

The Attitude-Behavior Discrepancy in Medical Decision Making

Fei He^{1,*}; Dongdong Li²; Rong Cao¹; Juli Zeng³; Hao Guan⁴

¹School of Public Management, Northwest University, Xian, China

²Brigade of Cadets, Fourth Military Medical University, Xian, China

³Department of Psychology, Officer's College of the Chinese People's Armed Police Force, Langfang, China

⁴Department of Burns and Cutaneous Surgery, Xijing Hospital, Forth Military Medical University, Xian, China

*Corresponding Author: Fei He, School of Public Management, Northwest University, Xian, China. Tel: +86-2976397654, Fax: +86-2984664724, E-mail: hefei@nwnu.edu.cn

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Background: In medical practice, the dissatisfaction of patients about medical decisions made by doctors is often regarded as the fuse of doctor-patient conflict. However, a few studies have looked at why there are such dissatisfactions.

Objectives: This experimental study aimed to explore the discrepancy between attitude and behavior within medical situations and its interaction with framing description.

Patients and Methods: A total of 450 clinical undergraduates were randomly assigned to six groups and investigated using the classic medical decision making problem, which was described either in a positive or a negative frame (2) × decision making behavior (attitude to risky plan | attitude to conservative plan (3)).

Results: A discrepancy between attitude and behavior did exist in medical situations. Regarding medical dilemmas, if the mortality rate was described, subjects had a significant tendency to choose a conservative plan ($t = 3.55$, $P < 0.01$) yet if the survival rate was described, there was no such preference ($t = -1.48$, $P > 0.05$). However, regardless of the plan chosen by the doctor, the subjects had a significant opposing attitude ($P < .05$). Framing description had a significant impact on both decision making behavior and attitude ($t_{\text{behavior}} = -3.24$, $P < 0.01$; $t_{\text{attitude to surgery}} = 4.08$, $P < 0.01$; $t_{\text{attitude to radiation}} = -2.15$, $P < 0.05$).

Conclusions: A discrepancy of attitude-behavior does exist in medical situations. The framing of a description has an impact on medical decision-making.

Keywords: Attitude; Behavior; Patient

1. Background

In everyday life, each individual may have a different attitude towards the decisions made by others, which may be supporting or opposing. Plenty of researches in social psychology have demonstrated the discrepancy between attitude and behavior (1-3). For example, someone may judge option A as better than option B, yet still choose option B when making decisions for himself. People may oppose racial discrimination, yet still reject to sit near a black man. In medical practice, the dissatisfaction and complaint of patients and their relatives about medical decisions made by doctors is often regarded as the fuse of doctor-patient conflict (4). However, a few studies have investigated the reasons behind such dissatisfactions. Framing effect refers to the change of decision making when the same problem is presented with different information. The 'Asia Disease' problem is a classic example: imagine that a government was preparing for an outbreak of an Asian disease that was expected to result in 600 deaths. Two sets of rescue plans were proposed: plan A that could save 200 people (400 deaths), and plan B that had a 1/3 probability that all 600 people would be saved (no deaths) and 2/3 probability that no one would be saved (all dead). When the problem was described in a

positive frame (life saved), 72% of the participants chose plan A; yet, when described in a negative frame (death), 78% chose plan B (5). In the past 30 years, framing effect has been considered as a key issue in behavioral decision making research (6). Studies have shown that the framing effect is a stable and robust phenomenon in economics, lifesaving, resource allocation, and management decision-making among others (7-10). Considerable studies have also reported that the framing effect stably exists in medical situations. For example, Gerend and Cullen informed participants about the benefits of alcohol abstinence or about the harm of continuing alcohol abuse; the authors found the dissuasive effect was better when a positive frame was used instead of a negative frame (11). Armstrong et al. randomly assigned participants in to one of three groups; each group was presented with information about two treatment programs. For one of the groups the description of the two treatments involved only mortality curves. For the second group, only survival curves were presented. The third group was shown both survival and mortality curves. The results indicated that participants who received only mortality curves were significantly less likely to prefer preventative surgery than

participants from the other two groups (12). Peng et al. distinguished five types of framing effects in medical situations and compared their effect sizes (13). However, prior studies mainly concerned the impact of framing description on decision making behavior. There are no present reports investigating whether such “framing effects” also influence attitude.

2. Objectives

In the current study, we preliminarily explored the impact of framing description on the attitude of patients' relatives to doctors' medical decision-making and confirmed whether the attitude-behavior discrepancy also existed in medical situations.

3. Patients and Methods

3.1. Participants

The participants included 450 undergraduates majoring in clinical medicine from a medical university in China who agreed to take part in the study for extra course credit and a ball pen as a gift. The participants had a mean age of 18.75 years ($SD = 1.04$). We distributed 450 inventories and collected 437 valid inventories for a valid recovery rate of 96.19%. Among the valid samples, there were 91 female (20.8%) and 286 male (79.2%) participants. All participants provided a written informed consent be-

fore completing the measures. The research described in this paper is in accordance with the ethical guidelines of the Northwest University of China and has been approved by the ethics committee of this university (NO. 20130142). Moreover, the research was conducted in adherence to the legal requirements of the People's Republic of China. The data was collected in Xi'an, China, from July 4th to July 5th.

3.2. Materials

We adapted the research material from the classic medical decision-making problem of the Adult Decision-Making Competence inventory (14). This problem describes a situation, in which the decision maker should make a choice between having surgery or radiation therapy. The surgical treatment has a lower treatment survival rate (50%), yet a relatively higher 5-year survival rate (40%); while the radiation therapy has a higher treatment survival rate (100%), but a lower 5-year survival rate (20%). The participants were informed about the outcome of the two alternative treatment programs using descriptions including either the survival rates or the mortality rates. The problems were also described as making decisions (behavior) and attitude of surgery or radiation-therapy treatment (see Table 1).

A between-subject design was used. Subjects were randomly divided into six groups using a computer-generated randomization schedule based on their study number. We randomly assigned participants to one

Table 1. Research Materials

	Positive Frame	Negative Frame
Decision making behavior	Imagine that one of your relatives was diagnosed with a cancer that must be treated. His choices are as follows: 1) Surgery: of 100 people having surgery, 50 live through the operation, and 40 are alive at the end of five years. 2) Radiation therapy: of 100 people having radiation therapy, all live through the treatment, and 20 are alive at the end of five years. Which treatment would you like to choose?	Imagine that one of your relatives was diagnosed with a cancer that must be treated. His choices are as follows: Surgery: of 100 people having surgery, 50 die because of the operation and 10 of the 50 survivors die by the end of five years. Radiation therapy: of 100 people having radiation therapy, none die during the treatment, and 80 die by the end of five years. Which treatment would you like to choose?
Attitude towards treatment via surgery	Imagine that one of your relatives was diagnosed with a cancer that must be treated. His choices are as follows: Surgery: of 100 people having surgery, 50 live through the operation, and 40 are alive at the end of five years. Radiation therapy: of 100 people having radiation therapy, all live through the treatment, and 20 are alive at the end of five years. If the doctor decides to choose surgery treatment, what do you think of his decision?	Imagine that one of your relatives was diagnosed with a cancer that must be treated. His choices are as follows: Surgery: of 100 people having surgery, 50 die because of the operation and 10 of the 50 survivors die by the end of five years. Radiation therapy: of 100 people having radiation therapy, none die during the treatment, and 80 die by the end of five years. If the doctor decides to choose surgery treatment, what do you think of his decision?
Attitude towards treatment via radiation-therapy	Imagine that one of your relatives was diagnosed with a cancer that must be treated. His choices are as follows: Surgery: of 100 people having surgery, 50 live through the operation, and 40 are alive at the end of five years. Radiation therapy: of 100 people having radiation therapy, all live through the treatment, and 20 are alive at the end of five years. If the doctor decides to choose radiation-therapy treatment, what do you think of his decision?	Imagine that one of your relatives was diagnosed with a cancer that must be treated. His choices are as follows: Surgery: of 100 people having surgery, 50 die because of the operation and 10 of the 50 survivors die by the end of five years. Radiation therapy: of 100 people having radiation therapy, none die during the treatment, and 80 die by the end of five years. If the doctor decides to choose radiation-therapy treatment, what do you think of his decision?

of six groups based on the grid of two frames (positive or negative) by three responses (making decisions for relatives, attitude towards surgery treatment, or attitude towards radiation-therapy treatment). Responses to the decision-making problem were made on a 6-point Likert scale ranging from one (representing surely selecting the surgery program or strongly opposing the doctor's decision) to six, (representing surely selecting the radiation therapy program or strongly supporting the doctor's decision). As with a simple dichotomous scale where a participant would choose one of the two treatments, participants using a 6 point-scale must also favor one procedure over the other since there is no mid-point. In addition, the 6-point scale allowed us to determine the strength of the choice preference (14). Participants were told there is no right or wrong answer, the answers were kept anonymous and there was no time limit. Data analyses were performed with using the SPSS software, version 16.0. In the current study χ^2 test, one-sample t test and independent t test were all used. A P value of < 0.05 was considered statistically significant.

4. Results

4.1. The Descriptive Statistics of Decision Making Behavior-Attitude in Positive-Negative Frames

In order to verify that the proportion of males to females was the same in all six conditions we conducted a Chi-square test and found no significant difference ($\chi^2_{5, 377} = 2.597, P = 0.76$). Table 2 describes the mean response for both decision-making behavior and attitude of the participants from the six groups. We tested the mean response in each cell against a score of 3.5, the theoretical mean score of the 6-point Likert scale, using the one sample t-tests. The t-tests demonstrated that in general, when the problem was described in terms of survival rate, the participants had no significant preference for

either surgery or radiation-therapy treatment ($t_{64, 65} = -1.09, P = 0.28$). When described in terms of mortality rate, the participants significantly chose radiation-therapy treatment ($t_{64, 65} = 3.55, P < 0.01$). However, no matter how the problem was described or which treatment the doctor chose, the patients tended to significantly oppose the doctor's decision ($P < 0.05$). Practically speaking, we observed that there was no preference for surgery or radioactive treatment when making a decision in a positive frame. If attitude was in accordance with behavior, there should be no significant support or opposition, when participants were told that the doctor had decided to choose surgery or radioactive treatment. However, the results indicated that the participants significantly opposed the doctor's decision in a positive frame, regardless of what the doctor chose ($t_{\text{attitude to surgery}} = -3.01, P < 0.05$; $t_{\text{attitude to radiation}} = -6.67, P < 0.01$). Analogously, since the participants were significantly more willing to choose radioactive treatment in a negative frame, they should have opposed when told that the doctor had decided to choose surgery treatment and supported when told that the doctor had chosen radioactive treatment, if attitude was in accordance with behavior. However, the results indicated that the participants significantly opposed the doctor's decision in a negative frame, no matter which treatment the doctor decided to choose ($t_{\text{attitude to surgery}} = -10.77, P < 0.01$; $t_{\text{attitude to radiation}} = -3.43, P < 0.01$).

4.2. The Framing Effect of Decision Making Behavior and Attitude

Figure 1 describes the impact of frame description on decision-making behavior and attitude. The results indicated that there was a significant framing effect in medical decision-making behavior ($t_{128, 130} = -3.24, P < 0.01$). Framing description also influenced the attitude of participants to both surgery ($t_{108, 56, 124} = 4.08, P < 0.01$) and radioactive treatment programs ($t_{121, 123} = -2.15, P < 0.05$).

Table 2. Sex Structure and Decision Making Among the Six Groups ^a

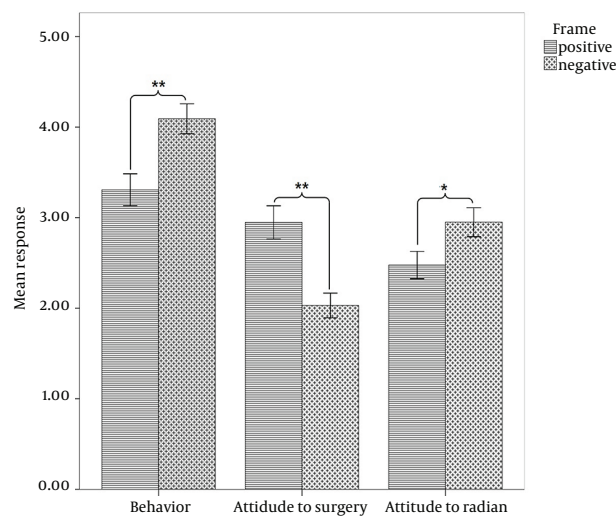
Attitude-behavior	Male	Female	Response	t
Positive				
Behavior	46 (70.8)	19 (29.2)	3.31 $\pm$ 1.42	-1.09
Attitude to surgery	48 (82.8)	10 (17.2)	2.95 $\pm$ 1.39	-3.01 ^b
Attitude to radiation	48 (76.2)	15 (23.8)	2.48 $\pm$ 1.20	-6.76 ^c
Negative				
Behavior	46 (70.8)	19 (29.2)	4.09 $\pm$ 1.33	3.59 ^c
Attitude to surgery	50 (75.8)	15 (24.2)	2.03 $\pm$ 1.11	-10.77 ^c
Attitude to radiation	46 (76.7)	14 (23.3)	2.95 $\pm$ 1.24	-3.43 ^c

^a Data are presented as No. (%) or Mean $\pm$ SD.

^b $P < 0.05$.

^c $P < 0.01$.

Figure 1. The Impacts of Framing Description on Medical Decision Making Behavior and Attitudes to Decisions Made by Others



Data presented as Mean $\pm$ SE

5. Discussions

The current study demonstrated that an attitude-behavior discrepancy existed in medical situations, and framing description could not only influence people's decision-making behavior, but also their attitudes to the decisions made by others. Participants who had received a description including survival rates were more inclined to risky surgery treatment, compared with those presented with mortality rates, which is consistent with many previous studies (12, 15, 16). This effect is because when participants consider treatment options based on survival rates they may have regarded them as an opportunity rather than as a threat. While when given mortality information alone, this may have focused their attention on the threat of death. Numerous studies have indicated that when decision makers perceive opportunities more than threats, they are more inclined to take risks. In contrast, when they perceive more threats than opportunities, they are more conservative (17-19). This study mainly proved the existence of attitude-behavior discrepancy in medical situations. If the problem was described with survival rates, the participants had no preference for either surgery or radioactive treatment when making medical decisions for their relatives. It was logically easy to infer that people should neither support nor oppose either of the two treatments. However, the results showed that participants had a uniformly negative attitude, no matter which available treatment option was chosen. Likewise, the participants had a significant preference for radioactive treatment over surgery when making medical decisions for relatives, when the description had a negative frame. If attitude was always in accordance with behavior,

people should have supported doctors to take on radioactive treatment. However, the results indicated that participants still opposed doctors' decisions, regardless of which available treatment option was chosen. There is a discrepancy between behavior and attitude, which is in line with prior reports (1-3). This effect may be caused by the automatic subjective aversion to the decisions made by others. In addition, people are not likely to take risks and responsibilities of supporting one of the available treatment programs. When decisions are made, opposition is always safe and not responsible. The results of the current study reflect the truth to some extent. In medical practice, dissatisfaction and complaints from patients and their relatives may not necessarily be because these decisions are not suitable, as patients and their relatives may oppose all available treatment programs. Based on the results of the current study, it can be concluded that the current policy, according to which critical medical decisions should be made by patients and their relatives, is an appropriate measure as it reduces medical-patient conflict and the stress place on medical professionals.

Authors' Contributions

Study concept and design: Fei He and Hao Guan. Analysis and interpretation of data: Hao Guan. Drafting of the manuscript: Fei He and Hao Guan. Critical revision of the manuscript for important intellectual content: Fei He, Dongdong Li, Rong Cao, Juli Zeng and Hao Guan. Statistical analysis: Fei He and Hao Guan.

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