ANALOGY AND MORAL DECISION MAKING

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ABSTRACT

It is well known that analogy plays an important role in the process of decision making. However, this role has not yet been systematically examined in the domain of moral decision making. This paper investigates the role of cultural narratives in understanding novel moral situations. We examine whether the processes by which core cultural narratives are applied in people's lives follow the principles of analogical retrieval and mapping. In particular, we examine how analogical accessibility and alignability influence the use of canonical moral narratives. We also show how access to different moral stories results in differences in moral preference across cultures. We report on the results of two experiments performed among Iranian and American participants. Our results indicate that analogical accessibility to cultural narratives that are similar in structure to a given dilemma is the differentiating factor in our participants' responses across the different variants and between the two cultural groups.

INTRODUCTION

The link between analogy and decision-making has been explored from various perspectives, including consumer behavior (Gregan-Paxton, 1998), political reasoning (May, 1973) and legal decision-making (Holyoak and Simon, 1999). Goldstein and Weber (1995) argue that the process of decision making is a constructive process in which the decision maker relies extensively on his/her background knowledge and previous experiences. Medin et al. (1995) demonstrate that similarity processing and decision making share important commonalities. These correspondence and parallels suggest common mental processes for the two tasks. When making a choice, the decision maker recognizes the current situation as analogous to some previous experience and draws inferences from his/her previous choices (Markman and Medin, 2002). Petkov and Kokinov (2006) illustrate how structure mapping (Gentner, 1983) can account for many contextual effects in decision making. Moreover, Kokinov (2005) demonstrates the use of analogy in risky decision making, showing how experiencing a single episode of success in risky decision making biases participants towards taking more risky decisions.

Judgment and decision making researchers, on the other hand, have highlighted a number of ways in which culture may influence decision making. Specifically, Weber and Hsee (1998) argue for the importance of cultural products, such as proverbs, in people's decision making. One type of cultural product that may underlie culturally specific moral values is core cultural narratives. Certain elements of moral reasoning can be best learned and transferred in narratives, as they are not common situations encountered in daily life. Great cultural narratives, such as those contained in most religious texts or in folk stories, can deeply imprint our long term memory, whether or not we ever encounter these situations in real life. It is not implausible to think

that those values seep into our beings and affect our reasoning.

In this work we investigate whether cultural narratives guide people's moral decision making. That is, whether moral reasoning is influenced by analogies with the core narratives. If so, then moral reasoning should manifest the keynote phenomena that characterize analogical processing. We focus on whether analogical accessibility influences the use of canonical moral narratives and shapes our understanding of novel moral situations. Additionally, we examine how access to different moral narratives can result in differences in moral preference among cultures.

We begin by summarizing relevant results on moral decision making. Next, we discuss the role of similarity in long-term memory retrieval. Then we explain our hypotheses and describe our experiments. We close with implications and future work.

MORAL DECISION MAKING

Morality as a topic of experimental scientific inquiry has attracted the attention of psychologists for more than eight decades. A typical task provides participants with a moral dilemma, such as someone having to steal medicine to save his wife, and examines the choice they make and the justifications given for it. In many cases participant choose actions which are disassociated from prospects for success, for example choosing not to steal no matter what the consequences. The conflict between rational outcomes and intuitive judgments given by many participants sparked the initial interest in moral decision making.

Most of the work that has been done looking at cross-cultural differences in morally-motivated decision making has been ethnographic in nature. Shweder et al. (1997) and Haidt et al. (1993) have identified domains of moral decision making that are present in one cultural group but not in another. Domains such as respect for authority and the saliency of the distinction between purity and impurity are some that have been identified in helping people to characterize certain situations as morally tinged within one cultural group but not another.

Next we talk about how an event, for example a moral dilemma, can cause the retrieval of similar event from the long-term memory.

SIMILARITY, RETRIVAL AND ALIGNMENT

In our studies we varied the kind of similarity between the target given to the participants and the core cultural story (which is never presented). The first question is how similarity between the target story and the core story will influence reminding of the core story. In general, surface similarity is the best predictor for whether a current target story will retrieve a given base story from LTM; and structural similarity is the best predictor for inference (Forbus et al,. 1994; Gentner et al, 1993; Holyoak & Koh, 1987). However, structural similarity can also influence retrieval of prior cases. Structural retrievals are more likely among domain experts than among novices (Novick, 1988); and more likely among learners who have previously compared the base story to another analogous story (Gick & Holyoak, 1983; Gentner et al, 2003). (Of course, these phenomena may be related).

Because cultural narratives are deeply entrenched as part of oral culture, participants are likely to have heard and compared various versions, resulting in a somewhat schematized encoding (see Gick & Holyoak, 1983; Gentner, et al. in press). Therefore, the retrieval rate of these stories may be relatively less dominated by surface similarity than is typically found in experimental situations (see also Blanchette & Dunbar, 2000). Thus the question for retrieval is (a) whether Iranians will show remindings to the core cultural story; and, if so, (b) whether their reminding will be influenced by surface similarity, structural similarity, or both.

The second set of questions and predictions concern inference. Assuming that the core narrative is accessed, in order to draw inferences, it must first be aligned with the target story (Colhoun & Gentner, 2009; Clement & Gentner, 1991; Markman, 1997). The

correspondences created by this alignment are used to import knowledge from the base representation into the target. Thus, if analogy is operative, then Iranians should make more inferences from the core narrative for targets that are structurally alignable with the core narrative.

EXPERIMENTS

We suggest that some important elements of moral reasoning are learned and retained in cultural narratives, and that these cultural narratives play a role in understanding novel moral situations. Further, we suggest that the processes by which these narratives are applied in people's lives follow the principles of analogical retrieval and mapping. That is, we argue that by using analogy we apply a moral theme, a certain relational structure from one domain (that of the cultural narrative) to a novel, but structurally similar domain. In sum, our chief prediction is that, for Iranians, moral reasoning should abide by the key constraints of analogical processing: that is, structural similarity to the core narratives should guide inference. Of course, we predict no such pattern for Americans, because the stories are designed to match core Iranian narratives. With respect to retrieval, the question is whether Iranians will show the typical pattern (that is, surface similarity as the main predictor of retrieval), or whether they will show the pattern characteristic of experts (of structural similarity also as a strong predictor of retrieval). A key feature of these studies is that the base domain (the cultural narrative) is never presented to participants. We are predicting that such narratives are sufficiently entrenched in the minds of members of the culture that no presentation is necessary.

We focus our studies on the notion of sacrifice. The idea of sacrifice is embedded in narratives of many cultures, with great saliency in some cultures—in particular, the Iranian culture that concerns us here. As Prasad (2007) notes, such narratives can have great power in a culture. Moreover, she argues that the way in which cultural narratives about morality are interpreted and reinterpreted at every telling is instrumental in the complex nature of moral reasoning.

In order to compile a list of salient stories for a given culture, we performed an Internet-based pilot study using 199 Iranian participants. Among other questions, participants were asked to list the top 10 cultural and religious moral stories they could think of. Based on participants' answers, we compiled a list containing the most referred to non-religious and non-political narratives. Next, for each of these narratives, we developed four different variants: surface changes relative to the base scenario; structural changes; both surface and structural changes; and changes that affect the core cultural values (sacred values) that underlie the narrative. In the latter case, the prediction was that an alteration of the core sacred values should decrease structural similarity. In all variations, we tried to leave the choice of action unchanged, and only vary the intention of the agents or the information provided in the scenario.

Our hypotheses are that for Iranians, (1) changing the surface structure of the scenarios should still allow inference from the original cultural stories, while changing the deep structure should block the inference; (2) the rate of retrieval of cultural narratives should vary based upon the degree of surface similarity and also (because of schematization) structural similarity with the new scenario; (3) Americans, who lack these cultural narratives, should show no difference between these variations.

Experiment 1

To test these questions, we created story variants for the following cultural narrative, prominent in Iranian culture:

Base Story:

Pourya Vali was the most famous wrestler of his time. The morning before wrestling with a young athlete from another province, he goes to a mosque and sees the mother of the young athlete praying and saying "God, my son is going to wrestle with Pourya Vali. Please watch over him and help

him win the match so he can use the prize money to buy a house". Pourya Vali thinks to himself that the young wrestler needs the money more than he does, and also winning the match will break the heart of the old mother. He has two choices, he can either win the match and keep his status as the best wrestler in the world or he could lose the match and make the old mother happy. Even though he was known not to ever lose a match, he loses that one on purpose.

Surface change (ΔSF):

Ali is the greatest ping pong player of his city. The morning before a match with a young athlete from another city, he goes for a walk outside the stadium and sees the mother of the young athlete praying and saying "God, my son is going to play a match with Ali the famous ping pong player. Please watch over him and help him win the match so he can use the prize money to get married". Ali has two choices, he can either win the match and keep his status as the best ping pong player or he could lose the match and make the old mother happy.

Structure change (ΔST):

Ali was the most famous wrestler of his city. The morning before wrestling with a young athlete from another province, he goes to a mosque and sees the mother of the young athlete praying and saying "God, my son is going to wrestle with Ali. Please watch over him and help him win the match so he can use the prize to buy me new expensive clothes". Ali has two choices, he can either win the match and keep his status as the best wrestler in the world or he could lose the match and make the old mother happy.

Surface + Structure change (ΔSS):

Ali is the greatest ping pong player of his city. The morning before a match with a young athlete from another city, he goes for a walk outside the stadium and sees the mother of the young athlete praying and saying "God, my son is going to play a match with Ali the famous ping pong player. Please watch over him and help him win the match so he can use the prize money use the prize to buy me new expensive clothes". Ali has two choices, he can either win the match and keep his status as the best ping pong player or he could lose the match and make the old mother happy.

Sacred Value Change (ΔSV):

Ali was going to wrestle against the most famous wrestler of his city. The morning before the match, he goes to a mosque and sees the mother of the famous athlete praying and saying "God, my son is going to wrestle with young Ali. Please watch over him and help him win the match so he can keep his status as the best wrestler in the world". Ali has two choices, he can either win the match and beat the best wrestler in the world or he could lose the match and make the old mother happy.

After reading one of these dilemmas, the participants were asked the following questions:

1. What should Ali do?
   a. Win the match
   b. Lose the match and make the old woman happy
2. What narrative does this scenario remind you of?
3. If it reminds you of any narratives, please list the similarities between the two.
4. Please list the differences between the two.

Choice 'a' in question 1 corresponds to the utilitarian choice, that is the choice that brings the highest overall utility to the agent. Choice 'b' represents the choice involving sacrifice, where the agent disregards his own immediate utility for the betterment of others. The control group received English translations of the above scenarios with the changes in the names, sports and the locations such that they would be more familiar to American audiences (e.g., Andrew instead of Ali, tennis instead of wrestling, etc.).

Method

364 participants in Iran (mean age = 18.67; Female/Male: 191/173) completed our questionnaire. These participants were either students at University of Tehran or enrolled in the college preparation course (4th year of high school). The control group was 48 Northwestern undergraduates (mean age = 18.91; Female/Male: 28/20). Each participant received one target variant (randomized across subjects). For the Iranian participants, the answer to the second question was coded as a recall

only when they recalled the cultural narrative. However, for the control group a recall was coded when they indicated any story retrieved from LTM (including children's stories, movie plots, etc.) as the base stories are not known by the Americans. The answers to questions 3 and 4 were coded using the following scheme: if participants reported attribute similarities/differences to/from the base, these were coded as surface similarities/differences, whereas functional/relational similarities/differences were reported as structural similarities/differences. Translations were done by independent translators.

Results

The proportion of sacrificial choices (choice b) to the total number of selected choices for each variant is reported in Table 1. As predicted, Iranians who received the ΔSF target were highly likely to make the sacrifice inference. Those receiving ΔSS were also highly likely to make this inference. There was a significant difference between the following variants: ΔSF and ΔST ($\chi^2 = 6.53$, $df = 1$, $p < 0.01$), ΔSF and ΔSV ($\chi^2 = 4.38$, $df = 1$, $p < 0.05$), ΔST and ΔSS ($\chi^2 = 5.81$, $df = 1$, $p < 0.05$) and ΔSS and ΔSV ($\chi^2 = 3.79$, $df = 1$, $p < 0.05$). For the control group, there were no significant differences among the variants[1].

Among Iranian participants who reported structural similarities to the core narrative, a larger number chose the sacrificial choice (N = 66) than the utilitarian choice (N = 6) ($\chi^2 = 96.69$, $df = 1$, $p << 0.001$). However, among those reporting structural differences, a larger number chose the utilitarian choice (N = 20) than the sacrificial choice (N = 8) ($\chi^2 = 8.64$, $df = 1$, $p < 0.005$). In the other direction, among the Iranians who chose the sacrificial choice, a significantly larger number reported structural similarities to the cultural narrative (N = 66) than reported surface similarities (N = 32) ($\chi^2 = 17.30$, $df = 1$, $p << 0.001$). Among Iranians who chose the utilitarian choice, the reverse held: a significantly larger number reported structural differences (N = 20) rather than surface differences (N= 2) ($\chi^2 = 18.70$, $df = 1$, $p << 0.001$). Note that even those who chose the utilitarian option still mostly made reference to the cultural narrative.

Table 1: Proportions of sacrificial choices to total number of selected choices for Experiment 1

	ΔSF	ΔST	ΔSS	ΔSV
Iranian Group	0.83	0.65	0.82	0.68
Control Group	0.07	0.00	0.00	0.00

The total and conditional retrieval rates (question 2) are reported in Table 2. The retrieval results show dependence on both surface and structural similarity. Surprisingly, the variant with surface changes (ΔSF) led to the best retrieval rate (66%), significantly better than the ΔSV variant (43%) ($\chi^2 = 8.68$, $df = 1$, $p < 0.005$). The ΔSF variant also led to more retrievals than the ΔSS situation (66%) ($\chi^2 = 3.65$, $df = 1$, $p = 0.05$)—surprisingly, in that the ΔSS variant has *both* surface and structural differences from the core narrative.

However, in the expected direction, those in the ΔSS condition reported a larger number of alternate stories (31%) than did those in the ΔSF condition (12%) ($\chi^2 = 4.52$, $df = 1$, $p < 0.05$).

Among the Iranians who were reminded of the core story, a significantly larger number of participants chose the sacrificial choice (choice b) (76%) than chose the utilitarian choice (20%) ($\chi^2 = 157.53$, $df = 1$, $p << 0.001$).

Among the control group, four participants recalled a story: Two of the four mentioned pop-culture movies and the other two referred to other stories used in the experiment. Logistic regression revealed a significant difference in the trend of answers to these vari-

[1] A power test revealed that even had there been the same number of subjects in the American group as in the Iranian group, the probability that all of the above differences would hold among the Americans would have been very low (less than 2.5% for the first experiment and less than 5% for the second experiment).

ants between the Iranian participants and the control group (z = -3.868, p << 0.001).[2]

Table 2: Retrieval rates of the core narrative for Iranians in Experiment 1

Alternative Chosen	ΔSF	ΔST	ΔSS	ΔSV
Utilitarian	0.11	0.20	0.09	0.10
Sacrificial	0.55	0.36	0.42	0.33
Total	0.66	0.56	0.51	0.43

Discussion

As predicted, Iranians were highly likely to draw the inference suggested by their core narrative, especially when they could align the structure of the target with that of the core narrative. Also as predicted, Americans (who lack this core narrative) showed no such pattern; there were no differences among the variants.

Although the overall pattern for Iranians—particularly for the conditional probabilities—strongly suggests that cultural narratives were important in their decisions, there were some puzzling findings. In retrieval, the ΔSF variant led to same number of retrievals of the cultural narrative as ΔST (p = 0.2), contrary to the usual finding that retrieval depends most on surface similarity. In inference, while we found the expected pattern—fewer sacrificial inferences when the structure was changed (ΔST and ΔSV) than when only the surface was changed (ΔSF)—we also found a high rate of sacrificial inferences when *both* structure and surface were changed (ΔSS).

We suspect that this pattern is driven in part by fact that, as mentioned earlier, there are several other cultural stories similar to the Pourya Vali story. These acted as competition during memory retrieval, or might have blended with the Pourya Vali story, so that when both surface and structure were modified (ΔSS), many Iranians were reminded of other stories that have surface and structural resemblance to the ΔSS variant. In fact, many Iranians were reminded of other stories that have surface and structural resemblance to the ΔSS variant (chiefly a moral story about another wrestler and a moral story about a running match). Because these stories also laud the value of sacrifice, retrieval of these stories may have contributed to the many sacrificial answers for the ΔSS variant.

This raises the possibility that the results stem solely from general societal values, and that the analogies were irrelevant. However, against this is the finding that Iranians' choices were strongly connected to whether they found structural commonalities with the cultural base story (in which case they chose sacrifice) or instead found structural differences. Among those who chose the utilitarian choice, significantly more Iranians reported structural differences than reported surface differences from the core story. Thus, even those Iranians who chose the utilitarian option mostly did so by reference to the cultural narrative; they simply considered the structural differences sufficiently serious as to block the analogous inference.

There was no significant difference between ΔST and ΔSV, indicating that a change in sacred values, in this case swapping the roles of the actors, had effects similar to a change in structure. In the Vali story, a person in powerhelping someone in need by sacrificing his status is considered the moral message of the story.

In conclusion, the results of the first experiment offer some support for the claim that analogical mapping from a cultural moral story to a current dilemma affects participants' decision making when faced with moral dilemmas. The trend of sacrificial decision making among the Iranian participants depended on whether the probe could be structurally aligned to the base moral narrative or not. Because the American control group did not have access to the cultural narrative, structural differences between the variants did not affect their decision making. Of course, it is also possible that

[2] An ANOVA power test suggests that the difference would remain significant if there were an equal number of subjects in both groups.

Americans may have experienced a different cultural value, that of observing the rules of the game. If so, then they may also have been acting in accord with a set of core values, though not the same set as the Iranians. Future research will investigate this possible difference in core values.

The findings for the ΔSS variant differed somewhat from predictions. We suspect that this may have resulted from the large number of close variants of the wrestler story that exist in Iranian culture. Therefore, in Experiment 2, we used a cultural narrative that has a single dominant form. In the second experiment, we examine the effects of a more recent cultural story on people's decision making.

Experiment 2

In this experiment we used another famous Iranian story which is a required reading in the third grade school book of all Iranian children. Therefore, compared to the last story which is usually told by parents to children and therefore each child might hear a slightly different version of it, we can assume that all the participants know the same version of this story. In order to pinpoint the differences between ΔSF, ΔST and ΔSS, only three different variants were used.

Base Story:

A farmer is returning home from a day of work carrying an oil lamp. He notices that as the result of a landslide, parts of a railroad just outside of a tunnel has been covered with stones. He walks passed the tunnel and realizes that a train is heading towards the tunnel. The farmer has two options, he can either try run to the station on time and inform the station manager and save his own life, or he can put his coat on fire, stand in the way of the train, risk his life and try to signal the train. He chooses the second option and saves the lives of many people.

ΔSF:

A man is going to work carrying a flashlight. He notices that as the result of an earthquake, a bridge has collapsed. He walks passed the bridge and realizes that a bus is heading towards the tunnel. He has two options: he can either try to run to the station on time, inform the station manager and save his own life, or he can use his flashlight, stand in the way of the of the bus, risk his life and try to signal the bus.

ΔST:

A farmer is returning home from a day of work carrying an oil lamp. He notices that as the result of a landslide, parts of a railroad just outside of a tunnel has been covered with stones. He walks passed the tunnel and realizes that a train is heading towards the tunnel. The farmer has two options, he can either try to run to the station on time and have the station manager reroute the train, or risk his life, by standing on the tracks, which will make him famous in his town and he would potentially receive a cash prize.

ΔSS:

A man is going to work carrying a flashlight. He notices that as the result of an earthquake, a bridge has collapsed. He walks passed the bridge and realizes that a bus is heading towards the tunnel. He has two options: he can either try to run to the station on time and have the station manager reroute the train, or he can use his flashlight, stand in the way of the of the bus, risk his life and try to signal the bus, which will make him famous in his town and he would potentially receive a cash prize.

After reading one of these dilemmas, the participants were asked similar questions to those asked in experiment one, with only the first question being different:

1. What should the man do?
   a. Run to the station
   b. Risk his own life

The control group received exact translations of the above scenarios.

Method

The participants and materials were the same as in Study 1.

Results

Overall, the results were closely in line with the predictions derived from analogical research. For inference, as show in Table 3,

Iranians who received the ΔSF variant –which preserves the relational structure of the core narrative—were more likely to choose the sacrificial option than those who received the ΔST variant (χ^2= 18.05, df = 1, $p << 0.001$) or the ΔSS variant (χ^2 = 33.25, df = 1, $p << 0.001$). For the control group, there were no significant differences between the different variants[1].

Table 3: Proportions of sacrificial choices to total number of selected choices for Experiment 2

	ΔSF	ΔST	ΔSS
Iranian Group	0.83	0.56	0. 47
Control Group	0.46	0.37	0.48

The results for retrieval (question 2) accord with predictions from analogy research in showing the large importance of surface similarity matches for retrieval. The total and conditional retrieval rates are shown in Table 4. Iranians who received variants low in surface similarity to the core narrative—either the ΔSF variant (88%) or the ΔSS variant (86%) showed significantly lower retrieval of the core narrative than did those who received the ΔST situation (98%) (χ^2 = 6.42, df = 1, $p < 0.05$ and χ^2= 9.27, df = 1, $p < 0.01$, respectively).

As in Study 1, among participants who noted structural similarities with the core narrative, a larger number chose the sacrificial choice (N = 46) than the utilitarian choice (N = 19) (χ^2 = 15.80, df = 1, $p << 0.001$). However, if participants reported structural differences, a larger number chose the utilitarian choice (N = 79) than the sacrificial choice (N = 57) (χ^2 = 6.48, df = 1, $p < 0.01$). In the other direction, among the Iranians who chose the sacrificial option, a significantly larger number reported structural similarities to the base (N = 46) rather than surface similarities (N = 19) (χ^2 = 15.81, df = 1, $p << 0.001$). Furthermore, among participants who chose the utilitarian option, a significantly larger number reported structural (N = 79), rather than surface (N = 8), differences from the base (χ^2 = 123.37, df = 1, $p << 0.001$).

Among the control group, 16 participants recalled a story: 11 of the 16 were reminded of other stories used in the experiment and the rest were reminded of pop-culture movies. Logistic regression revealed a significant difference in the trend of answers to these variants between the Iranian participants and the control group (z = -2.18, $p < 0.05$)[2].

Table 4: Retrieval rates of the core narrative for Iranians in Experiment 2

Alternative Chosen	ΔSF	ΔST	ΔSS
Utilitarian	0.11	0.42	0.46
Sacrificial	0.77	0.56	0.41
Total	0.88	0.98	0.87

Discussion

Among the Iranian participants, Experiment 2 showed a clear difference between ΔSF and ΔST/ΔSS variants: participants more often chose the sacrificial option for the ΔSF variant than they did for the ΔST or the ΔSS variants. This follows our prediction that people draw inferences suggested by their core narratives when they can be structurally aligned. For the Iranians, analogical inference from a base moral narrative seems to have been the key process when they were presented with the moral dilemmas.

In this study, retrieval mainly depended on surface similarity, conforming to the patterns found in laboratory studies (Gentner et al., 1993; Reeves & Weisberg, 1994; Ross, 1989) (and in contrast to the pattern in Study 1). This difference may be due to the difference in cultural patterns for the two stories. As mentioned above, the Study 1 story exists in many versions used in different contexts across the culture, whereas for the Study 2 (farmer) story we can safely assume that all of our Iranian participants know the very same version of the farmer story. Furthermore, the farmer story is mainly used in a single context. Thus, we speculate that this story had fewer near competitors during retrieval from LTM. As a result, surface similarity played a more important role in retrieval than structural relations.

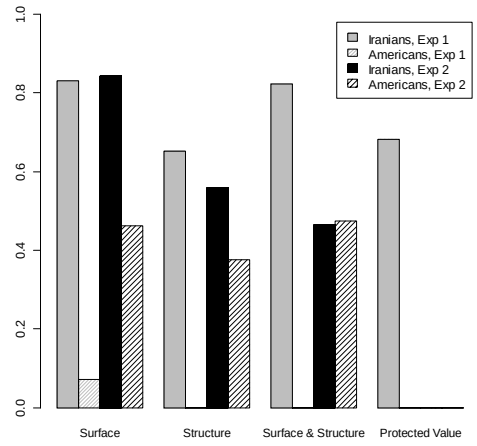

Figure 1. Proportions of Sacrificial Answers

The Americans made more sacrificial choices in the second experiment than they did in the first (χ^2 = 20.84, *df* = 1, $p << 0.001$). This may be because that the rate of recall among American participants was higher in the second experiment than it was in the first (they were often reminded of different movies).

GENERAL DISCUSSION

The results of our experiments suggest that analogical mapping from core cultural narratives can influence moral reasoning about current moral dilemmas. Supporting the hypothesis that analogical processing occurs during moral decision making, our results manifest some of the keynote phenomena that characterize analogical processing: (1) changes to surface structure of the scenarios did not affect inference from the original cultural stories, once they were retrieved, while changing the deep structure blocked the inference; (2) especially in Study 2, the rate of retrieval of cultural narratives varied based upon the degree of surface and structural similarity with the presented dilemma. One difference from laboratory studies was the very high rate of retrieval overall. We conjecture that this high retrieval rate stems from the importance of the narratives in Iranian culture, as well as from their frequent repetition and schematization (Blanchette and Dunbar, 2000; Gentner et al., in press).

Also as predicted by the analogical account, these effects were seen only for Iranians, not for Americans, consistent with the claim that the effects stem from core narratives of the Iranian culture. In future, we plan to run the reverse study, using well known American moral narratives, such as the 'cannot tell a lie' narrative for Washington, in experiments in Iran.

Our results suggest that a core differentiating factor in moral reasoning between cultures may be familiarity with different collections of cultural narratives. Even if the foundations and the logic of morality were universally present, the different cultural stories would cause differences in the judgment of morality between cultures. We believe some well known findings on moral reasoning might be explained by formal examination of moral narratives present within and across cultures.

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