

EXPERIMENT #2 · FRAMING

Does the Way the Same Information Is Framed Affect People's Reaction to That Information?

A pilot study on attribute framing and willingness to consent

Vidit Chhajed

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Abstract

This study examines whether the way equal information is presented impacts perception of that information, extending prior framing research to an everyday online survey. Drawing on Kahneman and Tversky's framing bias, we predicted that participants shown a success-first framing will report a higher willingness-to-consent level than those shown a failure-first framing. Thirty-two participants were recruited via Reddit, Instagram, and my personal network and were randomly assigned to one of two conditions: a success-first framing (164/200 successes) or a failure-first framing (36/200 failures). Each participant was given identical information except if the successes or failures were highlighted. After that, they were asked how likely they would be to saying yes to having that surgery performed on them. A one-tailed Welch's independent samples t-test revealed a statistically significant difference in mean willingness-to-consent levels between the two groups ($t = 2.507$, $df = 25.06$, $p = .0096$), with the success-first group reporting a mean willingness-to-consent level of 8 compared to 6 in the failure-first group. Effect size was large (Cohen's $d = .897$), and a 95% confidence interval for the difference in means excluded zero (0.357, 3.643), further confirming the result. These findings are consistent with framing bias and prior work by Levin and Gaeth (1988), suggesting that the way identical attributes are described (75% lean vs 25% fat) has a significant effect on how favorable they are rated even after both products are consumed. Limitations of this study, including small sample size and convenience sampling, are discussed alongside directions for future research.

Introduction

When someone receives information, they usually don't tend to think deeper on what the information objectively means, but rather develop judgements simply based on what is presented to them. This is the framing bias, first formally identified by Tversky and Kahneman in 1981. They showed that identical information being presented with the positive aspect vs negative aspect highlighted can significantly impact decision making. Simply put, your brain latches onto whatever it's explicitly told, not what's implied in a hidden fashion.

Levin and Gaeth (1988) demonstrated how consequential this effect can be in the real world. Regular grocery store consumers were shown two ground beefs, one labelled 75% lean, and another labelled 25%. They then made participants taste both products themselves, and then give each a rating. The beef labelled 75% lean received significantly higher ratings, even though both tasted identical. This proves that the labelling of a product can significantly impact judgement to an extent that even direct sensory experiences can't override.

Most prior framing bias research has relied on controlled lab settings or professional populations. This study tests the effect on everyday people (mostly teenagers) via an online survey, asking whether the way a surgeon's success rates is framed affects a general sample's willingness to consent to that surgery. If framing bias holds, participants shown a success-first framing should report a significantly higher willingness-to-consent level than those shown a failure-first framing, even though both are technically the same information.

Research Question

Does the way the same information is framed affect people's reaction to that information?

Hypothesis

Respondents shown the success-first framing will report a higher willingness-to-consent level, on average, than those shown a failure-first framing, consistent with Levin and Gaeth's (1988) attribute framing bias.

Method

Participants were given a hypothetical situation of requiring knee surgery and were shown a doctor's recent surgery history for that procedure. In both groups it was implied that there were 164 successes and 36 failures, but only one of the pieces of information was explicitly stated.

Group 1 saw this text:

You have a chronic knee condition, and your friend, a licensed physician, has offered to treat it surgically for free. Of every 200 procedures he has historically conducted, 164 are successes, with patients reporting a recovery of mobility within six months. How likely would you be to say yes to having this surgery performed on you?

Group 2 saw this text:

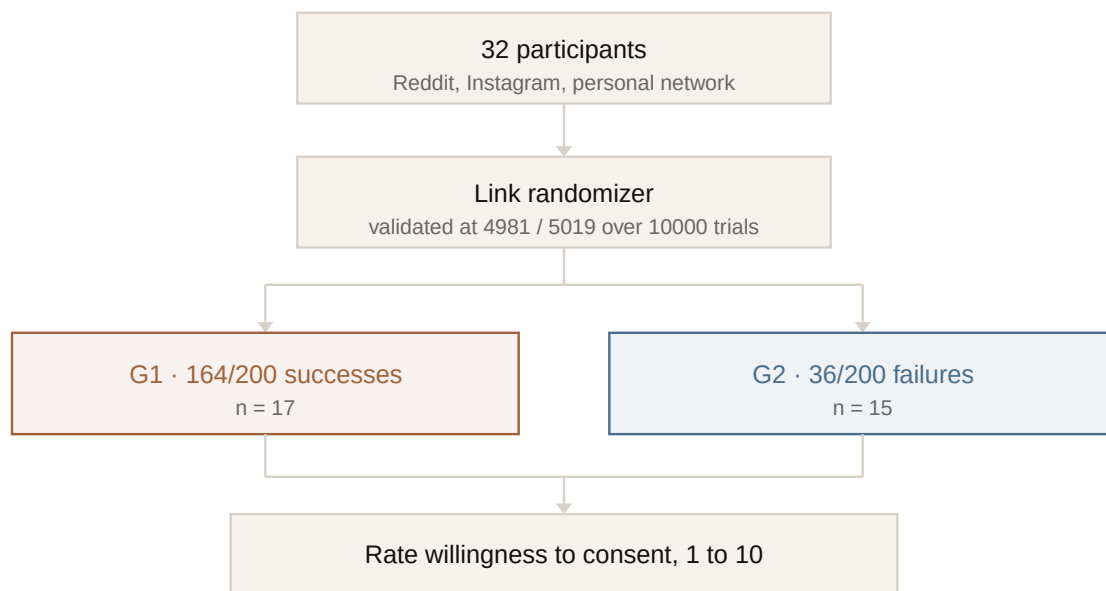
You have a chronic knee condition, and your friend, a licensed physician, has offered to treat it surgically for free. Of every 200 procedures he has historically conducted, 36 are failures, with patients reporting no recovery of mobility within six months. How likely would you be to say yes to having this surgery performed on you?

The study used two between-subjects treatment conditions. Participants in the success-first condition were told the doctor has 164 successes in his past 200 surgeries. Participants in the failure-first condition were told the doctor has 36 failures in his past 200 surgeries. Then all participants were asked to rate how likely they would be to say yes to having the surgery performed on them on a scale from 1-10. Participants were randomized to treatments via a link randomizer which I designed. It essentially takes 2 links as inputs and randomly redirects to one of the two links. While testing the randomizer with $n = 10000$, I got 4981 redirects leading to link 1 and 5019 leading to link 2, essentially confirming the tool works properly, and any variance is random.

The survey ended with 32 participants that were recruited via Reddit posts (adhering to sub-reddit guidelines), an Instagram reel, and my personal network. All participants ended up receiving informationally-equivalent descriptions; the only manipulated variable was which piece of information was explicitly stated and which was implied.

Figure 1

Study design and treatment assignment.



Note. The two conditions differ in a single clause. Every other word of the vignette is identical.

Results

G1 = group shown 164/200 successes. G2 = group shown 36/200 failures.

Table 1

Descriptive statistics for willingness-to-consent ratings by framing condition.

	G1 (164/200 successes)	G2 (36/200 failures)
Mean	8	6
Median	9	6
Standard deviation	1.837	2.563
Range	8	8
IQR	1.5	4
n	17	15
Outliers	1 outlier, value 2	None

Note. Outliers identified using the 1.5 x IQR rule. Ratings were collected on a 1-10 scale.

Hypotheses and Test

H_0 : There is no difference in mean willingness-to-consent levels between the success-first and failure-first group. $\mu_1 = \mu_2$

H_1 : Mean willingness-to-consent levels will be higher for the success-first group than the failure-first group. $\mu_1 > \mu_2$

Alpha Level: .05

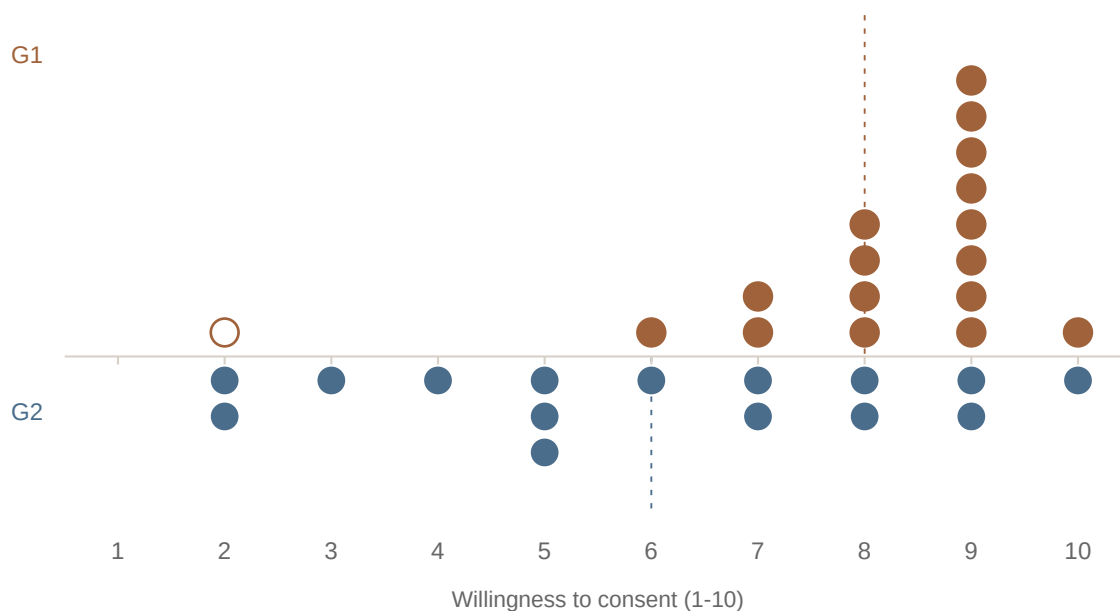
Name: one-tailed Welch's independent samples t-test

Conditions

1. Random: Subjects weren't randomly chosen, rather it was a voluntary sample with some elements of a convenience sample. However, participants were randomly assigned to a treatment via a random link redirector, leading to a 17-15 split
2. 10%: Easily met, $n = 15$ and $n = 17$ is much lower than 10% of all potential knee surgery patients
3. Normal: Both plots show somewhat symmetric distributions with no severe skew (except 1 outlier), supporting the normality condition well enough to proceed

Figure 2

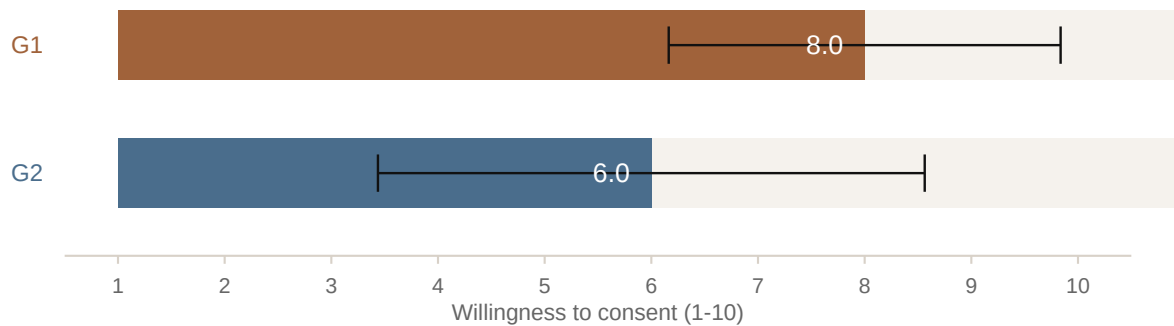
Distribution of willingness-to-consent ratings by condition.



Note. G1 stacks above the axis, G2 below. The hollow marker in G1 is the single low outlier at 2. Dashed verticals mark each group mean.

Figure 3

Mean willingness to consent by condition, with error bars showing plus or minus one standard deviation.



Test Statistic

$t = 2.507$ with $df = 25.06$

$p = .0096$

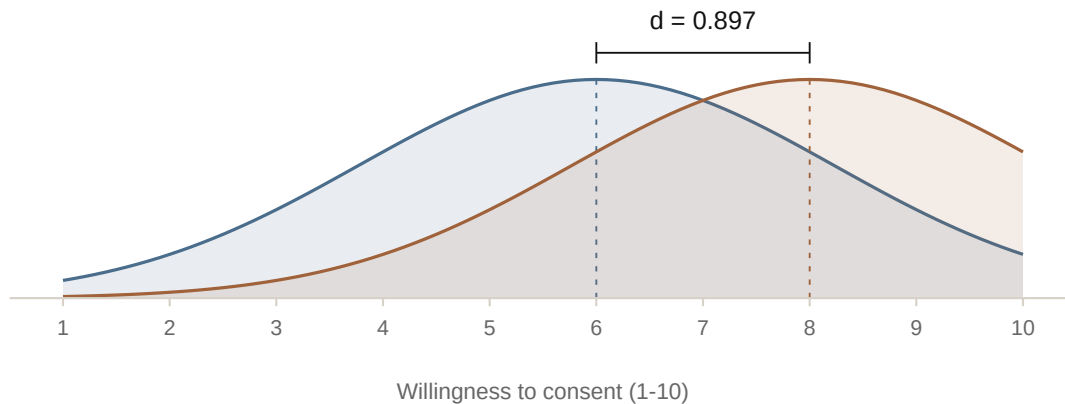
Since the calculated p value of .0096 is less than our stated alpha level of .05, we reject the null hypothesis. We found statistically significant evidence to suggest that the group given the 164/200 successes framing reported a higher confidence estimate than the group given the 36/200 failures framing, consistent with framing bias.

Practicality

To assess the practical significance of the result, Cohen's d was calculated using the means and standard deviations of both groups. Cohen's $d = 0.897$ using average variance formula (unpooled), which indicates a large effect by Cohen's (1988) conventions (small = 0.2, medium = 0.5, large = 0.8). This suggests that the difference in willingness-to-consent levels between the two framing groups was not only statistically significant but also practically meaningful. The framing had a strong influence on participants' responses, not just a statistically detectable one.

Figure 4

Effect size. The two conditions separated by 0.897 standard deviations.



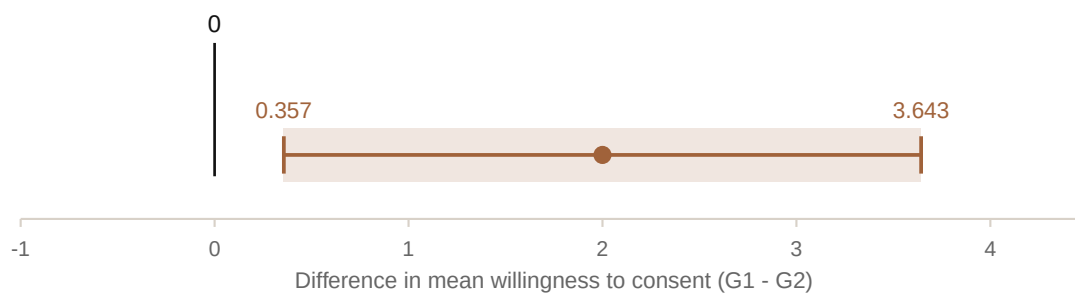
Note. Curves are drawn using the unpooled average-variance standard deviation on which Cohen's d was calculated.

Confidence Interval

A 95% confidence interval for the difference in mean willingness-to-consent levels ($G1 - G2$) was calculated as (0.357, 3.643). This means we are 95% confident that the true difference in mean confidence values between the success-framing and failure-framing groups falls between 0.357 and 3.643. 0 not being included within our interval is consistent with our decision to reject the null hypothesis.

Figure 5

95% confidence interval for the difference in mean willingness to consent.



Note. The interval lies entirely above zero.

Discussion

My findings support the hypothesis. The group shown the success-first framing reported a mean willingness-to-consent level of 8, while the group shown the failure-first framing reported a mean willingness-to-consent level of 6. Both pieces of information technically conveyed the exact same thing, yet we found significant evidence that people used what was explicitly stated as a reference when considering if they'd take the surgery or not.

My findings are consistent with what Tversky and Kahneman found in 1981. They argued that the way identical information is framed can significantly impact the way the audience perceives that information. 164/200 successes implied 36/200 failures, and vice versa, yet the group shown the former was much more likely to consent to the surgery than the group shown the latter.

The findings also connect to Gaeth and Levin's 1988 grocery store experiment. Average consumers rated a 75% lean ground beef product significantly higher than a 25% fat ground beef product, even after tasting both products. My survey mirrors this. A willingness-to-consent level for surgery was higher when people were shown a success-first framing, suggesting the framing bias is robust across different asset types and contexts.

The real-world implications span a lot of domains. In marketing, experts make sure to highlight positive outcomes, and leave the negative outcomes up to interpretation. In court, lawyers will highlight the things that defend the client, while merely implying the things that work against their client. While hiring, companies will highlight all the paid leaves offered, while the number of days you are forced to work is left to the applicant's calculation. In a casino, the profit rate on a certain game will be highlighted, while the losses rate will require some calculations.

These are all examples where consumers have to exercise extra mental effort to discern the negative outcomes, whereas the positive outcomes are prominently stated. These are framing bias in action.

Limitations

1. If someone with surgery history answered the survey there would be no way for me to detect it. Their knowledge would likely change the effect of the framing, but I can't track that.
2. If anyone took the survey twice and saw both treatments, it could contaminate responses.
3. Because my Instagram account is framed as a behavioral economics account, and I posted in Reddit forums like r/behavioraleconomics along with more general subreddits like r/sample-size and r/takemysurvey, some participants likely went into the survey already expecting some kind of psychological trick.

Future Direction

Ways this experiment could be improved are as follows. My sample size needs to be substantially larger, ideally upwards of 100 participants per group to improve statistical power and allow for more reliable replication. I would add a control group shown a table which includes both the 36 failures and 164 successes, seeing what willingness-to-consent levels look like when exposed to both pieces of information. Future directions to go deeper could include testing till what percentage framing bias holds up (chances are at 50% failure and success rates it won't do much), ask people to identify the “hidden” number, and see if the framing bias still affects them, and test debiasing strategies like showing both to see how to combat framing effect.

References

- Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum Associates.
- Levin, I. P., & Gaeth, G. J. (1988). How consumers are affected by the framing of attribute information before and after consuming the product. *Journal of Consumer Research*, 15(3), 374–378.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453–458.