

# Grounded Models for Understanding Conflicts from Multiple Points of View

Course VI Advanced Project

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## **Abstract**

Understanding the effect of culture on how people think is important to begin to understand human cognition. Cultural misunderstandings can be attributed to differences in cultural experiences, instead of differences in cognitive mechanisms. If we are to understand how people think, we need to create models that show us how cultural experiences forge different points of view. In this project, I study the effect of Eastern and Western cultures on reasoning by precedents. I use the analogical mapper of the Bridge Project to determine structural similarities between matched stories to simulate the process of reasoning about a current event against already-established precedents. Using eleven soccer article stories from Eastern culture publications and ten soccer article stories from Western culture publications, the analogical mapper matches stories against each other and assigns match scores for each story pair. After hypothesizing that scores for Eastern against Western stories are lower than scores for Eastern or Western stories matched against themselves, the results of this experiment show that the differences in the scores are statistically insignificant, with a  $p$ -value of 1. I propose areas of the experiment that could be improved upon to obtain more significant results.

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# 1 Introduction

Both of my parents were born and raised in South Korea, while I was born and raised in the United States. Like any family, I had my share of disagreements with my parents and often could not understand how they could not see my Western point of view of a situation. I have also experienced situations outside of my family when I can tell that my Eastern upbringing affects how my point of view differs from the point of view of someone brought up in a different cultural household.

While these situations seem trivial on the level of family and friends, cultural conflicts around the world, such as the current situation between the United States and Iraq, can also be attributed to cultural misunderstandings. Often, these misunderstandings are blamed on mental disease or other physical difference. However, when an entire group of people, such as a culture, think differently from us, it is more likely to be that they have different experiences which affect their points of view. If we are to understand how people think, we need to create models that show us how cultural experiences forge different points of view.

## 2 Steps

I focused my efforts on using precedents to understand how culture affects the ways people think. Precedents provide a strong basis for reasoning by comparing a current event with experiences learned from previous events. Some examples of cultural precedents that may have influenced the thoughts of different cultures include fairy tales, famous historical events, or folk stories (Morris, 1994, [7]). If different cultures do think differently, then their culturally-influenced precedents must be different as well (Chen, 2004, [2]).

To test culturally-biased precedents, I selected two different cultures to compare their cultural precedents. From these cultures I wrote stories extracted from soccer articles found in these cultures' newspaper publications. I measured the similarity of the precedents in the different stories with the analogical mapper in the Bridge Project. My hypothesis is that stories from the same culture will have a higher mapping score than stories from different cultures.

### 2.1 Analogical Mapping in the Bridge Project

I used the idea of analogical mapping to measure how similar stories were. Analogical mapping measures the similarity between stories, based on the structure-mapping theory, described by Gentner (Gentner, 1983, [4]). The structure-mapping theory shows how similar structures can be used to interpret analogies. By mapping relations between objects instead of the specific meaning of the object, then structural similarities can be inferred when comparing a current target structure with previously existing base structures (Gentner, 1983,

[4]). This allows people to compare current events to past events by mapping the structures of the events and determining how they are related.

The program I used to perform the tests of cultural precedents was the already-existing Bridge Project. The Bridge Project translates English sentences into descriptions of trajectory. While the program was originally intended to depict the physical world around us, it was able to show trajectories for changes in abstract worlds, such as in conflicts between warring countries (Genesis, 2004, [3]).

The Bridge Project implements an analogical mapper, reimplemented from the structure-mapping engine (Gentner, 1983, [4]), to determine how well incoming stories match with each other based on a library of existing stories. An incoming story is mapped against already existing stories in the library and assigned a score based on how well the story features, or structural similarities, match. In Shimon Ullman’s work on face recognition (Ullman, 2002, [10]), he shows that people use intermediate-sized features to recognize and classify new images, as opposed to minute details or broad overviews. Using this idea of intermediate-sized features, the Bridge Project is able to match stories on a reasonably similar structural level.

I chose Westerners, people of European descent, and Easterners, people of East Asian descent, to represent the two cultural groups of my focus. These cultures have very different histories and ways of thought. In my research, I read many publications describing documented and studied differences between Westerners and Easterners. Based on my readings, I detailed the design of my experiment to test the effect of culture on causal attributions, using soccer articles from newspapers as my data set.

## 2.2 Models of Cultural Reasoning

Attributions are finding causal explanations for behaviors. Understanding the causes of events in the world allows people to predict events in the future. Studies have shown that Westerners and Easterners make different causal attributions (Norenzayan, 2002, [9]). Dispositionalism and situationalism are two patterns of attribution which psychologists have discovered to be strongly supported attributions in Western and Eastern cultures.

Westerners have been shown to make dispositional causal attributions, meaning they have a tendency to explain events with fundamental character traits; for example, “Jane forgot to buy the tickets because she is irresponsible”. On the other hand, Easterners tend to make situational causal attributions, such as “Jane forgot to buy the tickets because she was tired from staying up all night”.

### 2.2.1 Linguistic Reflection

The difference between situational and dispositional characteristics of Eastern and Western cultures can be seen with linguistic evidence in language construction. For example, the

Korean language has three different ways of speaking to people: elders to younger people, younger people to elders, and people of similar ages. A simple phrase such as Come and eat dinner is said in three different ways, depending on the age of the person being addressed. Researchers speculate that this reflects the idea that an individual is a different person depending on the people surrounding them, in other words, depending on their situation.

Another example that supports this linguistic reflection is when researchers ask both Easterners and Westerners, “Tell me about yourself”. Westerners tend to respond with “I am friendly” or “I am serious”, while Easterners say “I am out-going with my friends” or “I am hard-working at my job” (Nisbett, 2003, [8]). This again, is a reflection on the idea that Easterners believe themselves to be different people depending on the situation.

### **2.2.2 Gang Lu and Thomas McIlvane**

One of the more salient examples distinguishing between the dispositional attributions of Westerners and the situational attributions of Easterners is Morris’ study on the story of Gang Lu and the Thomas McIlvane (Morris, 1994, [7]).

Gang Lu was a Chinese graduate student studying at the University of Iowa in 1991. He submitted his dissertation at an award competition, and lost to another Chinese graduate student. The award was quite prestigious, and because he did not win the award, Lu had a difficult time finding a job. After failing to successfully appeal the decision of the awards committee, he shot his advisor, several other professors involved in the awards committee, other fellow students, and then himself.

When the American media reported this story, they almost exclusively focused on Lu’s presumed personality. They blamed the murders on Lu’s psychological health, such as saying that Lu had a “very bad temper” and a “sinister edge to his character”. However, the Chinese media explained the murders on Lu’s situation, such as “he did not get along with his advisor”, “had a rivalry with the slain student”, and “was isolated from the Chinese community” (Morris, 1994, [7]).

That same year, Thomas McIlvane, an American postal worker in Royal Oak, Michigan, lost his job. He asked his union to help his unemployment situation, and was unsuccessful. He then shot his supervisor, fellow members of the union, and then himself.

To ensure that the differences in attribution were not because of the murderer’s ethnicity, Morris focused on the McIlvane murders. Similarly to the Lu murders, the American media made dispositional explanations for McIlvane’s rampage. They said that McIlvane “repeatedly threatened violence”, “had a short fuse”, and was a “martial arts enthusiast”. Again, the Chinese media made situational explanations, such as “McIlvane had been recently fired” and he was “influenced by example of a recent mass slaying in Texas” (Morris, 1994, [7]).

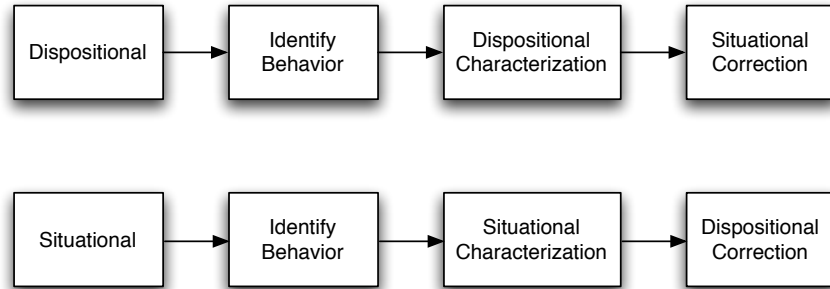


Figure 1: Mixed model of social inference (Lee, 1996, [6]).

This study is a significant example of how Americans made dispositional attributions, while the Chinese made situational attributions, to explain the same event. Because the documented effect of cultural influence in causal attribution is strongly supported, I based my experiment on stories involving causal attribution.

### 2.2.3 Mixed Model of Attribution

The mixed model of attribution developed by Krull (Krull, 1993, [5]) explains the thought process behind forming attributions. The mixed model of attribution focuses on the idea that people make an initial automatic attribution to events, and then given more time, take a correctional step to account for other factors. For example, if an Easterner were to initially make an overly situational attribution of an event, then given more time, he would correct for this attribution by considering dispositional factors and reducing oversituationalism. Lee illustrates this model in Figure 1 (Lee, 1996, [6]).

## 2.3 Data Set Construction

For my story sets, I decided to use newspaper articles. The decision to use newspaper articles to create stories to populate the Bridge Project was motivated by the fact that newspapers were unsolicited sources of information, as shown by the newspaper coverage of the Lu and McIlvane murders (Morris, 1994, [7]). Previously in other studies on cultural causal attributions, participants were asked to read fictitious stories that were often specifically concocted for that experiment. On the other hand, newspaper articles provide attributions for real events, as journalists with no experimental bias try to understand the causes of these events. Native journalists also naturally make attributions in their articles which reflect their culture, as opposed to an experimenter attempting to mimic a certain culture (Lee, 1996, [6]).

Based on existing research in culture and on the Lu and McIlvane murders, I concluded that newspapers from Western cultures would explain events in a dispositional way, and

newspapers from Eastern cultures would make situational explanations (Morris, 1994, [7]). Using the mixed model of attribution and the results from Lee’s research (Lee, 1996, [6]), I decided to use articles about soccer games as the basis for my data set stories.

### **2.3.1 Articles on Homicide**

Originally, articles written about murders were going to be used as data sets because of the many examples I found in the current research using the Lu and McIlvane scenarios. However, as I began collecting articles about murders, I discovered that there were many more stories about homicide in newspapers from the United States. It was very difficult to find a detailed story about a killing in the Japanese and Korean online newspapers that I browsed. I am unsure of an explanation for this observation; however, I speculate that this could be related to the statistics that show the United States having a homicide rate several times higher than most countries in the world, including Japan (Barclay, 2000, [1]). Other explanations might include possible differences in cultural attitudes about reporting on homicides, or lack of diversity in the Eastern publications that I browsed.

### **2.3.2 Sports Articles, Editorials, and the Mixed Model**

After determining that murder articles would not be used for the data sets, I used the mixed model of attribution and Lee’s work (Lee, 1996, [6]) to decide that using soccer articles would be more successful. Lee used the mixed model of attribution to predict that different types of articles in the same newspaper would have varying degrees of causal attribution. Lee found that within their respective cultural explanations, editorials were less prone to overdispositionalism or oversituationalism than sports articles. She attributed this result to the mixed model because editorials require more time to write, and because they are debatable, the authors invest more cognitive effort into writing them. Sports, on the other hand, are fairly straightforward, and leave much less room for debate, so authors put less cognitive effort into sports articles. Figure 2 illustrates Lee’s findings, showing that sports articles from the United States are highly dispositional, U.S. editorials are slightly dispositional, Hong Kong editorials are slightly situational, and Hong Kong sports articles are highly situational.

A Western sports writer might make dispositional claims, such as “Freshman Simpson leads the team in scoring with eleven goals, but its success lies in its defense”, or “We’ve got a very good keeper in Bo Oshoniyi, who was defensive MVP of the finals last year”. On the other hand, an Eastern sports writer might make situational attributions, like “We were lucky to go in at the interval with a one-goal advantage and I was always confident we could hold them off. I guess South China was a bit tired after having played in a quadrangular tournament in China” (Nisbett, 2003, [8]). Based on this research, I concluded that I would use soccer articles to populate my experiment.

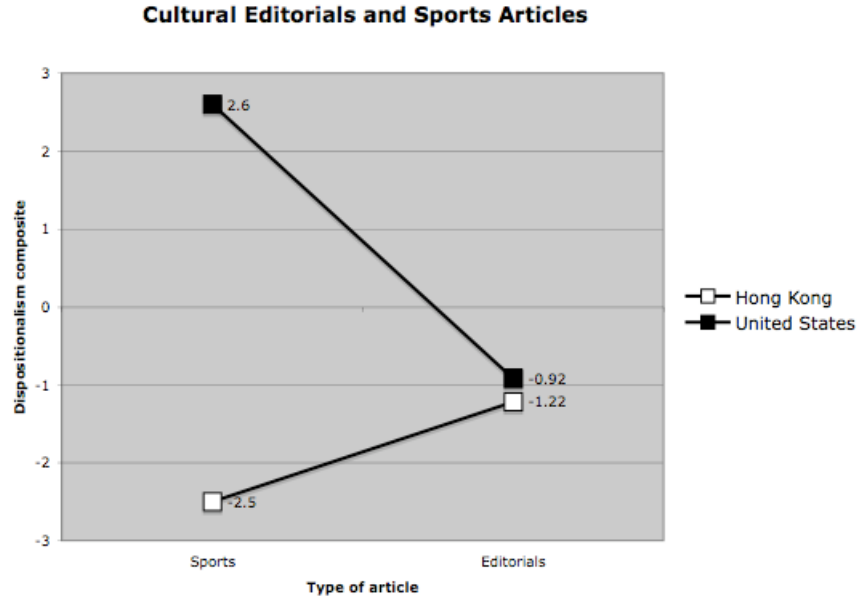


Figure 2: Dispositionalism means for U.S. and Hong Kong editorials and sports articles (Lee, 1996, [6]).

### 3 Experiment

I will prime each instance of the Bridge Project with each culture, and then compare each culture with itself first, to get a basis for the precedent scores. Then I will compare the Eastern stories with the Western stories, with the hypothesis that the matching precedent scores will be lower than the Eastern and Western cultures compared to themselves. This will indicate that the structure of stories matches with stories from the same culture and will match less with stories from another culture.

#### 3.1 Hypothesis

I hypothesize that the Eastern against Eastern story set and Western against Western story set will have higher mapping scores than the Eastern against Western or Western against Eastern story sets. Figure 3 gives an illustration of the model this experiment computes.

#### 3.2 Method

To predict causal attributions based on cultural background, I authored ten soccer stories from soccer articles in Western publications (BBC, Sports Illustrated, ESPN), and eleven soccer stories from soccer articles in Eastern publications (The Japan Times, Yomiuri, The Korea Times, Japan Today), using the grammar understood by the Bridge Project. For

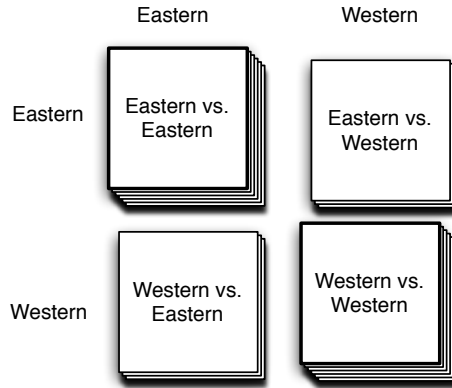


Figure 3: Story set model of experiment.

each set of culture stories, I created story sets to feed into the Bridge Project’s analogical mapper. The analogical mapper was written to use a greedy and consistent algorithm.

To match the Eastern stories against themselves, I set the full Eastern story set as both the source and target files in the analogical mapper.<sup>1</sup> Each Eastern story was then matched against itself and every other Eastern story. The analogical mapper found forty different structural mappings for each pair of stories. I selected the highest mapping score for each story pair because the maximum score meant that the story structure had the strongest match.

To match the Western stories against themselves, I set the full Western story set as both the source and target files.<sup>2</sup> I found only ten mappings for each pair of matched Western stories because finding forty mappings was discovered to take an extraordinary and unnecessary amount of time to compute. After analyzing the results of both the Eastern self-matched stories, and a smaller subset of the self-matched Western stories, I determined that the maximum score was consistently found in the first two mappings. Based on this reasoning, I concluded that by only computing ten mappings for each pair of stories, instead of forty, no maximum scores were lost.

After determining the mapping scores for the Eastern stories against themselves and the Western stories against themselves, I set the analogical mapper to compute the scores by comparing Eastern stories against Western stories. I ran this part of the experiment twice, once with the Eastern stories as the source and the Western stories as the target<sup>3</sup>, and

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<sup>1</sup>CultureExperiment002

<sup>2</sup>CultureExperiment004

<sup>3</sup>CultureExperiment007

Table 1: Sample of Eastern against Eastern story scores.

	Story 1	Story 2	Story 3
Story 1	<b>33.77</b>	26.63	29.55
Story 2	26.63	<b>30.88</b>	26.63
Story 3	29.55	26.63	<b>32.74</b>

the other with the Western stories as the source and the Eastern stories as the target.<sup>4</sup> The analogical mapper was set to perform twenty mappings for each pair of stories. I chose twenty because as I discovered in the self-matching Western stories, forty was an unnecessary number of mappings to compute. However, the mixed mappings did not take as long to compute as the self-matching Western stories, so I was able to efficiently afford performing twenty mappings, just to be more confident about finding the maximum mapping score.

## 4 Results

To evaluate the results of my experiment, I first normalized the maximum scores for each pair of stories, and then calculated the averages, standard deviations, and T-statistics for each block.

### 4.1 Normalizing Scores

To normalize the maximum scores of each story pair, I averaged the scores of the self-matches for both stories from the pair. After determining the average, I divided the computed score of the pair by the averaged score of the self-matches of the stories comprising the pair.

Table 1 is a sample of Eastern against Eastern story scores, with the scores of stories matched against themselves in bold. Using equation 1, the normalized scores were calculated for each story pair, resulting in a normalized score between 0 and 1. When stories were normalized, stories that were compared against themselves had a calculated normalized score of 1, trivially showing the base case of a story always matching itself.

$$\text{normalization}_{x,y} = \frac{\text{score}_{x,y}}{\text{average}(\text{score}_{x,x}, \text{score}_{y,y})} \quad (1)$$

Figure 4 shows a graph of all of the normalized scores for each story set.

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<sup>4</sup>CultureExperiment008

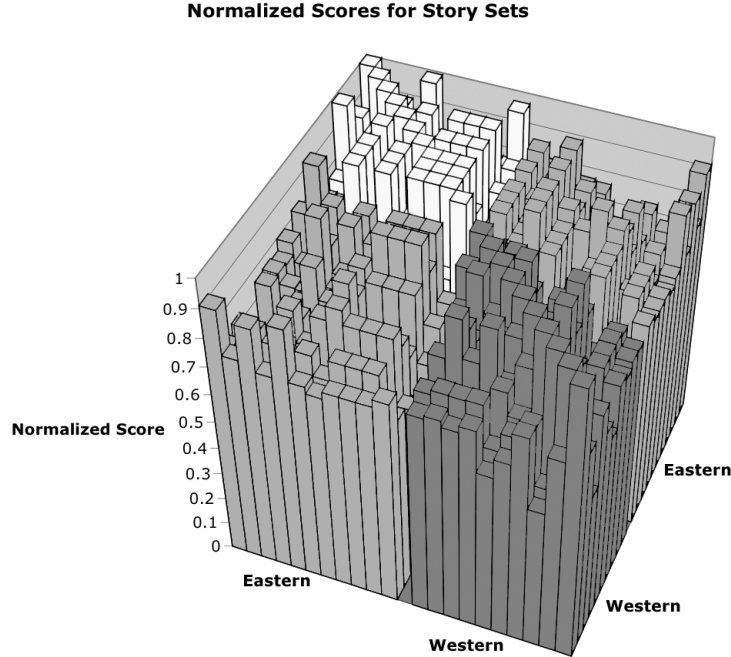


Figure 4: Normalized scores for story blocks.

## 4.2 Calculating Averages and Standard Deviations

The previously calculated normalized scores were used to determine the average and standard deviation of each block of stories.

For the Eastern against Eastern and Western against Western story blocks, only one half of the block was used to make these calculations because the blocks were mirrored over the self-matching diagonal. The normalized scores for each story were calculated by averaging the scores of the components of the pair, which resulted in the story pair of Story X and Story Y having the same normalized score as the story pair Story Y and Story X. Using this information, the averages and standard deviations of the Eastern against Eastern and Western against Western blocks were calculated by using the normalized scores of everything exclusively under the diagonal of self-matches. Table 2 shows an example of a normalized score table. The bold numbers along the diagonal represent the normalized scores of stories matched against themselves. The italicized numbers under the diagonal indicate the scores of the stories used in the averaging and standard deviation calculations.

For the Eastern against Western and Western against Eastern story blocks, the entire block was used to compute the average and standard deviation. Because these blocks were mirrors of each other, they both had the same average and standard deviation calculations.

Table 2: Sample of normalized Eastern against Eastern story scores.

	Story 1	Story 2	Story 3
Story 1	<b>1</b>	0.824	0.889
Story 2	<i>0.824</i>	<b>1</b>	0.837
Story 3	<i>0.889</i>	<i>0.837</i>	<b>1</b>

Table 3: Averages and standard deviations for normalized story blocks.

	Average	Standard Deviation
Eastern against Eastern	0.812	0.112
Western against Western	0.768	0.118
Eastern against Western	0.748	0.134
Western against Eastern	0.748	0.134

Table 3 shows the averages and standard deviations of each of the normalized score story blocks. Figure 5 is a graph of the average normalized story scores with standard deviation error bars.

### 4.3 Paired T-Statistic Test

To determine how statistically significant my results were, I ran the normalized scores through a paired T-statistic test.

First I calculated the variance by using equation 2.

$$\text{var}_e = \text{stdev}(e)^2 \quad (2)$$

Then I counted how many scores used for calculation were in each block,  $n$ . Using the variance and number of scores, I determined the standard error, SE, between two blocks. Equation 3 shows this calculation.

$$\text{SE}_{x,y} = \sqrt{\frac{\text{var}_x}{n_x} + \frac{\text{var}_y}{n_y}} \quad (3)$$

After finding the standard error, I calculated the differences in the averages of the two sets, equation 4, and calculated the T-distribution using equation 5.

$$\text{diff}_{x,y} = \text{average}_x - \text{average}_y \quad (4)$$

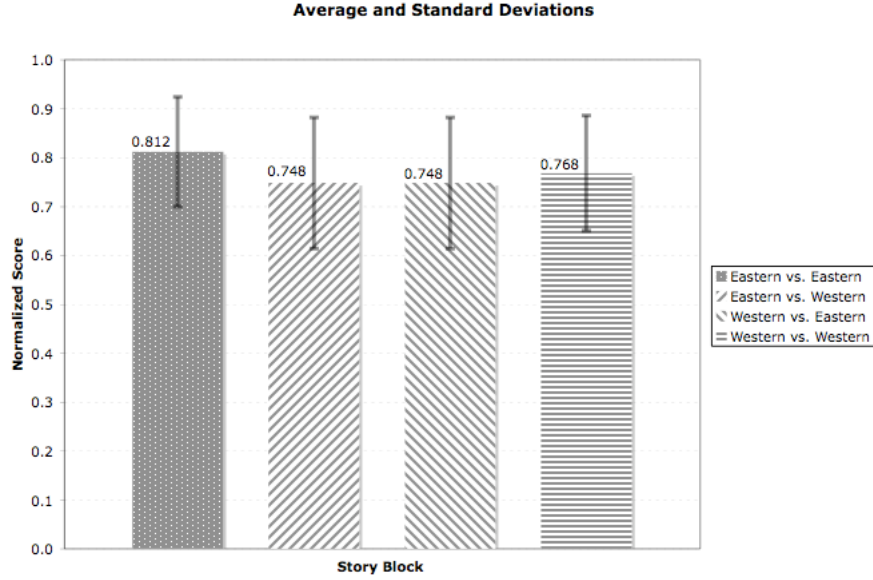


Figure 5: Averages and standard deviations for normalized story blocks.

$$T_{x,y} = \frac{\text{diff}_{x,y}}{\text{SE}_{x,y}} \quad (5)$$

To determine the statistical meaning of my results, I used the CHIDIST function to calculate the  $p$ -value using equation 6.

$$p_{x,y} = \text{CHIDIST}(T, n_x + n_y - 2) \quad (6)$$

Table 4 shows the results of my calculations. The range for  $p$ -values is from 0 to 1, with 0 being most statistically significant, and 1 being least statistically significant.

## 5 Discussion

The results of my experiment indicate that there is no statistical difference in the causal attribution between the Eastern and Western soccer stories that I analyzed. While the average of normalized scores is slightly higher for Eastern against Eastern and Western against Western stories, the  $p$ -value for each of my comparisons is 1.000, meaning that there is almost no statistical significance in the differences in my numbers.

Table 4: Standard error, T-distribution, and  $p$ -values for normalized story blocks.

	SE	$T$	$p$
Eastern against Eastern versus Western against Eastern	0.019	3.214	1.000
Western against Western versus Eastern against Western	0.022	0.916	1.000
Eastern against Eastern versus Western against Western	0.023	1.888	1.000

## 5.1 Analysis of Results

I do not believe that these statistically insignificant  $p$ -values are an indication that Easterners and Westerners make similar causal attributions. Instead, many different factors may have contributed to the result of this experiment, including the construction of the stories used in the experiment.

The stories authored for this experiment most likely contributed to the result of no statistical difference. While selecting articles to author into stories, I noticed that both Eastern and Western sports articles tended to make dispositional causal attributions, instead of the expected situational attributions for Easterners, and dispositional attributions for Westerners. Because of limited resources, the selection of publications to pick articles from was not well-balanced. I do not know any Eastern languages, so the Eastern sports articles were selected from online Eastern publications that had articles written in English. It is difficult to determine how these articles were written. The differences between an Eastern article directly translated to English by a bilingual speaker, an Eastern article written directly into English by an Easterner, and an Eastern article written directly into English by a Westerner living in East Asia, are hard to account for when selecting articles.

Experimenter bias also may have been introduced in this experiment. While using newspaper articles reduced the amount of experimental bias, the single-person conversion of articles to stories understandable by the Bridge Project opened another source of bias instead.

## 5.2 Future Work

Future work on this project will include a more thorough investigation of the attained results and why they did not support the current speculation that Easterners and Westerners make different causal attributions because of their cultural background. As I discussed earlier, a

possible route to look at would be the selection of publications as well as articles. I had tried to contact Fiona Lee, whose work showed that soccer articles were good sources of overdispositionalism and oversituationalism (Lee, 1996, [6]), but was unable to reach her. Contacting Lee and using the articles that she used in her own experiment to achieve positive results could be a possible avenue for future work. Other possibilities for future work might involve having multiple people author the stories to reduce experimenter bias. Constructing more stories would increase the number of possible stories to match, which might positively affect the statistical significance of the results.

Based on this work, different tests could also be constructed. This experiment analyzed the maximum scores assigned by the Bridge Project to each story pair. Another possible experiment might be to design a Bridge Project module that would take in a story and predict the ending, based on the facts in the story. The setup of the experiment would be the same, priming instances of the Bridge Project with culturally based story sets, but then feed both cultures an unfinished story and see what kind of causal attribution it determines.

## 6 Contributions

The completion of this project will contribute to the understanding of cognitive processes and how culture affects the way people think. In completing my portion of this project, I have contributed to the bigger goal of understanding human cognition.

- I have introduced the effects of culture on thought processes for people of Eastern descent and people of Western descent. Because precedents help people reason and precedents exhibit cultural influence, this lends strong support to the idea that culture affects how people think.
- I have illustrated the mixed model of attribution and how it has affected my approach to the design of the project. Using this mixed model, I chose to use sports articles as the basis of my data sets.
- I designed and carried out an experiment to test culturally biased causal attribution. By applying the analogical mapper of the Bridge Project, I calculated scores based on how similar story structures matched.
- Finally, while the results of my experiment were not supportive of my hypothesis about culturally-biased causal attribution, I have introduced other areas of future work, including more rigidly constructed stories and different tests. Further exploration of this project will help to build a better understanding of how culture affects human cognition, and how to avoid cultural conflicts based on this new understanding.

# Appendices

## A Sample of Western Bridge Project Story

Reyes is a player. Reyes is a part of Arsenal.  
Reyes is a superstar.

Arsenal attacked Tottenham because Tottenham attacked Arsenal.

Arsenal was strong because Reyes was a superstar and Reyes scored a goal.  
Arsenal defeated Tottenham because Arsenal was strong.

## B Sample of Eastern Bridge Project Story

Juninho is a player.  
Juninho is a superstar.  
Juninho is a part of Frontale.

Grampus attacked Frontale because Frontale attacked Grampus.  
Frontale was weak because Juninho was a superstar and Juninho was injured.  
Grampus defeated Frontale because Frontale was weak.

## References

- [1] Barclay, G. and Tavares, C., “International comparisons of criminal justice statistics 2000”, <http://www.homeoffice.gov.uk/rds/pdfs2/hosb502.pdf>, 2000.
- [2] Chen, Z. *et al.*, “Having the memory of an elephant: Long-term retrieval and the use of analogues in problem solving”, *Journal of Experimental Psychology*, 415-433, 2004.
- [3] The Genesis Group, <http://genesis.csail.mit.edu/>, 2004.
- [4] Gentner, D., “Structure-Mapping: A theoretical framework for analogy”, *Cognitive Science*, 7, 155-170, 1983.
- [5] Krull, D., “Does the grist change the mill? The effect of the perceiver’s inferential goal on the process of social inference”, *Personality and Social Psychology Bulletin*, 340-348, 1993.
- [6] Lee, Fiona *et al.*, “Explaining real-life events: How culture and domain shape attributions”, *Personality and Social Psychology Bulletin*, 732-741, 1996.
- [7] Morris, M. and Peng, K., “Culture and cause: American and Chinese attributions for social and physical events”, *Journal of Personality and Social Psychology*, 949-971, 1994.
- [8] Nisbett, Richard E., *The Geography of Thought: How Asians and Westerners Think Differently...and Why*, 2003.
- [9] Norenzayan, A., Choi, I., and Nisbett, R., “Cultural similarities and differences in social inference: Evidence from behavioral predictions and lay theories of behavior”, *Personality and Social Psychology Bulletin*, 2002.
- [10] Ullman, Shimon *et al.*, “Visual features of intermediate complexity and their use in classification”, 2002.