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The Trolley Problem revisited. An exploratory study

Abstract

Recent studies by cognitive scientists demonstrate that people's choices are more complex than the image provided by rational choice theory, and consistency of choice is not a characteristic to be expected in real-life situations. This exploratory paper attempts to isolate three variables in relation to decision making. Working with a sample (N=70) of university students in the U.S, and using the three variants of the Trolley Problem, the subjects' responses are used to identify the similarities and differences based on the three dimensions. The participants were asked to respond to three hypothetical situations regarding a runaway trolley. Their decision in the first scenario could save a person's life or let him be run over by the trolley. In the second scenario, their decision could either let one person die and save five lives or save one life and let five people be killed. These two scenarios require pulling a lever to switch the trolley from one track to another. The third scenario requires pushing an obese person in front of the runaway trolley to stop it from killing five persons. The paper presents the findings on the three variables: gender, age, and relational status.

Keywords: decision making, Trolley Problem, inconsistency of choices

JEL Classification: D91, Z13

1. Introduction

Regardless of the numerous differences between the research approaches in economics and ethics, both disciplines investigate the process of decision making and both groups build on, and benefit from the assumption that human choices are consistent. Simply stated – the economists presuppose that if a person prefers apples over bananas, she should always choose an apple, not a banana when both fruits are available. The ethicists presume that if a person's deeds are to be governed by a given ethical doctrine, she should always behave in the same way under the same conditions.

Recognizing or defining the main criterion governing human choices – be it a pursuit of goodness, peace of mind, utility or profit – has been a prerequisite for building a coherent theory explaining people's behavior or establishing the normative system regulating human deeds.

Recent studies by cognitive scientists demonstrate, however, that in practice, people's choices are more complex and consistency of choice is not a characteristic to be expected in real life situations. What is more, the inconsistency of choices can also be observed in the laboratory experiments where the complexities of life are artificially reduced (cf. for instance: Tversky & Kahneman, 1974; Prelec & Loewenstein, 1991; Baron 1994; Greene et al., 2001; Greene & Haidt, 2002).

One of the frequently discussed experiments requiring analytical thinking and decision making that demonstrates the inconsistency of moral choices is the Trolley Problem introduced to the ethical and social science literature by a British philosopher, Phillipa Foot (1967) and elaborated by Judith Jarvis Thomson (1976; 1985). Building on their reasoning, we carried on an empirical study to contribute to the discussion by investigating the relationship between the (in)consistency of choices and gender, age and marital status.

2. The Trolley Problem

The thought-experiment, known as the Trolley Problem, refers to the imaginary situation in which one is supposed to imagine performing the role of a trolley driver.[1] On the track in front of her, she sees that there are five workers repairing the track. Unfortunately, the trolley brakes are jammed and as the trolley charges down the steep hill, there is no chance to stop the trolley. At the last moment the driver sees a spur track to one side and realizes that the trolley may be turned to it to save five lives. However, there is one worker repairing the spur track. The question posed by Foot (1967, pp. 10–11) and repeated by several subsequent scholars was: Is it morally right for the driver to turn the trolley and kill one worker instead of letting five workers die?

[1] In the original paper Foot talked about a runaway tramway. The version of this experiment presented in this paper, stems from the classic article on this topic by Judith Jarvis Thomson (1976, p. 206; cf. Thomson, 1985, pp. 1395–1396).

The situation described above was comparable to another, somewhat similar, experiment. There are five patients waiting for different organs at a hospital at a given moment. As it happens, a young man arrives for his annual check-up. His organs can be a perfect match for all five patients waiting for an organ donor. Imagine that you (the subject in the laboratory experiment) are an extremely gifted (and lucky) surgeon with a one-hundred percent success rate with organ transplants, i.e., no organ that you transplanted was ever rejected by the recipient. In this case, the question is whether one should scarify one perfectly healthy person, take his life, and save five other persons (Thomson, 1976, pp. 205–206; cf. Thomson, 1985, p. 1395).

In both cases, the choice seems to be the same: saving several people at the "cost" of killing one. Yet, the typical reactions of the respondents in these two situations are different (cf. Lanteri, Chelini & Rizzello, 2008), whereas they are prone to save the five in *Trolley Driver* case, they are strongly against choosing the same option in *Organ Transplant* scenario.

Numerous subsequent variations of the same problem were pictured by Judith J. Thomson (1976; 1985) who proposed, for instance, to modify *Trolley Driver* case by making an assumption the decision maker was not the driver but a bystander who could turn a lever to divert the trolley. Such a version, introduced to increase neutrality of an agent, was named *Bystander at the Switch* (Thomson, 1985, p. 1397). This scenario is commonly regarded as the standard trolley problem (cf. for instance: Singer, 2005, p. 339)

Another variant – *Fat Man* – moves a decision maker to a footbridge over a trolley track. The trolley moves towards the group of five workers, as before. However, in this case, the only chance to stop the trolley and save the workers is to put a massive object in the path of the trolley. Conveniently, an excessively overweight person is standing at the same footbridge, leaning over the railing looking at the trolley. If pushed over, the obese person's body mass would stop the trolley. As in the previous experiments, the options are to save five lives by scarifying one or to refrain from acting and witnessing the five persons' death (Thomson, 1976, pp. 207–208; 1985, p. 1409).[2]

There are strong parallels between *Trolley Driver* and *Bystander at the Switch*, and between the *Organ Transplant* and the *Fat Man* scenarios. The respondents are confronted with choices that put reason against emotions.

3. The study

In the philosophical debates about the Trolley Problem, the main issue has been to provide an explanation why the common responses of the people in the two confronted cases are different or to justify their intuitive reactions. However, as Peter Singer rightly

[2] In 1944, when the Germans began the bombing of London, the British intelligence, through their spy-network, fed misinformation to the Germans by telling them that the "worthwhile" targets were in the southern part of the city. By sacrificing some, it is estimated that 10,000 lives were saved. Along the same lines, it is argued that by dropping the nuclear bombs over Japan brought a quick end to the war and saved many more lives than were lost in Hiroshima and Nagasaki (Bakewell, 2013). It is a macabre coincidence that the atomic bomb dropped on Nagasaki was nicknamed *The Fat Man*.

noted, "every time a seemingly plausible justifying principle has been suggested, other philosophers have produced variants on the original pair of cases that show that suggested principle does not succeed in justifying our intuitive responses" (2005, p. 340). Our research is conducted from a slightly different perspective. Instead of making attempts to provide certain acceptable reasons for such inconsistency of people's choices, our goal was to identify the variables that may be responsible for the differences in people's decision making.

3.1. Instrument and the sample

In our study, we employed two versions of the Trolley Problem: *Bystander at the Switch* and *Fat Man*. The only difference between the Thomson's descriptions and ours was that the workers were replaced by the anonymous persons tied to the tracks that are unable to escape. Such a modification was introduced to eliminate the questionnaires filled in with the answer as: "I would try to shout at the workers to warn them and make them run away."

Additionally, we constructed the third scenario that may be named as *Ill-informed Bystander at the Switch*. In this case, the trolley is moving down the hill and a person is tied to the track. A bystander close to the lever switch can easily change the trolley' path diverting the trolley to the empty spur. We expected to receive all the responses in favor of switching the lever. The obvious choices were to save a person or to let her die without any noticeable "price" to pay. The respondent knows neither where the empty track leads nor what might lay ahead. This scenario was presented to the respondents as the first. It was followed by *Bystander at the Switch* and *Fat Man*.

Instead of a verbal description, we used pictures to demonstrate the scenarios. The respondents were shown the first sketch and were asked to record their response on a notecard. Then, they were shown the second sketch and asked to write their response. Finally, they were shown the third sketch and asked to write their response. The respondents were neither allowed to go back and change their responses nor permitted to discuss the scenarios with other participants.

The study was conducted on a mid-size, state-supported American university with a 96% Hispanic-American population. Since there was cultural homogeneity in the sample, we argue that the influence of culture was controlled. The three variables used for the analysis were gender, age, and marital status. The sample consisted of 70 participants, of which:

- 29 (41%) were males and 41 (59%) females,
- 33 (47%) were 20 years old or younger, 37 (53%) were 21 years old or older,
- 45 (64%) were single, the remaining 25 (36%) were either in a relationship or married.

All the participants were pursuing undergraduate studies in Communication and Journalism.

3.2. Data and results

To our amazement, in the first scenario, only 55 (64%) of the respondents declared that they would pull the lever to save the person's life. 25 out of 70 persons decided that they would have refrained from making any necessary effort to switch the lever.

In making a choice between saving five people versus one in the second scenario, i.e. *Bystander at the Switch*, 87% chose to save five lives and sacrifice one. In other words, 62 persons said they would divert the trolley to the spur with one person tied to it and save the five tied to the main track.

According to our expectations and the previous research, in the case of the *Fat Man* scenario, the share of those willing to push the man down was smaller than in the second scenario. In this case, only 43 respondents (61%) declared they would push the man to stop the trolley and save the people on the track.

The results we received for the subsamples distinguished by gender, age and marital status of the respondents are presented in the sections below.

3.2.1. Gender

The data suggest a trend that females are more likely to take action to save a person's life than males; however, the difference based on gender is statistically not significant. Table 1 presents the breakdown based on gender.

Table 1. Results of *Ill-informed Bystander at the Switch* scenario for males and females

	Pull the lever to save a person (percentages of males/females)	**Will not pull the lever (percentages of males/females)**
Males	17 (59%)	12 (41%)
Females	28 (68%)	13 (32%)
Σ	45	25

The chi-square statistics is 0.6921, the p-value is 0.4054. This difference is not significant.

Once the respondents have more information, in making a choice between saving five people versus one, 87% of the respondents chose to save five lives and sacrifice one. The agreement among men and women was the highest of the three scenarios. The difference between the two groups was statistically not significant. The results are presented in Table 2.

In the third scenario, the difference between men and women was not statistically significant, too. However, in this situation, 27 (39%) of the respondents refused to push the person over.

For the overall sample, the results for the third scenario (Table 3), were similar to the first one (Table 1). The decision to refrain from acting was said by 61% in the former and 64% in the latter case. However, whereas in the *Ill-informed Bystander at the Switch* case females were more eager to pull the lever, in the *Fat Man* scenario the women were more hesitant to act.

Table 2. Results of *Bystander at the Switch* scenario for males and females

	Pull the lever to save five persons and sacrifice one (percentages of males/females)	**Will not pull the lever (percentages of males/females)**
Males	25 (86%)	4 (14%)
Females	37 (90%)	4 (10%)
Σ	62	8

*The chi-square statistics is 0.2735. The p-value is 0.6010. This result is **not** significant.*

Table 3. Results of *Fat Man* scenario for males and females

	Push down one man to save five (percentages of males/females)	**Will not push the man (percentages of males/females)**
Males	19 (66%)	10 (34%)
Females	24 (59%)	17 (41%)
Σ	43	27

*The chi-square statistics is 0.3493. The p-value is .5545. The result is **not** significant.*

3.2.2. Age

The average age of the sample was 20.14 years. The sample was divided into two age groups: 20 years old or younger, and, 21 years or older. Among our sample, 33 (47%) participants fell into the younger age group, and the remaining 37 (53%) were 21 years old or older.

In the case of acting to save a life or not to interfere (according to the *Ill-informed at the Switch* scenario), the younger respondents were more inclined to act than the older participants. Nevertheless, the difference was not statistically significant.

In making a choice between saving one person, or saving five (*Bystander at the Switch*), both age groups were equally willing to sacrifice one person to save five. The same similarity of the results was observed in the responses given in the *Fat Man* scenario. The results are presented in Tables 5 and 6.

Table 4. Results of *Ill-informed Bystander at the Switch* scenario for the younger and older respondents

	Pull the lever to save a person (percentages of younger/older respondents)	**Not pull the lever (percentages of younger/older respondents)**
20 years or younger	23 (70%)	10 (30%)
21 years or older	22 (63%)	15 (37%)
Σ	45	25

*The chi-square statistics is 0.7963. The p-value is .3722. The result is **not** significant.*

Table 5. Results of *Bystander at the Switch* scenario for the younger and older respondents

	Pull the lever to save five persons and sacrifice one (percentages of younger/older respondents)	**Not pull the lever (percentages of younger/older respondents)**
20 years or younger	29 (88%)	4 (12%)
21 years or older	33 (89%)	4 (11%)
Σ	62	8

*The chi-square statistics is 0.0296. The p-value is 0.8634. This result is **not** significant.*

Table 6. Results of *Fat Man* scenario for the younger and older respondents

	Push down one man to save five (percentages of younger/older respondents)	**Not push the man (percentages of younger/older respondents)**
20 years or younger	20 (61%)	13 (39%)
21 years or older	23 (62%)	14 (38%)
Σ	43	27

*The chi-square statistics is 0.0358. The p-value is .498. The result is **not** significant.*

Our data do not permit us to support the hypothesis that there are any significant differences between the age groups for this study. One possible explanation for such homogeneity could be attributed to the lack of breadth in age distribution. The sample's age ranged from 18 years to 32 years – primarily the millennials. A broader range of age groups, i.e., a mix of the Baby Boomers, Generation X, and Generation Y may reveal some differences.

3.2.3. Relational Status

Forty-five (64%) of the respondents were single, 19 (27%) were in a relationship and 6 (9%) were married. The sample was collapsed into two categories: Singles and Non-Singles. Thus, the non-single group accounted for 36% of the sample.

When the situation called for switching the lever to save a life, the two groups were equally keen on saving the one person.

In the case of making a decision about saving five lives or saving one, as presented in Table 8, the two groups (Singles and Non-Singles) differed significantly.

The data imply that the single people are more likely to sacrifice one person to save five. Alternately, people in relationships are more reluctant/cautious about making a life-and-death decision.

Will they push the person over to save the people on the track? Both groups are less willing to act in this case than on the second scenario. The single people are slightly more inclined to sacrifice one life to save five, however, the difference between singles and non-singles is not statistically significant.

We can only venture that we have noted partial support for the hypothesis that the relational status may influence people's moral choices. We realize that larger sample is needed to draw any generalizable conclusions.

Table 7. Results of *Ill-informed Bystander at the Switch* scenario for singles and non-singles

	Pull the lever to save a person (percentages of singles/non-singles)	**Not pull the lever (percentages of singles/non-singles)**
Singles	29 (64%)	16 (36%)
Non-singles	16 (64%)	9 (36%)
Σ	45	25

*The chi-square statistics is 0.0014. The p-value is 0.9703. This result is **not** significant.*

Table 8. Results of *Bystander at the Switch* scenario for singles and non-singles

	Pull the lever to save five persons and sacrifice one (percentages of singles/non-singles)	**Will not pull the lever (percentages of singles/non-singles)**
Singles	43 (96%)	2 (4%)
Non-singles	19 (76%)	6 (24%)
Σ	62	8

*The chi-square statistics is 6.0717. The p-value is 0.0137. This result **is** significant.*

Table 9. Results of *Fat Man* scenario for singles and non-singles

	Push the man to save five (percentages of younger/older respondents)	**Will not push the man (percentages of younger/older respondents)**
Singles	29 (64%)	16 (36%)
Non-singles	14 (56%)	11 (44%)
Σ	43	27

*The chi-square statistics is 0.4837. The p-value is .4868. The result is **not** significant.*

4. Conclusions

Our research confirms the previous findings that people's choices are not fully consistent. The differences revealed between the second and the third of our scenarios, i.e. *Bystander at the Switch* and *Fat Man*, demonstrate that the respondents are reluctant to act if they are required to be emotionally and physically engaged in the process of decision making.

In our study, we have tried to control for several variables that may influence the respondents' choices. By selecting a homogeneous sample of college-age students, we controlled for the cultural diversity and variations in age. By having a group of students pursuing communication studies, we controlled for variations associated with pre-selection of the majors and indoctrination by the courses taken during their university years. By employing hypothetical scenarios that remove the genetic relationships, we have also controlled for the bias that will be inherent if the subjects were to collaborate with, or offer help to, their genetically connected relatives. The importance of such links was demonstrated by, among others, Bleske-Rechek et al. (2010). In this regard, we have created an experimental situation where the beneficiaries are unknown to the benefactors and the anticipated return reward is nonexistent.

Since we are working with a relatively small sample, we have to use the utmost caution in drawing any conclusions. The similarities and differences may only apply to our specific sample population. Our data reveals that most people will act to save another person's life. Over 60% of the respondents said they would go as far as pushing (killing) a person to save five lives. Two-thirds of the sample in the *Ill-informed Bystander at the Switch* scenario opted to pull the lever and switch the path of the trolley to save the person tied to the tracks. Finally, in our sample, 87% of participants said they would sacrifice one person to save five people's lives.

Both biological and social-roles theories suggest that women are more likely to engage in a nurturing and caring behavior and that men are more likely to engage in helping behavior requiring heroism and chivalry (Erdle et al., 1992). On the surface, our data supports both of these assumptions. With a larger sample, we may be able to make more conclusive claims.

As the title of the paper suggests, ours is an exploratory study. Further research is needed with samples in different cultures, with a wider range of age distribution, and with respondents that are following different career paths. As an illustration, the students of economic, being better familiar with the work of John Stuart Mill and utilitarian ideas may respond differently to the scenario of sacrificing one to save five than the students of theoretical philosophy trained in Kantian absolutism (cf. Rubinstein, 2006; Bourget & Chalmers, 2014; Dzionek-Kozlowska & Rehman, 2017). People with families and children may respond differently to the third scenario. We intend to replicate the study in different cultures, with larger samples of different populations, and with individuals trailing different career paths. Thus far, our effort is a humble first-step.

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