessary until they do.



Appendix C: Story Panel Materials

Story Judge General Instructions

We have hired you to be a Story Judge. In our last experiment, we had asked “decider” subjects to write short stories predicting what their lives would be like should they take a certain job from a company (called either "Bonnie's Best" or "Splendor"). They then used those stories to decide whether to take the job or not.

In our next experiment, we want to test whether showing these types of stories to audiences would help convince them that the deciders made good decisions to take or reject the job offer. We need you to pick out the best stories to use for this purpose. The best stories for our purpose would not only have the typical characteristics of good stories, but also be **realistic and “job-persuasive.”** *We do not* care whether the story writers made mechanical writing errors or not. See more details below.

You will be given several (5-10) different stories to assess. The subjects were allowed to make up additional details as needed, so expect that the details may vary a bit across stories. For each story, you will receive a packet containing the story and questions. Although we want you to give absolute ratings, you can get a sense of the possible range of quality by comparing multiple stories. The process is therefore holistic, and we encourage you to look back and forth between all the stories when evaluating them and answering our questions. So you might want to do something like the following when processing the stories:

- a) Read story 1. In the space on the side, jot down notes and reactions you have throughout the story. Just try to get a sense of how well it meets our needs.
- b) Repeat for all the stories.
- c) For all the stories, answer Question 1, which asks for your immediate overall gut reaction.
- d) Preview the rest of the questions.

- e) Now take each story, and answer the detailed questions. As you analyze more stories and gain more experience, you can modify your responses to the questions on previous stories as needed.
- f) Question 17 allows you to write in your own suggestions for what makes a story meet our needs or not. If you look over your notes on a story and notice aspects we didn't think to ask about, suggest them in Q17.
- g) Finally, look over all the stories again and give your final overall assessment (Question 18).

Feel free to look back and modify your responses to previous questions at any time through the process. You can make notes or write on the sheets. Use the back of the sheets if you need more room for your comments (indicate on the front if you do). Feel free to ask the experimenter questions, too.

Detailed Instructions Regarding Story Assessment

Goodness of Stories: As you are probably aware, stories are sequences of interrelated events, dialogues, actions, and personal reactions centered on a protagonist, with supporting characters. Good stories address the following questions: What type of person is the protagonist? With what side characters do s/he interact? What happens in the story? What do characters do? How do they feel? What happens in the end? Is the ending a happy one, or a sad one? The best stories are also concrete and specific, are coherent, include conflict and conflict resolution, and have descriptive and compelling titles.

Persuasiveness of Stories: **Our main goal is to find the most "job-persuasive" stories.** By "job-persuasive," we mean stories that are good at convincing the reader whether the protagonist should have taken the job or not—that is, either that the protagonist definitely should have taken the job, or that s/he definitely should have turned down the job.

Story Realism: We also want stories that seem like they could occur in someone's real life, NOT fantastical or outlandish ones.

Regarding Mechanical Errors: **Please do not take into account** typos, grammatical errors, punctuation errors, incomplete sentences, etc.—as the writers were told to not worry about their mechanics.

<u>Q #</u>	<u>Topic</u>	<u>Question</u>	<u>For each question, circle your response and write in any comments below.</u>				
Q1a	Immediate overall assessment of job-persuasiveness	What is your immediate overall gut assessment of this story's job-persuasiveness?	0 Clearly should NOT have taken the job	1	2	3	4 Clearly SHOULD have taken the job
Q1b		<u>Comments:</u>					
Q2a	Sequence	To what extent does this story have a well-delineated beginning (initial event), middle (crisis or turning point), and ending (conclusion)?	0 Not at all	1	2	3	4 Very much so
Q2b		<u>Comments:</u>					
Q3a	Protagonist Background	To what extent does the story describe the protagonist and his/her likes and dislikes?	0 Not at all	1	2	3	4 Very much so
Q3b		<u>Comments:</u>					

Q4a	Supporting Characters	To what extent does this story include specific, well-fleshed-out supporting characters?	0 Not at all	1	2	3	4 Very much so
Q4b		<u>Comments:</u>					
Q5a	Actions/Goals	To what extent do the story actors engage in actions to achieve goals?	0 Not at all	1	2	3	4 Very much so
Q5b		<u>Comments:</u>					
Q6a	Causality	To what extent does this story convincingly explain the causes behind events and personal reactions?	0 Not at all	1	2	3	4 Very much so
Q6b		<u>Comments:</u>					
Q7a	Specificity, Concreteness,	To what extent does this story give specific, concrete, and vivid details that draw you into the	0	1	2	3	4

	Vividness	story, rather than rely upon abstract generalities?	Not at all					Very much so
Q7b		<u>Comments:</u>						
Q8a	Emotionality & Perspective-Taking	To what extent does this story let you know what the actors are thinking and feeling?	0 Not at all	1	2	3	4	Very much so
Q8b		<u>Comments:</u>						
Q9a	Conflict (Resolution)	To what extent does the protagonist encounter problems and solve them resourcefully?	0 Not at all	1	2	3	4	Very much so
Q9b		<u>Comments:</u>						
Q10a	Realism	To what extent does this story seem believable? (Like it has a chance of actually happening to the protagonist in real life?)	0 Not at all	1	2	3	4	Very much so
Q10b		<u>Comments:</u>						

Q11a	Coherence	To what extent are the contents of this story understandable and coherent?	0 Not at all	1	2	3	4 Very much so
Q11b		<u>Comments:</u>					
Q12a1	Ending Valence	Is the story's ending happy or unhappy?	-1 Unhappy				1 Happy
Q12a2	Ending Clarity	To what extent is the ending clearly happy/unhappy?	0 Not at all	1	2	3	4 Ending is clearly happy/unhappy
Q12b		<u>Comments:</u>					
	Job Argument	The following 2 questions are about the protagonist's happiness or unhappiness with the job itself, NOT the overall story. A story may disfavor a job (i.e., the protagonist is miserable working the job) even if the story ultimately has a happy ending (e.g., the protagonist finds a new job that s/he loves)!					
Q13a1	Job Argument Valence	Does the story favor or disfavor the job?	-1 Should NOT have taken the job				1 SHOULD have taken the job
Q13a2	Job Argument Strength	How strongly does the story favor/disfavor the job?	0 Not at all	1	2	3	4 Story clearly favors/disfavors job

Q13b		<u>Comments:</u>					
	Title	Good stories have titles that (a) help recall the content of the story, (b) convey the key theme or lesson of the story, and (c) is compelling and engaging.					
Q14a	Title—Recall	To what extent does this story's title help recall the contents of the story?	0 Not at all	1	2	3	4 Very much so
Q14b		<u>Comments:</u>					
Q15a	Title—Theme	To what extent does this story's title convey the key theme/lesson of the story?	0 Not at all	1	2	3	4 Very much so
Q15b		<u>Comments:</u>					
Q16a	Title-- Compelling	To what extent is this story's title compelling and engaging?	0 Not at all	1	2	3	4 Very much so
Q16b		<u>Comments:</u>					

Q17a	Other Factors?	<p>Any other factors we should include that affects how job-persuasive the story is?</p> <p>Feel free to write in your own and circle what your response would be using the scale to the right. Write in as many as you have.</p>					
		<p><u>Other Factor 0:</u></p>	<p>0</p> <p>Not at all</p>	1	2	3	<p>4</p> <p>Very much so</p>
		<p><u>Other Factor 1:</u></p>	<p>0</p>	1	2	3	4
		<p>And so on</p>					
	<p>Final Overall Assessment of Job-Persuasiveness</p>	<p>What is your <i>final</i> overall assessment of this story's job-persuasiveness, taking into account your responses to all the previous questions? You may want to look over your responses to the detailed questions to see if they jibe with your overall assessment. If they do not, there may be other factors that you subconsciously took into account that we should consider when picking good stories. If so, please add those factors to the list in the question above.</p>					
Q18a		<p>What is your final overall assessment of this story's job-persuasiveness?</p>	<p>0</p> <p>Clearly should NOT have taken the job</p>	1	2	3	<p>4</p> <p>Clearly SHOULD have taken the job</p>

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