

Appendix A

Experiment 1 Outcome Satisfaction Task (Simulated Retail Sales Task)

Task Instructions

Intro Screen 1

On behalf of the Miami University Farmer School of Business and the Department of Psychology we welcome you and thank you for your help testing this computerized training program.

The program you will be working with today uses principles of management and learning to help salespersons and commission-based workers develop sales experience in an interactive computer-based environment. If successful, this program will speed training and reduce the cost of training by allowing new employees to undergo some of their initial training online rather than having to do it all in person at the actual place of business. However, this program is a prototype, meaning that it is still in development. That's where you come in.

Intro Screen 2

Please read all instructions carefully!

In a moment, you will enter the prototype training program. There we will ask you to take on the role of a newly hired salesperson. The program simulates the decisions a salesperson must make at the point of sale - i.e., the point at which a salesperson first interacts with a customer. While you make decisions about what actions to take at the point of sale, the computer will keep track of your performance and will record several types of information that will be useful for the research conducted by the School of Business and the Department of Psychology.

In order to make the simulation as true to the real sales situation as possible, you will actually have the opportunity to earn real money today based on your performance as a salesperson. This will be explained more during the training program.

Intro Screen 3

E-Trainer

Congratulations on your decision to pursue an exciting career in customer sales. Many opportunities for employment await successful business persons in such areas as the sale of cars, housing, insurance, and small goods. However, success in sales does not come easily. Employers are increasingly aware of this fact, and want to ensure that their employees bring in the highest possible revenue each time one of their salespersons interacts with a customer.

To better ensure that new salespersons receive the highest-quality instruction available, the Farmer School of Business and the Department of Psychology at Miami University have partnered to produce "e-Trainer," an electronic sales training supplement.

e-Trainer uses the computer to simulate common sales situations, and possible ways of making a sale, giving you the opportunity to gain experience rapidly. We will overview the training program next.

Intro Screen 4

For each sale situation you will see...

SALE SUPPORT. e-Trainer accompanies each sale you make with sale guidance either in the form of computer assistance or supervision from a sales manager.

CUSTOMER STATUS. Salespersons must learn to use information about their customers to determine the best way of making a sale. e-Trainer provides a brief description of each.

SALE CHOICE. For each sale situation you will be given two options for how to attempt to make the sale. Use the sale support and information about customer status to make sound sales decisions.

The next screen shows an example sale situation.

Intro Screen 5: Example

Example Sale Situation

Sale support will be shown in this box during each sale.

Customer

Your current customer will be described here.

Option F

One way of making the sale will be listed here. (You will press the "F" key to select this option.)

Option J

A second way of making the sale will be listed here. (You will press the "J" key to select this option.)

Spacebar to proceed.

Intro Screen 6

Important payment information.

Like a salesperson, today you will be paid money equal to the amount of profit collected from each successful sale (minus the profit lost from each unsuccessful sale).

Profits and losses range from \$0.00 to \$10.00 for a single sale. Your total payment today depends on how many products are sold today (minus the number that are not sold). Thus, it is VERY important that you make as many successful sales as possible.

Intro Screen 7

It is VERY important to do the following for EVERY sale.

First, read the Sale Support information carefully on each sale.

Second, consider the type of customer you are dealing with when you plan your sale approach. However, just as you do not always act the same way in the same situation, a specific type of customer does not always respond the same way each time you use a particular sale approach.

Third, make good decisions to aim for high profits. Your payment depends on your performance for every sale. Your total payment is being increased by the amount of profits gained from each successful sale (and reduced by the losses from unsuccessful sales). \$10 is the most you can gain or lose from a single sale. \$0.00 is the least (if you end up with greater total losses than profits, you will receive \$0.00 total).

Intro Screen 8

A final note about dealing with customers.

The e-Trainer program tries to imitate real sales situations as closely as possible. Even though it is possible to think about customers as belonging to a certain type/category, any particular customer from a certain category also has unique personality characteristics. These unique characteristics are what make sales decisions so unpredictable as well as challenging and rewarding!

Thus, please be aware that e-Trainer mimics this aspect of real-world customers by allowing a specific type of customer to respond to a particular sales approach in more than one systematic way.

Intro Screen 9

Important!

You will begin making real sales next!

Follow the on-screen instructions. To choose a way to make a sale, press either the "F" key or the "J" key unless you are instructed otherwise.

Decision Procedure Manipulation

Choice Condition Trials

| |
|--|
| I trust your opinion on this. |
| This one is all yours. Don't mind me. |
| What do you suggest? |
| What do you think is best? |
| You're free to handle this however you like. |
| Just do this how you think is best. |
| I support your personal opinion on this one. |
| Feel free to make this sale without me. |
| I'm just here for support. |
| Trust your own judgment. |
| Whatever you decide will be just fine. |
| I trust your opinion on this. |
| This one is all yours. Don't mind me. |
| What do you suggest? |
| What do you think is best? |
| You're free to handle this however you like. |

| |
|--|
| Just do this how you think is best. |
| I support your personal opinion on this one. |
| Feel free to make this sale without me. |
| I'm just here for support. |
| Trust your own judgment. |
| Whatever you decide will be just fine. |

No-Choice Condition Trials

| |
|---|
| You're kidding yourself if you think you can make this sale without me. I say Option J. |
| Don't make a move without my word first. Select Option F. |
| You have to choose Option J. |
| You should listen to me, your boss, when making sales decisions. Do Option F. |
| I expect you to always check with me before starting a sale. Select Option J. |
| I want you to choose Option F. |
| Let me handle this my way. You do Option J. |
| I'm going to take care of this sale like I want to. Option F. |
| I expect you to do Option J. |
| Listen. Option F. |
| Pay attention. Option J. |
| You're kidding yourself if you think you can make this sale without me. I say Option F. |
| Don't make a move without my word first. Select Option J. |
| You have to choose Option F. |
| You should listen to me, your boss, when making sales decisions. Do Option J. |
| I expect you to always check with me before starting a sale. Select Option F. |
| I want you to choose Option J. |
| Let me handle this my way. You do Option F. |
| I'm going to take care of this sale like I want to. Option J. |
| I expect you to do Option F. |
| Listen. Option J. |
| Pay attention. Option F. |

Random Condition Trials

The computer will now make a selection randomly. Please review this sale. Then press Spacebar to see the selection.

Sale Action Options

| | |
|--|---|
| Tell the customer about special deals. | Only mention special deals if customer asks about them. |
| Tell the customer they would be really helping you out if they would purchase something. | Don't mention any such thing. |
| Give the customer a detailed tour of the store merchandise. | Only give a detailed tour of the merchandise if the customer asks for it. |
| Encourage the customer to buy something. | Do not push the customer to buy. |

| | |
|--|---|
| Try to persuade the customer to buy the most expensive products possible. | Try to persuade the customer to buy mid-range priced products. |
| Tell the customer about the pros and cons of each product. | Only tell the customer about product pros and cons if they ask for it first. |
| Try to sell the old inventory first to make room for new items. | Tell the customer to wait until the older inventory goes on sale the next day. |
| Actively follow the customer around store. | Wait for the customer to seek you out. |
| Start a pleasant conversation with the customer. | Do not talk to the customer unless they talk to you first. |
| Try to convince the customer to buy multiple items. | Do not try to convince the customer to buy additional items. |
| Flirt with the customer to help the sale go smoothly. | Do not flirt with the customer. |
| Play on the customer's sympathies by telling them it's your first day as a salesperson. | Refrain from mentioning that it's your first day as a salesperson. |
| Focus the customer's attention on big-ticket items like TVs, computers, etc. | Focus the customer's attention on mid-range priced items like accessories, movies, etc. |
| Act confident. | Act shy. |
| Focus the customer's attention on the special features of the products, and avoid the price. | Mention the product prices up front. |
| Focus on selling the store's hardest to sell items. | Focus on selling the store's easiest to sell items. |
| Try to be entertaining when talking to the customer. | Stick to the facts when talking to the customer. |
| Talk to the customer as much as possible. | Listen to the customer as much as possible. |

Screen: Manipulation Check Instructions

“Follow-up Questions”

We would like to ask you a few brief questions for development and design purposes.

All the questions from this point forward are for design purposes only. Your responses to these questions will NOT change your scores (or payment).

We greatly appreciate your genuine feedback to help our design team, so please be as honest as possible in reporting your reactions.

Screen: Manipulation Check

Next, participants were shown each manager one at a time and asked to rate each manager in terms of self-determination. Items were presented one-by-one at random within the question field.

Questions:

Self-Determination

1. I had personal freedom.
2. I felt free to live life according to my desires.
3. My sales were determined by my own actions.
4. I determined what would happen.

Diagnostic Outcomes (73% of trials)

| | |
|---------|----------------|
| \$10.00 | loss, large |
| \$9.50 | loss, large |
| \$5.00 | loss, moderate |
| \$4.50 | loss, moderate |
| \$0.50 | loss, small |
| \$0.25 | loss, small |
| \$0.25 | gain, small |
| \$0.50 | gain, small |
| \$4.50 | gain, moderate |
| \$5.00 | gain, moderate |
| \$9.50 | gain, large |
| \$10.00 | gain, large |
| \$0.00 | status quo |
| \$0.00 | status quo |
| \$0.00 | status quo |
| \$0.00 | status quo |

Additional Outcomes Simulating Variability (27% of trials)

| | |
|---------|---------------|
| \$9.00 | large loss |
| \$4.00 | moderate loss |
| \$1.00 | small loss |
| \$1.00 | small gain |
| \$6.00 | moderate gain |
| \$10.00 | large gain |

Appendix B

Experiment 2 Instructions

Outcome Satisfaction Task (Card Task)

Cover Story

Said to participant at beginning of experiment, when introducing the study:

This research is being conducted jointly between the Farmer School of Business and the Department of Psychology to test a computerized training and assessment program for salespeople. The program is currently in the last stages of development, so we will ask you to complete the training and assessment so that you can provide us feedback about aspects of the program, such as ease of use and screen layout.

You will receive two forms of compensation today. Psychology course research credits. You will also be paid based on your performance on the training and assessment program.

We will start with a brief orientation on the computer that explains the specific details of the study, what you'll be asked to do today, and your payment. Once you get started it is very important that you read all of the instructions carefully. We will test your understanding of the instructions afterward.

Screen 1

On behalf of the Miami University Farmer School of Business and the Department of Psychology, we welcome and thank you for your help testing this computerized assessment program for salespeople.

Learning to make good decisions is essential to becoming an effective salesperson. As such, employers in the retail sales market are seeking cost-effective assessments of potential employees' learning and decision-making ability. The program you will be working with today attempts to provide such an assessment. If successful, employers will use this program as part of their application process and may even use it as a training tool for new salespeople. However, the program is still in the test and development phase. That is where you come in.

Screen 2

“Your Role”

In a moment, you will enter the prototype assessment program. While you make decisions today, the computer will keep track of your performance and will record several types of information that will be useful for the research conducted by the School of Business and the Department of Psychology.

To ensure your feedback is as informative as possible to our design team we ask that you please try your best to take on the role of an actual applicant who sincerely wants to be hired as a salesperson.

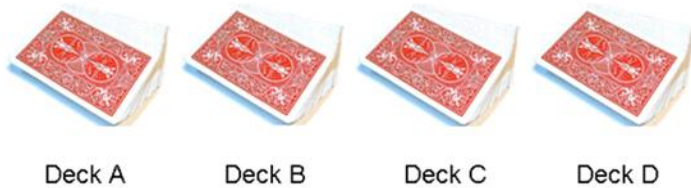
Please keep in mind that future applicants will experience real consequences (acceptance or rejection) based in part on how well they perform on this task. Please try to make your performance as strong as possible.

Screen 3

“Training/Assessment Task Explanation”

Decks

The cards in each deck below have been assigned a monetary value ranging from \$1 to \$9. Each of the 4 decks has its own average payout, so some decks have higher paying cards on average than other decks.

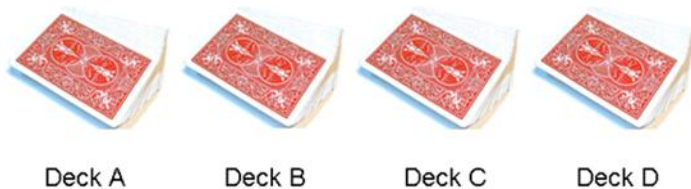


Screen 4

“Training/Assessment Task Explanation”

Decision Task

This program measures your decision-making ability and potential as a salesperson based on your ability to get good payoffs. Your task is to learn enough about the deck's payoffs to choose a deck accordingly. Your score on the assessment will be determined by the typical payoff you earn across the entire task (i.e., your AVERAGE payoff). This will indicate whether you, on average, made good decisions. You can increase or decrease your score depending on your ability to learn to make better decisions.



Screen 5

“How to enter your choice on each trial”

As part of the training aspect of this program, you will receive guidance during each decision you make. The guidance is in the form of a computerized manager. Begin each decision by reading the advice given here (above the decks) first.



Deck A

Deck B

Deck C

Deck D

To select a deck during the task, press the corresponding key on the keyboard. The keys are labeled (A, B, C, and D).

Screen 6

“Performance Standards”

We have advised employers to use certain performance standards in hiring salespeople. These standards are explained next.

Note that today we will be keeping track of your performance.

Screen 7

A. Participants in the Single Reference Point condition saw these instructions.

“Performance Standards”

\$5 Typical Performance

The majority of people score \$5. Salespersons that score \$5 will get standard consideration during the hiring process.

\$4, \$3, \$2, or \$1: Scoring further and further below typical performance indicates poorer and poorer performance. Scores will be treated accordingly during the hiring process.

\$6, \$7, \$8, or \$9: Scoring further and further above typical performance indicates better and better performance. Scores will be treated accordingly during the hiring process.

A. Participants in the Multiple Reference Point condition saw these instructions.

\$5 Typical Performance (Standard Pass)

The majority of people score \$5. Salespersons that pass with a score of \$5 will get standard consideration during the hiring process.

Passing with a \$4, \$3, or \$2: Scoring further and further below typical performance indicates poorer and poorer performance. Scores will be treated accordingly during the hiring process.

Passing with a \$6, \$7, or \$8: Scoring further and further above typical performance indicates better and better performance. Scores will be treated accordingly during the hiring process.

\$1 Failure

Very few people score this poorly (\$1 is an extremely low score). Salespersons consistently scoring \$1 have failed the training/assessment and will not be hired.

\$9 Superb

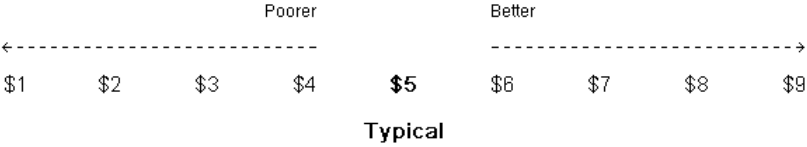
Very few people score this well (\$9 is an extremely high score). Scoring this high indicates that the salesperson demonstrates ability that is significantly above average and deserves special consideration during the hiring process.

Screen 8

A. Participants in the Single Reference Point condition saw these instructions.

“Summary of Performance Standards”

Please review these evaluation standards carefully. Once you have committed them to memory, please continue.

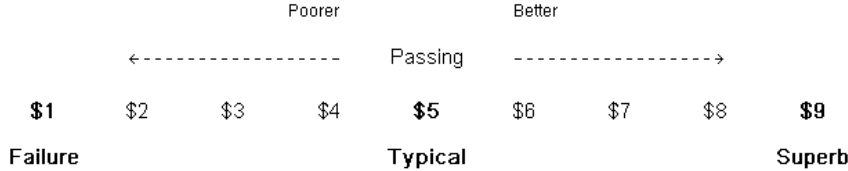


Because you will make many decisions during this training/assessment, the best way to keep track of your performance is based on the outcome of each INDIVIDUAL decision trial. For example, if you consistently score \$5 across trials you will likely score an average of \$5 (Typical passing score).

B. Participants in the Multiple Reference Point condition saw these instructions.

“Summary of Performance Standards”

Please review these evaluation standards carefully. Once you have committed them to memory, please continue.



Because you will make many decisions during this training/assessment, the best way to keep track of your performance is based on the outcome of each INDIVIDUAL decision trial. For example, if you consistently score \$5 across trials you will likely score an average of \$5 (Typical passing score).

Screen 9

“Your Payment”

In retail sales, salespeople earn a commission based on their decision-making (sales) performance.

Thus, to make the simulation of decision settings as realistic as possible, you will earn money today based on your decision-making performance. Our development team received grant money to fund the development of this program.

You will receive this payment in addition to any research credits you earn by participating in this study.

Your payment will be explained next.

Screen 10

“We will pay you based on your performance”

Your score on the training/assessment program is the AVERAGE of all the payoffs you receive during the decision task. Your payment today will equal this score.

Examples:

- If you score \$1 on the assessment, we will pay you \$1.
- If you score \$5 on the assessment, we will pay you \$5.
- If you score \$9 on the assessment, we will pay you \$9.

The best way to keep track of your performance is based on the monetary payoff you receive after each INDIVIDUAL decision trial. For example, if you consistently receive \$5 across trials you'll be paid \$5.

Screen 111

“You will begin the actual training/assessment on the next screen!”

IMPORTANT!

From this point forward we ask that you do your best to achieve BOTH (1) a strong application for retail sales and (2) high personal monetary earnings. This will ensure the most informative feedback for our design team.

Please wait patiently. The administrator will be by shortly to start the program.

Performance Payment, Goal, and Instructions Quiz

After the participant completed the orientation (introductory instructions), the experimenter gave the participant a paper and pencil based Performance Goal Quiz, which tested the participant's understanding of the payment procedures and reference point. The quiz was completed privately at the participant's computer station. When completed, the experimenter checked the participant's answers, taking note of any incorrect responses. The experimenter explained the correct answer to any questions that were answered incorrectly, and asked the participant to correct their work before proceeding with the rest of the experiment.

A. *Quiz for Single Reference Point:*

PERFORMANCE & PAYMENT STANDARDS

Our design team must check that the instructions make sense. Thus, it is important to verify that you understand how your performance on the card-based decision-making assessment will be evaluated today. Please answer the following questions.

1. What single score on the decision task is considered *typical of most people*? [correct = \$5]

It is also important that you understand how your payment today will be determined. Please fill in the blanks on the following questions.

2. What will we pay you if you score an average of \$5 on the assessment? [correct = \$5]
3. What will we pay you if you score an average of \$1 on the assessment? [correct = \$1]
4. What will we pay you if you score an average of \$9 on the assessment? [correct = \$9]

A. *Quiz for Multiple Reference Point:*

PERFORMANCE & PAYMENT STANDARDS

Our design team must check that the instructions make sense. Thus, it is important to verify that you understand how your performance on the card-based decision-making assessment will be evaluated today. Please answer the following questions.

1. What single score on the decision task is considered *typical of most people*? [correct = \$5]
2. What single score below is a *failing* score (i.e., extremely poor performance)? Circle one.

\$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 [correct = \$1]

3. What single score below is a *superb* score (i.e., extremely good performance) and would cause employers to give an applicant special consideration? Circle 1

\$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 [correct = \$9]

It is also important that you understand how your payment today will be determined. Please fill in the blanks on the following questions.

4. What will we pay you if you score an average of \$5 on the assessment? [correct = \$5]
5. What will we pay you if you score an average of \$1 on the assessment? [correct = \$1]
6. What will we pay you if you score an average of \$9 on the assessment? [correct = \$9]

Decision Procedure Manipulation

Choice Condition Trials

| |
|--|
| I value your input. What deck do you suggest? |
| I'm just here for your support. Don't mind me. |
| I appreciate your perspective on this. Please choose for yourself. |
| Feel free to handle this decision yourself. |
| You can select any deck you like. |

No-Choice Condition Trials

| |
|---|
| When I'm in charge, decisions must be made through me. Choose Deck #. |
| Decisions must be approved by me, your boss. Select Deck #. |
| I'm not interested in your opinion. Choose Deck #. |
| Your input is not wanted. I say choose Deck #. |

Screen: Manipulation Check Instructions

“Follow-up Questions”

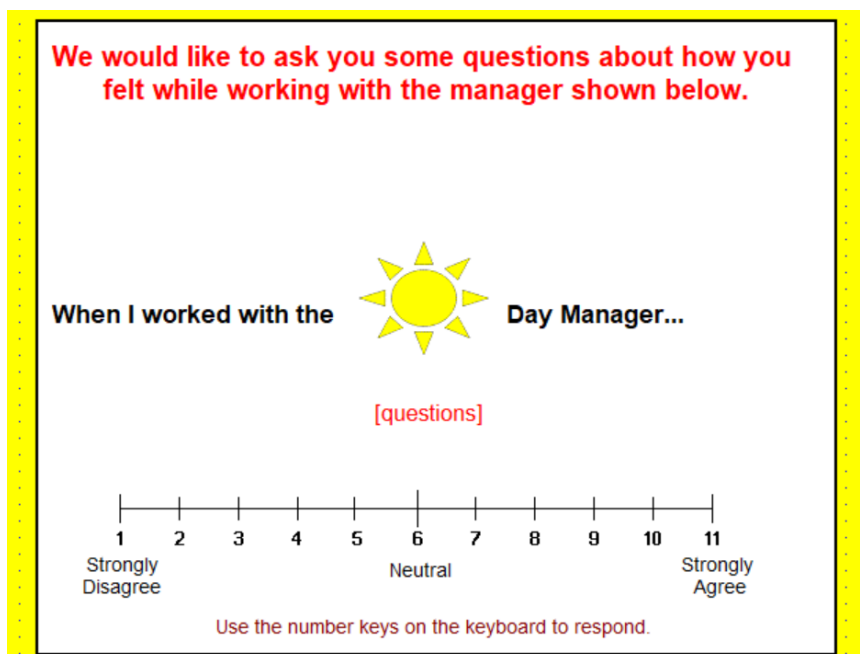
We would like to ask you a few brief questions for development and design purposes.

All the questions from this point forward are for design purposes only. Your responses to these questions will NOT change your scores (or payment).


We greatly appreciate your genuine feedback to help our design team, so please be as honest as possible in reporting your reactions.

Screen: Manipulation Check

Next, participants were shown each manager one at a time (see example screenshot below) and asked to rate each manager in terms of self-determination, procedural fairness, competence, and belonging. Items were presented one-by-one at random within the question field.



We would like to ask you some questions about how you felt while working with the manager shown below.

When I worked with the  Day Manager...

[questions]

1 2 3 4 5 6 7 8 9 10 11

Strongly Disagree Neutral Strongly Agree

Use the number keys on the keyboard to respond.

Questions:

Self-Determination

1. I had personal freedom.

2. I felt free to live life according to my desires.
3. My deck selections were determined by my own actions.
4. I determined what would happen during each deck choice.

Procedural Fairness

1. I felt I was treated justly.
2. I felt I was treated fairly.
3. I felt the manager used a just process to manage the decision situation.
4. I felt the manager used a fair process to manage the decision situation.

Competence

1. The manager made me feel like I was competent.
2. The manager made me feel like I was skilled and able.

Belonging

1. I felt like the manager accepted me.
2. I felt treated like I belonged.

Choice Tradeoff Task

Task Instructions

Screen 1

“Important Instructions”

Our design team has also been asked to determine what types of training and work conditions individuals prefer to work under. Thus, over the next several screens, we will be showing you job offers by different managers. We would like to know which job offers you prefer.

Screen 2

“Choose a Job Offer”

Imagine that we asked you to complete another training/assessment (card-based decision) task. HOWEVER, this time you could choose ONE manager to work with the entire time.

In particular, in each question, we will show you “hiring” offers made by each of the two managers. To indicate which offer you prefer, simply consider all aspects of that offer and select the one you most prefer.

You may be surprised to see that we will show you many different offers (around 30). The reason for this is to ensure we get an accurate account of your preferences. We appreciate your patience and diligence.

This will take only a few minutes.

Next, participants completed the choice tradeoff task.

Appendix C

Supporting Data for Experiments 1 and 2

Table C1

Outcome Satisfaction Ratings (Mean, Standard Deviation, 95% Confidence Intervals) as a Function of Choice Procedure and Outcome in Experiment 1.

| Outcome | Decision Procedure | | | | | |
|---------|--------------------|---------------|------------------|---------------|------------------|---------------|
| | Choice (N=79) | | No-Choice (N=79) | | Random (N=64) | |
| | <i>Mean (SD)</i> | <i>95% CI</i> | <i>Mean (SD)</i> | <i>95% CI</i> | <i>Mean (SD)</i> | <i>95% CI</i> |
| \$-9.75 | 2.17 (1.74) | 1.78–2.56 | 1.82 (1.36) | 1.52–2.13 | 1.78 (1.34) | 1.45–2.12 |
| \$-4.75 | 2.44 (1.61) | 2.09–2.81 | 2.13 (1.51) | 1.80–2.47 | 2.37 (1.75) | 1.93–2.80 |
| \$-0.38 | 2.69 (1.69) | 2.31–3.07 | 2.89 (1.76) | 2.43–3.22 | 2.64 (1.68) | 2.22–3.06 |
| \$0 | 3.29 (1.69) | 2.91–3.67 | 3.17 (1.56) | 2.82–3.52 | 3.31 (1.49) | 2.94–3.68 |
| \$0.38 | 5.92 (1.87) | 5.51–6.34 | 5.40 (1.93) | 4.97–5.83 | 5.58 (1.91) | 5.10–6.06 |
| \$4.75 | 7.19 (1.50) | 6.85–7.53 | 6.70 (1.94) | 6.27–7.14 | 6.84 (1.53) | 6.46–7.23 |
| \$9.75 | 8.29 (1.05) | 8.06–8.53 | 7.66 (1.71) | 7.28–8.04 | 7.74 (1.75) | 7.31–8.18 |

Table C2

Outcome Satisfaction Ratings (Mean, Standard Deviation, 95% Confidence Intervals) as a Function of Choice Procedure and Outcome (Experiment 2).

| Outcome | Choice | | No-Choice | |
|---------|------------------|---------------|------------------|---------------|
| | <i>Mean (SD)</i> | <i>95% CI</i> | <i>Mean (SD)</i> | <i>95% CI</i> |
| \$1 | 1.65 (1.40) | 1.38–1.92 | 1.22 (0.62) | 1.10–1.34 |
| \$2 | 1.99 (1.21) | 1.76–2.22 | 1.79 (0.86) | 1.62–1.95 |
| \$3 | 2.73 (1.32) | 2.48–2.98 | 2.65 (1.05) | 2.45–2.85 |
| \$4 | 3.83 (1.30) | 3.58–4.08 | 3.61 (1.09) | 3.40–3.82 |

| | | | | |
|-----|--------------|-------------|-------------|------------|
| \$5 | 5.79 (1.22) | 5.56–6.02 | 5.38 (1.06) | 5.18–5.58 |
| \$6 | 6.88 (1.06) | 6.68–7.08 | 6.21 (1.13) | 6.00–6.43 |
| \$7 | 8.28 (0.92) | 8.10–8.45 | 7.51 (1.21) | 7.28–7.74 |
| \$8 | 9.59 (0.69) | 9.46–9.72 | 8.83 (1.26) | 8.59–9.07 |
| \$9 | 10.70 (0.58) | 10.59–10.81 | 9.99 (1.56) | 9.69–10.29 |

Table C3

Percent Choosing the Choice Job Offer for All Outcomes (Averaged) and Separated by Losses and Gains

Outcomes

| Difference in Pay (Choice vs. No Choice) | All Outcomes | | Loss Outcomes | | Gain Outcomes | |
|---|----------------|----------------|---------------|----------------|---------------|--|
| | Mean (SD) | Mean (SD) | 95% CI | Mean (SD) | 95% CI | |
| -\$1 (\$1 vs. \$2 to \$8 vs. \$9) | 64.35% (39.41) | 59.95% (41.29) | 52.08–67.83 | 68.75% (41.32) | 60.87–76.63 | |
| -\$2 (\$1 vs. \$3 to \$7 vs. \$9) | 36.24% (40.57) | 33.10% (40.85) | 25.31–40.89 | 40.43% (43.96) | 32.05–48.82 | |
| -\$3 (\$1 vs. \$4 to \$6 vs. \$9) | 20.52% (34.00) | 17.59% (33.88) | 11.13–24.06 | 26.39% (40.13) | 18.73–34.04 | |
| -\$4 (\$1 vs. \$5 to \$5 vs. \$9) | 12.22% (28.26) | 11.11% (28.46) | 5.68–16.54 | 16.67% (37.44) | 9.53–23.81 | |
| -\$5 (\$1 vs. \$6 to \$4 vs. \$9) | 8.56% (25.84) | — | — | — | — | |
| -\$6 (\$1 vs. \$7 to \$3 vs. \$9) | 7.72% (24.80) | — | — | — | — | |
| -\$7 (\$1 vs. 8 to \$2 vs. \$9) | 6.94 (25.08) | — | — | — | — | |
| -\$8 (\$1 vs. \$9) | 7.41 (26.31) | — | — | — | — | |

Note: The choice offer was always lower than the no-choice offer.

Appendix D

Models

Outcome Satisfaction Models

To gain additional insight into the psychological process of outcome valuation, we generated and tested several regression-like computational models of our hypothesized attention weighting mechanism. Our goal was to capture the observed pattern of outcome satisfaction (Figure 4), and compare that performance to a more traditional model that assumes that only outcomes matter. This analysis allows us to directly test the usefulness of incorporating procedural utility as a factor in representations of consequentialist decision making.

Rather than discuss all possible models, we focus on three particularly informative exploratory models. Each model consisted of intercepts and slopes, which attempted to match the outcome satisfaction data. The estimated values of these parameters provided insight into potential cognitive processes.

Baseline model. The more traditional *baseline model* calculated the satisfaction of outcome x as $m_G \cdot x + \beta_G$ for gains and $m_L \cdot x + \beta_L$ for losses, where m is an intercept that represents the starting satisfaction level for an outcome, and β is a slope representing the rate of change in outcome satisfaction from one outcome on the scale (e.g., \$1) to the next (e.g., \$2). Thus, this was a piecewise linear subjective utility model that consisted of two intercepts and two slopes. This model represents a situation in which outcome satisfaction is determined solely by outcomes, and loss outcomes are allowed to be experienced differently than gains in terms of both starting point (m_G vs. m_L) and rate of change (β_G vs. β_L).

Procedural utility models. We explored three potential procedural utility models. In the *full model*, the choice procedure received a set of intercept and slope parameters to account for losses ($m_L \cdot x + \beta_L$) and another set of intercept and slope parameters to account for gains ($m_G \cdot x + \beta_G$). The no-choice procedure received its own set of intercepts and slopes for the losses and gains. Hence, this model assumes that decision procedures have a different effect on outcome satisfaction, depending on both valence (loss, gain) and magnitude (\$1 to \$9). The *matched-slopes model* simplified the full model by

forcing the slopes for choice and no-choice to be equal within losses and gains respectively. Hence, this model disregards differences in marginal utility and assumes that saliency of the decision procedure is constant for every loss (\$1-\$4) or gain (\$5-\$9), with potentially different effects on losses and gains overall. The *constrained model* further simplified the model by using the same intercept and slope parameters for both decision procedures when outcomes are losses. This model assumes that individuals attend to procedures (and outcomes) when outcomes are gains, but ignore procedures entirely when outcomes are losses.

Model Performance. The overall results were identical across several different fit indices; therefore, we report the *Bayesian information criterion* (BIC) of model fit. The BIC quantifies how well a model can recreate the observed data patterns, while penalizing models with more parameters (Schwarz, 1978). Positive BIC values indicate poorer fit, whereas increasingly negative numbers indicate better fit. Differences in BICs of 2-6 points (*positive*) or more (10+, *very strong*) indicate significant improvements in model fit (Kass & Raftery, 1995).

The procedural utility models of outcome satisfaction ($BICs < -50$) substantially improved upon the purely consequentialist baseline model ($BICs = -36$) (Table D1, Figure D1). As a purely consequentialist model, the baseline model ignores the positive difference in outcome satisfaction caused by choice procedure. Its estimates are derived from the average satisfaction level observed for each outcome \$1-\$9, which often lie between the observed values. As such, this model generally underestimated satisfaction felt during choice trials and overestimated satisfaction felt during no-choice trials (see Figure D1).

The matched-slopes model provided the best fit to the data ($BIC = -57$; Figure D1). This model is consistent with an attention weighting mechanism by which individuals emphasize decision procedures (procedural utility) more for gains than losses, but do not entirely ignore procedural utility for losses, as assumed by the constrained model. Across all models, the slope estimates were essentially the same, at approximately 0.79 for losses and 1.25 for gains. This indicates that the full model's additional slopes were unnecessary and that treatment of starting satisfaction levels (intercepts) was critical. Thus, rather

than assume that the saliency of decision procedures changes at each outcome level (\$1-\$9; full model, $BIC=-51$) or that procedures are absolutely ignored when outcomes are losses (constrained model, $BIC=-54$), it seems more appropriate to conclude that the saliency of procedures decreases uniformly for any outcome that represents a loss.

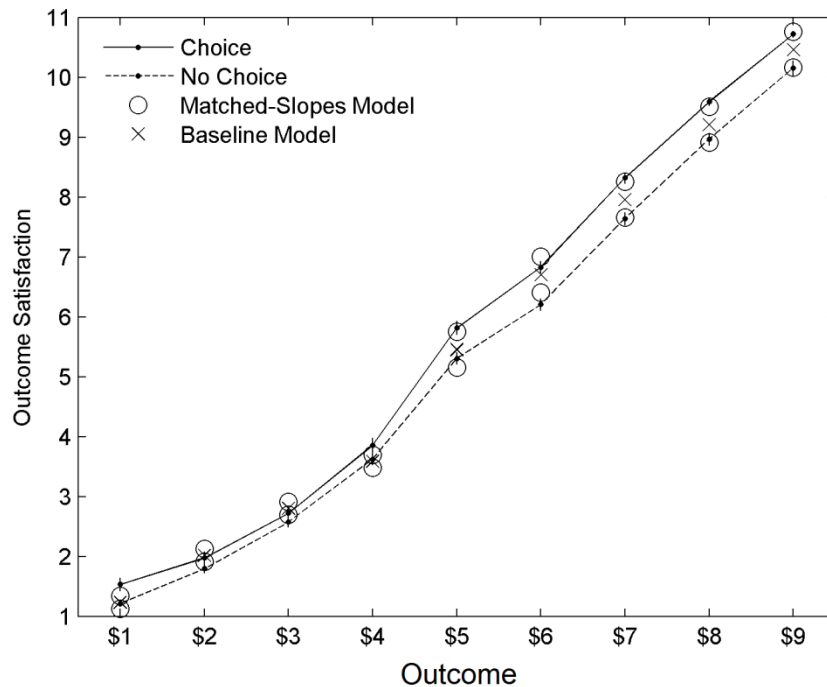
Table D1

Model Parameters and Fit Statistics for the Outcome Satisfaction Data

| Model | Decision Procedure | Intercepts | | Slopes | | BIC |
|----------------|---------------------------|-------------------|-------|---------------|-------|------------|
| | | Losses | Gains | Losses | Gains | |
| Baseline | – | 0.45 | -0.81 | 0.79 | 1.25 | -36 |
| Full | Choice | 0.59 | -0.52 | 0.77 | 1.25 | -51 |
| | No Choice | 0.3 | -1.09 | 0.8 | 1.25 | |
| Matched-Slopes | Choice | 0.56 | -0.51 | 0.79 | 1.25 | -57 |
| | No Choice | 0.34 | -1.11 | | | |
| Constrained | Choice | 0.45 | -0.51 | 0.79 | 1.25 | -54 |
| | No Choice | | -1.11 | | | |

Figure D1

Model Predictions for Outcome Satisfaction: Baseline and Matched-Slopes Models



Preference Tradeoff Models

Baseline model. We focused our preference tradeoff models on the data within the \$1 difference range (see Figure 9, top line), given the likelihood that tradeoffs between procedures and outcomes occur primarily within this range. The *baseline model* calculated the utility of each payoff, ignoring decision procedures, based on conventional representations of reference-dependent subjective expected utility. To account for the stochastic nature of decision making, the model used the logistic function $1/(1 + e^{-\mu})$. This function predicted the impact of utility differences (differences in anticipated pay) based on the likelihood of choosing a particular option: μ was the utility of the choice option's payoff, minus the utility of the no-choice option's payoff. Because of the constant \$1 difference in pay, this model always favored no-choice, at a constant rate.

Procedural utility models. We tested three models that incorporated procedural utility by applying some bonus to the derived utility of the payoff promised by the choice manager (e.g., the calculated utility of \$1, plus any additional estimated utility derived from choice). Thus, attention weighting was embodied by the presence/absence of this bonus, which was an estimated parameter.

The *additive model* added a value to the choice outcome before calculating μ . This model assumed that individuals emphasize choice to the same extent regardless of whether outcomes are losses or gains. The *loss-averse model* allowed for different bonuses for losses and gains. The *status-quo biased model* incorporated an additional parameter to allow the bonus to change specifically when the decision was between the first loss on the scale and the status quo (i.e., *Choice \$4* vs. *No-Choice \$5*).

Performance. The models incorporating procedural utility into the preference calculation markedly improved upon the baseline model (Table D2). The baseline model ($BIC=-16$) underestimated preference for choice by an average of 37% (Figure D2). The loss averse procedural utility model provided the best fit to the data ($BIC=-52$), estimating a utility bonus of 1.79 for gains and 1.40 for losses. The status-quo biased procedural utility model fit nearly as well ($BIC=-51$). Both of these models support the conclusions that individuals based their decisions on procedures more when the outcomes at stake were gains than when they were losses. In contrast, the additive model assumed a constant benefit of procedural utility across gain and losses, and performed worse than the other procedural utility models ($BIC=-45$).

Figure D2

Model Predictions for Preference Tradeoffs: Baseline, Additive, and Loss Averse Models

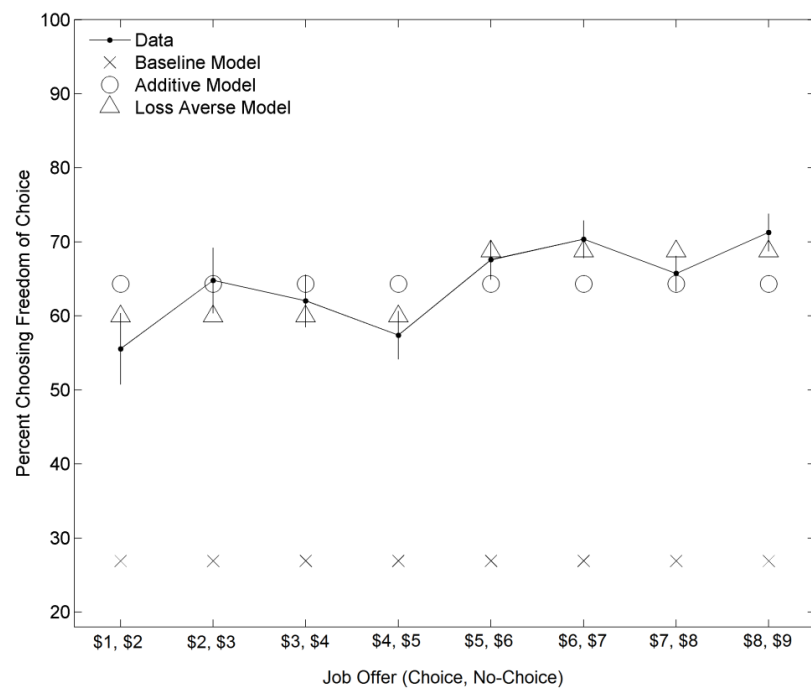


Table D2*Model Parameters and Fit Statistics for the Preference Tradeoff Data.*

| <u>Model</u> | <u>Decision Procedure</u> | <u>Bonuses</u> | | | <u>BIC</u> |
|-------------------|---------------------------|----------------|--------------|-------------------|------------|
| | | <u>Losses</u> | <u>Gains</u> | <u>Status Quo</u> | |
| Baseline | — | — | — | — | -16 |
| Additive | Choice | 1.59 | 1.59 | — | -45 |
| | No-Choice | — | — | — | |
| Loss Averse | Choice | 1.40 | 1.79 | — | -52 |
| | No-Choice | — | — | — | |
| Status Quo Biased | Choice | 1.44 | 1.79 | 1.3 | -51 |
| | No-Choice | — | — | — | |

References

Kass, R., & Raftery, A. (1995). Bayes Factors. *Journal of the American Statistical Association* 90, 773-795.