True and Pseudo Framing Effects

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ABSTRACT

The term "framing effect" describes the finding that people often respond differently to different descriptions or "frames" of a single situation. Framing effects violate the principle of "invariance" which states that one's decision should not be affected by how a situation is described. An important question about framing effects is whether subjects agree that two versions are equivalent. The term "framing effect" assumes that subjects would agree that the two situations were equivalent. The study reported here tests this assumption. In this study, subjects were first asked to answer framing effect problems and then were asked to compare two versions of a problem and state whether the two versions should be treated the same. In some cases such as Kahneman and Tversky's (1984) lives lost/lives saved problem, subjects treated two versions differently but reported that they should be treated the same. This is called a "true framing effect." In other cases such as Thaler's (1980) reference point problem, subjects treated the two versions differently and stated that they should be treated differently. This is described as a "pseudo framing effect." The distinction between true and pseudo framing effects has implications for both normative and descriptive theories of decision making.

INTRODUCTION

For the last 30 years, researchers have studied human decision making by comparing people's choices to utility theory, a widely accepted normative model of decision making (Savage, 1954). A growing body of research demonstrates that people's choices systematically deviate from this model (see von Winterfeldt & Edwards, 1986 for a review).

Recently, a type of violation of utility theory has been demonstrated that is much more disturbing than other violations. The term "framing effect" describes the finding that people often respond differently to different descriptions or "frames" of a single situation (Kahneman & Tversky, 1984). Framing effects violate the principle of "invariance" which states that one's decision should not be affected by how a situation is described. Clearly, the principle of invariance is fundamental to the concept of preference. While other violations of utility theory cast doubt on the descriptive accuracy of utility theory, framing effects call into question the assumption that people have well-defined preferences.

A commonly cited example of a framing effect is the "lives lost/lives saved" problem from Kahneman and Tversky (1984) (see Appendix, Problem 7). In this example, the same situation is

described either in terms of a loss (number of lives lost) or in terms of a gain (number of lives saved). Subjects are given a choice between a sure thing and a risky option. The majority of subjects choose the sure thing in the lives saved version, but choose the risky option in the lives lost version. This example demonstrates that a single situation described in two different ways can lead to different choices.

The term "framing effect" has been used in two different ways. There is a strict usage of the term that refers to pairs of situations that are objectively identical and that only differ in the way they are described. The term is also used more loosely to describe pairs of situations that are not identical but which differ in a way that is irrelevant from the perspective of utility theory.

Most research on framing effects has used a between subjects design. Although this paradigm has been useful in demonstrating the different types of framing effects that exist, it is somewhat limited. In particular, there are two questions about framing effects that have not been addressed:

1. Would a single person treat two versions of a framing effect differently? Perhaps if subjects answered both versions of a framing effect in a short period of time they would "see" the equivalence and therefore not respond inconsistently.

2. Do subjects agree that two versions are equivalent? The term "framing effect" assumes that subjects would agree that the two situations were equivalent. It suggests that different frames of the same problem lead to different choices. However, this assumption has not been tested. Given that the term has been used in the loose sense described above, it is possible that subjects do not agree that two situations should be treated the same. Specifically, subjects' intutions may conflict with utility theory about whether two situations "boil down" to the same question.

I shall use the phrase "true framing effect" to refer to the situation where a person treats two versions of a problem differently, but agrees that they should be treated the same when she directly compares them. I shall use the phrase "pseudo framing effect" to refer to the situation where a person treats two versions of a problem differently and states that they should be treated differently when she directly compares them.

The distinction between true and pseudo framing effects has implications for both normative and descriptive theories of decision making. True framing effects are evidence that the processes involved in decision making are influenced by irrelevant aspects of a problem. As several authors have pointed

out (Kahneman & Tversky, 1984; Shafer, 1986) this seriously calls into question the notion of preference. If minor changes in the presentation of a decision affect people's choices, then we feel less secure that these choices are revealing anything stable or real about people's preferences.

In contrast, pseudo framing effects are more relevant to normative theories of decision making. Pseudo framing effects demonstrate that psychologists are wrong in their assumptions about what factors should affect decisions. In particular, they would suggest that situations that are equivalent from the perspective of utility theory are not necessarily viewed as equivalent by people. The present study was designed to examine whether previously demonstrated framing effects were "true" framing effects. In addition, I was interested in seeing which, if any, framing effects would disappear using a within subject design.

METHOD

Subjects. Subjects were 31 undergraduate students enrolled in Introductory Psychology courses who participated for course credit.

Procedure. The experiment consisted of two parts. In Part I, subjects were presented with 18 decision problems on an IBM XT computer. The 18 problems consisted of 9 pairs of framing effects. The problems were presented in 2 orders. Two members of a given pair were not presented consecutively. Other problems not related to the present study were also presented.

In Part II of the experiment, subjects were presented with both members of a pair. They were then asked whether "the two situations should be treated the same way or differently."

Stimuli. Five of the pairs of framing effects were taken from previous research by Kahneman and Tversky (1984) and Thaler (1980). The other four pairs were developed for this study. All pairs used are in the Appendix.

RESULTS

The first question was whether framing effects would occur using a within subject design. On 8 out of 9 pairs, there was a significant difference in subjects' responses to the two versions of the problem (See Table 1). There was no framing effect on Kahneman and Tversky's (1984) cash discount/credit card surcharge problem. Thus, framing effects do occur in a within subject design, even when subjects answer the questions within a brief time period.

The second question of interest was whether these framing effects were "true framing effects" or "pseudo framing effects."

This analysis was qualitative. A true framing effect refers to the situation where the majority of subjects treated the members of a pair differently, but stated that they should be treated the same. In contrast a pseudo framing effect refers to the situation where subjects treat two problems differently and state that they should be treated differently. This was assessed by looking at the percentage of subjects who stated the the two versions were equivalent. There was a great deal of variation across problems on this measure (See Table 1). At one extreme was the lives lost/lives saved problem which was a true framing effect. Although 65% of subjects treated the two versions differently, only 10% of the subjects said that the two situations should be treated the differently.

Table 1. Mean responses to problems and percentage of subjects saying problems should be treated differently.

Problem	Type	Mean response Version 1 (s.d.)	Mean response Version 2 (s.d.)	% of subjects treating 1 and 2 differently	% of subjects saying 1 and 2 should be treated diff.
1	R.P.	3.8 (3.6)	2.9 (1.8)	55	60
2	R.P.	5.3 (2.7)	4.1 (3.2)	58	36
3	R.P.	6.0 (3.6)	4.2 (3.2)	80	36
4	R.P.	13.0 (11.4)	19.0 (26)	52	43
5	L/G	173 (535)	89 (89)	77	80
6*	L/G	3.0 (2.5)	3.2 (2.6)	23	0
7	L/G	4.4 (2.8)	6.4 (2.5)	65	10
8	S.C.	10.2 (11.3)	5.8 (9.0)	77	73
9	S.C.	5.8 (3.3)	4.8 (3.1)	39	23

* No framing effect demonstrated
R.P. : Reference point problem
L/G : Loss/gain type problem
S.C. : Sunk cost problem

At the other extreme was Thaler's (1980) sunk cost example (Problem 8). The question was how many times you would play tennis in the next six months if you developed tennis elbow. Seventy - seven percent of the subjects estimated a higher number of times if they had paid to join a tennis club than if they hadn't. Eighty percent of the subjects said that one's decision about whether to play should be affected by whether one had paid to join the club. That is, the majority of subjects attended to sunk costs (counter to economic theory) and the majority also stated that they believed one should attend to sunk costs. Thus, this problem was a pseudo framing effect. Thaler's (1980) reference point problem (Problem 1) was another case that was a pseudo framing effect. Fifty-five percent of the subjects treated the two versions differently and sixty percent said that they <u>should</u> be treated differently.

For the 8 problems on which a framing effect was demonstrated, there was a great deal of variation in the extent to which subjects stated that the two situations should be treated differently. Kahneman and Tversky's lives lost/lives saved example was the lowest (10%) and thus was the clearest example of a "true framing effect." Thaler's beer example was the highest percentage (90%) and an example of a "pseudo framing effect."

The problems used in this study could be grouped into three categories : reference point problems (Problems 1-4); loss/gain problems (Problems 5-7) and sunk cost problems (Problems 8-9). It is possible that some types of framing effects are true framing effects while other types are pseudo framing effects. To test this idea, I compared the mean answer to the question about whether the members of a pair should be treated differently for the three categories. The mean percentages were 43.7 for reference point problems, 30.0 for loss/gain problems and 48.0 for sunk cost problems. These differences were not significant. Thus, there is no evidence suggesting that these three categories differ with respect to the true-pseudo framing effect distinction.

DISCUSSION

This study provides evidence that framing effects differ in an important way. Some instances of framing effects are "true framing effects," that is, subjects who treat two problems differently state that that the two situations should be treated the same. Other instances of framing effects are "pseudo framing effects." Subjects treat them differently because they believe that the difference between the situations warrants different actions.

Future research might proceed in different directions for true and pseudo framing effects. An obvious question about true

framing effects is "Which way of looking at the problem is the 'right' way?" That is, if a person responds differently to two frames of a problem, and agrees that the two frames are equivalent, which way is revealing the person's true preference? In contrast, pseudo framing effects suggest that people reject certain principles of economic theory (e.g. the principle that one should ignore sunk costs). Future research might examine which principles of economic theory people reject.

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APPENDIX

For each problem, there are two versions: (1) and (2). For some of the problems, these are presented separately. For others, the text corresponds to the version (1) problem. The version (2) problem is obtained by deleting the **bold** text in version (1) and adding the text in [brackets].

Reference point problems

1. (1) You are lying on the beach on a hot day. All you have to drink is ice water. For the last hour you have been thinking about how much you would enjoy a nice cold bottle of your favorite brand of beer. A companion gets up to make a phone call and offers to bring back a beer from the only nearby place where beer is sold, **a fancy hotel** [(2) a small run-down grocery store]. He says that the beer may be expensive and so he asks you how much you are willing to pay for the beer.

2. (1) You go to a nice restaurant and notice that your favorite bottle of wine costs $5 more than it does in a liquor store.

(2) You go to a nice restaurant that doesn't have a liquor license. They charge you $5 corking fee if you bring wine to drink.

Would you **buy** [bring] the wine?
Use a number from 1 to 10 where 1 means you would definitely not buy the wine and 10 means you would definitely buy the wine.

3. (1) You go out to dinner in a nice restaurant. You order some baked clams for an appetizer and shrimp scampi for your main course. After 30 minutes, your waiter comes with the scampi and tells you that **he forgot to order your appetizer. If you want, he will order it now and you will get it in 15 minutes.**
[(2) the kitchen is really backed up and your baked clams aren't ready. If you still want them, they will be ready in 15 minutes.]

You have two options.
a. wait for it
b. cancel the order

What would you do? Use a number from 1 to 10 where 1 means you would definitely choose a and 10 means you would definitely choose b.

4. (1) Imagine that you go to purchase a jacket for $125. The jacket salesman informs you that the jacket you wish to buy is on sale for $120 at the other branch of the store.

(2) Imagine that you go to purchase a calculator for $15. The calculator salesman informs you that the calculator you wish to buy is on sale for $10 at the other branch of the the store.

How close would the other store have to be (in minutes of driving time) in order for you to make the trip to the other store?

Loss/gain problems

5. (1) Back in the 1950's you purchased a case of good wine for $5 a bottle. Today, a wine merchant offers to purchase it from you. How much would you be willing to sell a bottle for?

(2) You have just heard that a wine merchant has a case of good wine dated from the 1950's. He purchased the wine for $5 a bottle. He now wants to sell it. How much would you be willing to pay per bottle?

6. (1) You go to a gas station. They charge 90 cents a gallon for unleaded gas if you pay cash. They charge you 5 cents extra a gallon if you charge it.

(2) You go to gas station. They charge 95 cents a gallon for unleaded gas if you charge it. They give you a 5 cents a gallon discount if you pay cash.

Would you pay cash or use your charge?
Use a number from 1 to 10 where 1 means you would definitely pay cash and 10 means you would definitely use your charge.

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

If Program A is adopted, 200 people will be saved.
If Program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved.

[(2) If Program A is adopted, 400 people will die.
If Program B is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die.]

Which program would you choose? Use a number from 1 to 10 where 1 means you would definitely choose Program A and 10 means you would definitely choose Program B.

Sunk cost problems

8. (1) You have paid $300 to join a tennis club for 6 months. **During the first week of your membership, you develop tennis elbow.** [(2) You enjoy playing tennis. One day on the court, you develop tennis elbow.] It is extremely painful to play tennis. Your doctor tells you that the pain will continue for about a year.

Estimate the number of times you will play tennis in the next 6 months.

9. (1) You go out to a restaurant. The chocolate amoretto kahlua cheesecake sounds great so you order it. It is wonderful but very rich, and after two bites you are in sugar shock.

(2) You go out to a restaurant. It is the restaurant's one year anniversary and they are giving everyone free desert. You get the chocolate amoretto kahlua cheesecake. It is wonderful but very rich, and after two bites you are in sugar shock.

Would you eat more of it? Use a number from 1 to 10 where 1 means you definitely would not eat more and 10 means you definitely would eat more.