Effects of Different Causal Agents in Ultimatum Bargaining: How Attributions of Causal Agents Affect Ultimatum Bargaining Offers

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Abstract

The present study investigates whether offers in ultimatum bargaining are similar or different between contexts where the responder of an offer is random-natured and human-natured. It was hypothesized that the mean of the total amount of points offered would be similar between the two conditions of the causal agent of a minimal acceptance offer being an act of randomness and an act of a human being. Forty-two (30 women, 12 men; age range = 16-26, *M* = 19.45) undergraduate students of California State University, East Bay played the role as both an offerer and a responder in an ultimatum bargain. They were randomly assigned in the responder role to either decide a minimum acceptance level on their own or by a roll of a dice. The hypothesis and its corollary predictions were based upon attribution theory and the illusion of control. Results from a t-test confirmed the hypothesis that the two conditions would yield similar results in the mean number of points offered. However, the means found were higher than predicted. Consequently, subsequent t-tests were calculated in order to test whether the means of the offers in both conditions were significantly different from the predicted mean. These results brought further corroboration of the hypothesis. Results have implications in ultimatum bargaining as the difference of the selected contexts of the responders resulted in the similar mean number of points being offered by offerers which implies that there is little consequential difference in an ultimate bargain between the two selected conditions.

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Ultimatum bargaining has been researched extensively. It has not, however, been researched adequately. Recent research in ultimatum bargaining and game theory has been a testament to this, where novelties have been created in the procedures involved in ultimatum bargaining leading to modified ultimatum bargaining and to attention being given on new variables involved in the complexities of game theory (Gurevich, Kliger, & Weiner, 2012; Nelissen, Someren, & Zeelenberg, 2009). Modifications to the structure of ultimatum games can bring about new discoveries in what has limited the traditional model of ultimatum bargaining Nelissen, Someren, & Zeelenberg, 2009). Focusing on new variables could identify new causal factors that were before untested (Gurevich, Kliger, & Weiner, 2012). New research could be conducted on furthering these new developments or could be conducted to further other previous developments that have only been sparsely investigated. Generally missing from the literature of research studies are experiments involving comparisons of ultimatum bargaining between contexts that are random and contexts that are human driven. Such comparisons can bring about new information regarding the similarities and differences of ultimatum bargaining between the two conditions. This information would contribute to the practical world by helping agents of ultimatum bargaining be informed in their decision-making. If an ultimatum bargaining situation occurs, the informed person would understand the factors and processes involved and this would, in turn, help him or her make a better decision than an uninformed person. From the knowledge of the similar and different factors and processes of an ultimatum bargaining game, an agent would understand that the context of ultimatum bargaining matters. If it is a context of chance, certain variables could be at play that are similar or different than those in the context of human-nature. Accordingly, the agent could act in correspondence with contextual information.

Ultimatum bargaining is a zero-sum game in a bargaining situation that involves the allocation of resources. The game requires at least two participants – one who is the offerer and the other who is the responder. The offerer’s task is to propose an allocation of the units of the resource in a division between him or herself and another participant. The responder’s task is to decide on whether to accept or reject this offer. If the responder accepts, the responder receives the number of units of the offer. The offerer would receive the rest. If, however, the responder rejects the offer, neither the offerer nor the responder receives any units of the resource. There is only one iteration in the ultimatum bargain and therefore it is a one-time transaction.

It has been found that people deviate from game theoretic predictions of economic decisions. The prediction that an offerer will offer the minimal amount in a self-interested payoff maximizing behavior thinking that the responder will choose to accept because something is better than nothing is violated. Instead, offerers on average offer 30% to 40% of the total allocation units, with a 50/50 split being frequently the mode. Responders do not choose to accept something rather than nothing as offers of less than 20% are frequently rejected (Camerer & Thaler, 1995). The reasons why this occurs is that people take into consideration factors other than those proposed by the standard economic approach. One such factor that affects the economic decisions of a person is the causal information that he attributes. A recent study found that there is a significant link between causal attribution and economic decisions (Gurevich et. al., 2012).

According to attribution theory, “people often shape their reactions to events and situations according to their subjective understandings of what brought about these happenings, and the determinants of their reactions are the casual dimensions underlying the causes for the situation in question” (Gurevich et. al. 2012, p. 440). For example, if a member of a group was to decide on how to allocate a division of a monetary prize rewarded to them for having won a contest, that member would cognize casual information about the circumstances of the contribution of each member of the group in their winning of the contest. How much effort did each member put in? How able was each member? Was this member’s contribution an act he was responsible for or was someone else responsible for his contribution? These might be the questions the member had answered in his mind. In other words, this member made attributions of how each member had caused their winning of the monetary prize. This casual information determined his decision about the allocation of the monetary prize.

Because causal attributions are linked to their corresponding economic decisions, casual attributions would be made by the offerers about the responders and this would, consequently, affect their decision on how they chose to the divide the units of the resource. When the causal agent of a minimal acceptance offer is a human being, the causal attributions to be made by the offerer would relate to human-nature. Therein, a person’s cognitions, causalities pertaining to human psychology would be salient. An offerer might state a fair minimum acceptance level thinking that the human responder might be motivated by fairness and this would cause him to accept a fair offer. In contrast, when the causal agent of a minimal acceptance offer is random-generated, the causal attributions to be made by the offerer would relate to random-nature. The offerer will cognize causalities pertaining to chance and would make an offer based on his analysis of what chance might generate. An offerer might offer a high amount of units of the resource thinking that he or she will, in turn, have a high probability of having his or her offer accepted rather than rejected.

Research has shown that when people are in an uncontrollable situation they tend to act as if they could control the outcomes of the situation when the features of the uncontrollable situations resemble skill-related factors in a skill event. This phenomenon is expressed in the theoretical foundation of the concept of the illusion of control. Skill-related factors that have been shown to induce the illusion of control are the familiarity with the task, passive or active involvement, competition, and choice. The general theoretical explanation for the illusion of control is that a person exhibits an illusion of control when he or she overestimates his personal probability of success over the objective probability of success (Langer, 1975). Such is the case when a gambler acts as if his personal chances of winning a prize are higher than the known objective probability. The gambler would be demonstrating this if he or she were to act in increasingly confidence in winning as the frequency of his or her winning increased, but while the objective probability of winning remained the same. One study found that perceived control increased in people when they had caused the outcome and when they knew beforehand what they wanted to obtain (Wortman, 1975). Hence, in cases where people have the opportunity to cause their outcome and know beforehand what they want to obtain, one could expect a greater chance of the inducement of the illusion of control.

The aim of this study was to research whether offers made in ultimatum bargaining were similar or different in contexts where the responder of the offer was random-natured or human-natured. It was hypothesized that in ultimatum bargaining, the average of the total amount of points offered would be similar when the causal agent of a minimal acceptance offer is an act of randomness and when the causal agent of a minimal acceptance offer is an act of a human being. It was predicted that offers when the causal agent of a minimal acceptance offer was a human being would yield the same results as previous research had done; namely, that offers would be at 40% of the total allocation units. It was also predicted that when the causal agent of a minimal acceptance offer was random-natured, offers would be less than equality at 40% of the total allocation units as offerers would exhibit the illusion of control within having casually attributed the event as random-generated (most importantly, knowing from their causal attributions that offering half of the number of units of the resource would mean a 50% chance of success would be salient to participants as the crux of their decision) along with the inducing factors of having an active involvement, competition with a responder for a prize, and the choice of the division of the resource units. Offerers would therefore take more risk in the chance event by allocating less than half of the points (taking a less than 50% chance of success in a random event where failure means gaining nothing) because of having an expectancy of personal success inappropriately higher than the objective probability of success of his or her division of the units of the points (i.e., believing him or herself to be more in control than what the objective situation would warrant). Given that offerers cause the outcome of their offer division and know beforehand what they want to obtain, the increase in perceived control would lead to an increased inducement of the illusion of control giving further support that offerers would take more risk than the probability of success of 50%. These two predictions lead to the general prediction that across the two different contexts, the offers would be similar in being at 40%.

The current research study contributes to scientific literature by its investigation of how the different contexts of random-natured and human-natured responders affect offers made in ultimatum bargaining. The prediction made for the condition of a human-generated minimal acceptance level is drawn from the summary findings of previous research. The prediction made for the condition of a random-generated minimum acceptance level stems from the application of attribution theory, the illusion of control, and perceived control, presents a novelty in research literature. Also, having compared the two conditions that are of two different contexts of random-natured and human-natured adds to the limited amount of research completed within this topic. Individual results from the two conditions could further corroborate previous research, whereas the results taken in comparison can bring new meaning to the topic. Results would be able to show whether the two different contexts of responders bring about similar or different results in offers made in ultimatum bargaining. In either case, implications of the results would be important. If similar, then the different contexts would not matter as much, whereas if different, the different contexts would matter.

**Method**

**Participants**

Forty-two (30 women, 12 men; age range = 16-26, *M* = 19.45) undergraduate students of California State University, East Bay were used as participants. The students were enrolled in an introductory psychology course who participated in order to fulfill the psychology course requirements of research credits. They registered in the experiment by signing their names onto a posted sign-up sheet. Among the participants were 9 African Americans (20.5%), 7 Caucasians (15.9%), 5 Hispanics (11.4%), 4 East Asians (9.1%), 4 South East Asians (9.1%), 2 Pacific Islanders (4.5%), 10 Filipinos (20.5%) and 2 people of other ethnic origins (4.5%). There were two participants whose gender, age, and ethnicity were not identified.

**Design**

The quantitative experiment used a true-experimental between-subjects design. The between-subjects factor independent variable was minimal acceptance level causation. There were two levels of minimal acceptance level causation – random-generated and human-generated. Random-generated minimal acceptance levels were caused by the random-nature of a roll of a fair six-sided dice. Human-generated minimal acceptance levels were caused by the human-nature of a human being. The dependent variable was the mean number of points offered. This was measured by taking the written statements of the amount of points offered and scoring them by the average mean of the total points offered exclusively between the two levels of the independent variable.

**Procedure**

To control for demand characteristics and experimenter bias, researchers learned a script and applied the script throughout the entirety of the experiment. The script documented what researchers were to say and do at specific times during the experiment. Hence, experimental procedures were standardized. This limited any possible confounds that could have occurred because of demand characteristics or experimenter bias. The script included setting up the lab room, welcoming, consent forms, instruction giving, asking for questions, administering the quiz, and debriefing. A week before the experiment, a rehearsal of the script was done involving all of the researchers in order for researchers to practice the script. The research proposal was submitted to California State University, East Bay’s institutional review board and the institutional review board approved of the experiment.

Five participants participated per experimental session. The participants were instructed to enter into the experimenting room and to sit on a designated seat that had the experimental materials on the table. They were randomly assigned as a group as each experimental session was randomly assigned to either the random-generated minimal acceptance level condition or the human-generated minimal acceptance level condition. Participants were first told to read the consent forms. After they decided to participate in the experiment by signing the consent form, researchers read to the participants the rules of ultimatum bargaining. They were given examples of ultimatum bargains and were then given the opportunity to ask any questions. After answering any questions, they were quizzed on their comprehension of ultimatum bargaining. Researchers checked their answers on the quiz and corrected errors with an explanation.

The ultimatum bargaining task began with the participants reading the instructions for their ultimatum bargaining task. They learned that they would engage in ultimatum bargaining twice. This engagement would involve the ultimatum bargaining for points towards a chance to win a small prize by a lottery. The more points that a participant acquired, the higher the chances he would have in winning the prize. First, they would play the role of the responder who had to decide on a minimal acceptance level. Responders were instructed to state the lowest number of points out of a possible 7 points that they would accept from an offerer. They were told that this amount would be matched with an offer made by an offerer that was created from his own judgment. Participants in the experimental sessions assigned to the random-generated minimal acceptance level condition created their minimal acceptance levels by a roll of a fair six-sided dice. Participants in the experimental sessions assigned to the human-generated minimal acceptance level condition created their minimal acceptance levels by their own judgment. Second, they would play the role of the offerer. Offerers were instructed to state the number of points out of 7 that they would offer to a responder. Participants in the experimental sessions assigned to the random-generated minimal acceptance level condition created their offers with the knowledge that their offer would be matched by a responder who had created their minimal acceptance levels by a roll of a fair six-sided dice. A high mean of offers in this condition would suggest a low overall illusion of control for participants, whereas a low mean of offers would suggest a high overall illusion of control for participants. Participants in the experimental sessions assigned to the human-generated minimal acceptance level condition created their offers with the knowledge that their offers would be matched by a responder who had created their minimal acceptance levels by their own judgment. A similar mean of offers between the two conditions indicates little consequential difference in ultimate bargaining between the two conditions, whereas a different mean of offer between the two conditions indicates that there is a consequential difference in ultimatum bargaining between the two conditions.

When the ultimatum bargaining task was completed, participants answered a few demographic questions and a question of what they thought the purpose of the experiment was. The latter was asked to check for demand characteristics. Participants then stated their university e-mail address in order for them to be contacted in the event that they were the lottery winners. This was stated on a separate contact information page that was separated from the data after the lottery was completed. This helped protect the confidentiality of participants’ data. After, they were debriefed and they were instructed not to tell any potential participants any knowledge of the experiment that they had acquired from participating in the experiment. This was a further measure of controlling demand characteristics. They were told to leave their experimental materials on the table and to take the debriefing sheet. Then, they were dismissed.After the participants left the experimental room, researchers made a specified mark on the first page of a participant’s experimental packet if the participant was judged as irregular. Whenever data analysis was conducted on a public computer, researchers deleted the data file after having completed their analysis as another measure of protecting the confidentiality of participants’ data.

**Results**

To test whether there was a significant mean similarity in offers between the random-generated minimal acceptance level and the human-generated minimal acceptance level, an independent t-test was calculated, *t*(31) = .583. The mean number of points offered were similar between the random-generated minimal acceptance level (*M* = 3.26, *SD* = .87) and the human-generated minimal acceptance level (*M* = 3.50, *SD* = 1.45). The independent t-test was not statistically significant (*p* = .56) which meant that the mean difference of the offers were not significantly different and therefore from its negation were significantly similar. This supported the hypothesis that the two conditions would yield similar results in the number of points offered. In fact, they were very similar as the difference between the two conditions was only .24 points. The number of points offered in both conditions, however, was at a level higher than predicted being near the equality level of 50% and not around the predicted 40% level for both the random-generated minimal acceptance level and for the human-generated minimal acceptance level.

Two subsequent one-sample t-test were calculated in order to test whether the means of the offers of both conditions were significantly different from the predicted mean level of 40% of the number of total points. Results for the one-sample t-test run for the human-generated minimal acceptance level condition, *t*(13) = 1.8, showed that there was not a statistically significant difference between the mean of offers made in this condition (*M* = 3.5, *SD* = 1.45) and the 40% level of 2.8 points (*p* = .1). Results for the one-sample t-test run for the random-generated minimal acceptance level condition, *t*(18) = 2.32, showed that there was a statistically significant difference between the mean of offers made in this condition (*M* = 3.26, *SD* = .87) and the 40% level of 2.8 points (*p* = .03). Extenuating this result was the low mean difference of .46. This is roughly half a point from the predicted level and accounts for 6.57% of the total number of points. Therefore, the subsequent one-sample t-tests demonstrated that the predictions and the hypothesis were generally warranted.

Data from 11 participants was omitted from the data analysis creating a total of 33 participants whose data was analyzed. The criteria for omission was twofold – a participant would be omitted when the participant was judged as being irregular and when the participant was judged as knowing what the purpose of the experiment was. The criteria for judging a participant as irregular consisted of the participant answering all the quiz questions with the same answer choice, looking extremely bored, irritated, or frustrated, repeatedly talking with another person, texting or facebooking, not understanding the instructions even after completing the quiz and having a researcher explain the correct answers, and stating that he or she already knew the goals of the study.

**Discussion**

Results from a t-test supported the hypothesis that offerers would offer similar number of points in contexts where responders were random-natured and human-natured. A concern from the results was that the similarity level in the mean number of points was higher than the predicted level of 40%. The result of the number points in offers being exactly at the equality level of a 50/50 split in the condition where responders made their own decision about the minimum acceptance level is higher than what previous research has found (Camerer & Thaler, 1995). Also, the result of the number of points in offers being near the equality level of a 50/50 split in the condition where responders made their minimum acceptance level based on chance was higher than the theoretical prediction made based on previous research of the illusion of control and perceived control (Langer, 1975; Wortman, 1975). Subsequent t-tests were performed to test whether the differences found in the actual means and the predicted mean were statistically significant. For the human-generated minimal acceptance level condition, it was found that the mean difference was not statistically significant. There was, indeed, a statistically significant mean difference found in the random-generated minimal acceptance level condition. Qualifying this result is the low mean difference found between the predicted level and the actual experimented level. In conclusion, the part of the hypothesis predicting that the two conditions would yield similar results in the mean number of points was confirmed by the first t-test. In the other part of the hypothesis, the reasons for projecting the mean number of points to be at 40% were generally supported by the subsequent t-tests.

Thus, because the supported hypothesis was derived from previous research, the previous research was also supported from the results. Previous research that found that offerers offer an average of 30% to 40% of the total allocation units was confirmed by the present study as offerers offered a mean that was not significantly different from the predicted mean of 40% of the total amount of points when in the context of a responder being a human being (Camerer & Thaler, 1995). Previous research on attribution theory, the illusion of control, and perceived control were also confirmed by the present study as offerers offered a mean that even though was statistically different from the predicted mean of 40%, the mean number of points offered had a low mean difference from the predicted mean of 40% of the total amount of points. This result suggests that participants were exhibiting the illusion of control as their mean number of points offered was below the probability of success of 50%. They made casual attributions about the event as one being caused by chance and they were induced into an illusion of control by having an active involvement, competition with a responder for a prize, and the choice of the division of the resource units along with a heightened sense of perceived control.

The practical implications of the experiment’s results are that people who play the role of offerers in ultimatum bargains offer similar number of points when contexts of the responders to the offer are random-natured and human-natured. This indicates that any possible contextual affects that are particular to each of the two conditions do not matter when it comes to the consequential decision of an offer because they both yield the same consequence or result. Such results can be extrapolated into the real-world during ultimatum bargaining engagements involving the two different contexts of human-natured responders and random-natured responders. Agents acting as offerers and responders in the real world would, in turn, be able to make decisions in bargains that would benefit from the information collected in this experiment and future experiments that are similar. For example, agents would be less likely to prefer one of the responder contexts over the other in ultimatum bargains knowing that the similarity between offers made in responder contexts of chance and human-nature are similar and therefore the context does not matter between the two. They would understand that neither yields more favorable results for them and therefore would know not to attribute favorability of results or other factors such as fairness to one or the other condition.

The present research has a few limitations. One limitation of the experiment was the low sample size. This would negatively affect the generalizability of the results of the experiment. A small sample size brings the risk of the group studied not being representative of the larger population and therefore a threat to external validity. Another limitation of the experiment was the lack of any surveys to ascertain the causal attributions that participants made between the two conditions. What the participants had causally attributed to the responders was not collected. This meant that the results of the study could only be used to suggest or imply that participants had casual attributions based on the association found between economic decisions and casual attributions from previous research (Gurevich et. al., 2012). The use of surveys could have also given stronger support for the exhibition of the illusion of control in participants. This limited the study in its scope and in its findings. A further limitation of the experiment was that there was a difference in the range of points that could be stated as the minimal acceptance level between the two conditions. Whereas in the human-generated minimal acceptance level condition participants could state their minimum acceptance level anywhere from 0 to 7, in the random-generated minimal acceptance level condition participants could only state their minimum acceptance level anywhere from 1 to 6 (as this is the range of points in a roll of a dice). This confound created an unequal possible distribution of minimal acceptance levels, which could have affected the decisions of offerers to act differently between the two conditions. Therefore, an alternative explanation for the results would have been this confound.

Future research could serve the purpose of further investigating how different contexts of responders can affect an offerer’s offer. A larger sample can provide more robust statistical power and generalizability. Future research could directly ascertain what casual attributions offerer’s make in the differing contexts by the use of appropriate surveys. They could also be able to discover the similarities and differences between the casual attributions of the differing contexts. Surveys could also be used to find support for the exhibition of the illusion of control in ultimatum bargaining where the responder is random-natured. Such a survey can involve measuring whether the confidence a participant has in his choice of division of the units of the resource is more when the participant is in a situation where factors inducing the illusion of control are prevalent and another situation where there are no factors of inducement with the objective probability of success being the same between the two random conditions. From these, researchers could better understand how and why might the casual attributions made between the two different contexts and the exhibition of the illusion of control create similar consequential results. New studies could eliminate confounds like the one found in this experiment by more diligent and meticulous consideration for the equality between the experimental conditions other than the experimental manipulation. Human-natured contexts and random-natured contexts in future research ought to give participants an equal amount of range in the option of the minimal acceptance level.

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Appendix

Table 1: SPSS Outputs for the frequency of the age, ethnicity, and gender of the participants.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
|  | | age | ethnic | gender |
| N | Valid | 42 | 42 | 42 |
| Missing | 2 | 2 | 2 |
| Mean | | 19.4524 | 4.9524 | 1.7143 |

Table 2: SPSS Outputs of frequency tables for the age of the participants.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 16.00 | 1 | 2.3 | 2.4 | 2.4 |
| 18.00 | 7 | 15.9 | 16.7 | 19.0 |
| 19.00 | 23 | 52.3 | 54.8 | 73.8 |
| 20.00 | 4 | 9.1 | 9.5 | 83.3 |
| 21.00 | 4 | 9.1 | 9.5 | 92.9 |
| 23.00 | 1 | 2.3 | 2.4 | 95.2 |
| 25.00 | 1 | 2.3 | 2.4 | 97.6 |
| 26.00 | 1 | 2.3 | 2.4 | 100.0 |
| Total | 42 | 95.5 | 100.0 |  |
| Missing | System | 2 | 4.5 |  |  |
| Total | | 44 | 100.0 |  |  |
| Table 3: SPSS Outputs of frequency tables for the ethnicity of the participants.  Ethnic | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 1.00 | 9 | 20.5 | 21.4 | 21.4 |
| 2.00 | 7 | 15.9 | 16.7 | 38.1 |
| 3.00 | 5 | 11.4 | 11.9 | 50.0 |
| 4.00 | 4 | 9.1 | 9.5 | 59.5 |
| 6.00 | 4 | 9.1 | 9.5 | 69.0 |
| 9.00 | 2 | 4.5 | 4.8 | 73.8 |
| 10.00 | 9 | 20.5 | 21.4 | 95.2 |
| 11.00 | 2 | 4.5 | 4.8 | 100.0 |
| Total | 42 | 95.5 | 100.0 |  |
| Missing | System | 2 | 4.5 |  |  |
| Total | | 44 | 100.0 |  |  |
| Table 4: SPSS Outputs of frequency tables for the gender of the participants.  Gender | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | m | 12 | 27.3 | 28.6 | 28.6 |
| f | 30 | 68.2 | 71.4 | 100.0 |
| Total | 42 | 95.5 | 100.0 |  |
| Missing | System | 2 | 4.5 |  |  |
| Total | | 44 | 100.0 |  |  |

Table 5: SPSS Output for the independent t-test.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | | | | | | | | |
|  | | | cond | | | N | | | Mean | | | Std. Deviation | | Std. Error Mean | | | |
| offer | | | self-determined minimum | | | 14 | | | 3.5000 | | | 1.45444 | | .38871 | | | |
| dice roll minimum | | | 19 | | | 3.2632 | | | .87191 | | .20003 | | | |
| Table 6: SPSS Output for the independent t-test. | | | | | | | | | | | | | | | | | |
|  | | | | | Levene's Test for Equality of Variances | | | t-test for Equality of Means | | | | | | | | | |
| F | Sig. | | t | df | | Sig. (2-tailed) | Mean Difference | | Std. Error Difference | | 95% Confidence Interval of the Difference | |
| Lower | Upper |
| offer | | | Equal variances assumed | | 4.099 | .052 | | .583 | 31 | | .564 | .23684 | | .40598 | | -.59115 | 1.06484 |
| Equal variances not assumed | |  |  | | .542 | 19.794 | | .594 | .23684 | | .43716 | | -.67567 | 1.14936 |

Table 7: SPSS output for the one sample t-test of the human-generated minimal acceptance level.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
|  | N | Mean | Std. Deviation | Std. Error Mean |
| SelfOne | 14 | 3.5000 | 1.45444 | .38871 |

Table 8: SPSS output for the one sample t-test of the human-generated minimal acceptance level.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | |
|  | Test Value = 2.8 | | | | | |
| t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| Lower | Upper |
| SelfOne | 1.801 | 13 | .095 | .70000 | -.1398 | 1.5398 |

Table 9: SPSS output for the one sample t-test of the random-generated minimal acceptance level.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
|  | N | Mean | Std. Deviation | Std. Error Mean |
| rollTwo | 19 | 3.2632 | .87191 | .20003 |

Table 10: SPSS output for the one sample t-test of the random-generated minimal acceptance level.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | |
|  | Test Value = 2.8 | | | | | |
| t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| Lower | Upper |
| rollTwo | 2.315 | 18 | .033 | .46316 | .0429 | .8834 |