The role of intentionality in causal attribution is culturally mediated: evidence from Chinese, Mayan, and Spanish populations

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Abstract

Speakers of Mandarin, Spanish, and Yucatec Maya watched videos of two actors involved in a causal chain initiated by one of them. After watching each video, participants divided 10 tokens into piles indicating their assignment of responsibility for the resulting event. There was a significant interaction between intentionality and population: causer and causee intentionality made a significant difference only for the Spanish and Yucatec participants, but not for the Chinese participants. This is in line with previous findings suggesting that internal dispositions play a lesser role in responsibility attribution in societies in which attention to individual agency is far more common than attention to group agency.

Keywords: causality; agency; responsibility; intentionality; cultural mediation; linguistics; social psychology

Introduction

Linguistic theories of the mapping between meaning and syntactic form in language have long recognized the key role of agency and causality. In verbal representations of causal chains, causality and agency determine the assignment of grammatical relations such as subject and object, voice (active/passive), case marking, and a host of other properties (e.g., Croft 1987; Dowty 1991; Foley & Van Valin 1984; among many others). Yet, much of this work implicitly treats causality and agency as universal notions – even in crosslinguistic research (e.g., Comrie 1981; Dixon 2000; Shibatani 2002). Meanwhile, a growing body of work in the field of social psychology calls the universality of these notions very much into question.

Take, for example, the nexus between responsibility and intentionality. Much theoretical work on agentivity in language assumes that prototypical agents are volitional and that nonvolitional causers are either atypical agents or not agents at all (Dowty 1991; Lakoff 1977; Van Valin & Wilkins 1996; *inter alia*). [We assume in the following that volitional actions require a *choice* on the actor's part and intentional actions require a *plan*; the latter are thus a subset of the former (cf. Van & Valin & Wilkins 1996: 315-316)]. However, cross-cultural research since the 1990s has uncovered evidence suggesting that internal dispositions such as volition and intentions do not play the same role in attributions of causality across cultures. Much of this research has focused on a contrast (treated as binary) between two types of societies that are said to differ from one another in terms of the relative prominence of individual agency and group agency in their members' cognition. American culture has been said to downplay collective agency in favor of individual agency. We assume that our Spanish participants exhibit the same trait. In contrast, group agency is hypothesized to play a relatively more prominent role in Chinese culture.

For example, in one classic study, Morris & Peng (1994) examined reports of similar crimes in Chinese- and English-language newspapers, showing that the former paid relatively more attention to explanatory factors in the situational context of the crime while the latter spent more time discussing the perpetrator's presumed disposition. Similar patterns have been reported, with varying theoretical conclusions, by Chiu et al (2000); Choi & Nisbett (1998), Choi et al (1999), Maddux & Yuki (2006); Menon et al (1999), and Peng & Knowles (2003), *inter alia*.

If the attribution of responsibility and causality is indeed influenced by culture-specific folk theories of agency, then such folk theories may also influence the role of agency in the grammars of different languages. We are currently laying the groundwork for a large-scale crosslinguistic study of the representation of causality in the grammars of languages spoken around the world. In preparation for this effort, we decided to directly investigate the role of intentionality in causal attributions in three populations: Mandarin Chinese speakers from Mainland China, Spanish speakers from Spain, and Yucatec Maya speakers from Mexico. Mayans practice a traditional Mesoamerican horticulturalist society surrounded by a Western-dominated Spanish-speaking society and transitioning into the Age of

Globalization. Their inclusion in our study allows us to open up the investigation beyond the egocentric-sociocentric dichotomy of the debate on 'dispositionalism' and 'situationalism' in social psychology, but also to compare our findings to those reported in Le Guen et al (2015), whose sample includes Yucatecans as well.

Le Guen et al (2015) investigated the role of concepts of chance and coincidence in causal attributions among four populations, comparing Tseltal and Yucatec Mayans, urban Mexicans of non-indigenous descent, and Germans. They based their stimuli on Alicke's (2000) 'Culpable Control Model', which distinguishes three components of responsibility: whether the causer intended their immediate action ('I→A'), whether they intended the final outcome ('I→O'), and whether there is a causal relation between the action and the outcome ('A→O'). The distinction between I→A and I→O informed our stimulus design as well. Le Guen et al found that intentionality had a greater effect on the Mayan participants' attributions of causality than on those of the German and Mexican populations. By way of interpretation, they tacitly point toward the tradition of anthropological research identifying elements of 'magical thinking' in traditional non-Western cultures (e.g., Evans-Pritchard 1937).

Method

Speakers of Mandarin, Spanish, and Yucatec Maya watched videos of two actors involved in a chain of events that culminates in a resulting event. In each case, the chain is initiated by one actor, dubbed the Causer in the following. The second actor is affected by the Causer's action and may or may not in turn affect a third, inanimate, entity. This second actor is labeled the Causee After watching each video, participants divided 10 tokens into piles indicating their assignment of responsibility for the resulting event. Piles represented 'Causer', 'Causee', and 'Neither'.

Participants

12 speakers of Yucatec Maya, 16 Mandarin speakers, and 20 Spanish speakers were recruited from and tested at sites in Barcelona and Murcia, Spain, at Beihang University in Beijing, China, and in the village of Yaxley, Quintana Roo, Mexico. The Chinese participants included 8 women and 8 men aged 19-40 (M = 27.46, SD = 4.98). Spanish participants included 12 women and 8 men aged 18-55 (M = 28, SD = 12.92). The Yucatec participants included 5 women and 7 men aged 18-76 (M = 44, SD = 16.83). Participants completed the tasks in about 45 minutes and were compensated 100 pesos (approximately $5 USD), 8 euros (approximately $9 USD), and a cup of coffee, respectively (all Mandarin participants were students of the school of foreign languages at Beihang University).

Materials

The experiment comprised a training phase involving 10 video clips and a test phase with 24 video clips. Four of the training clips and three of the test items were cut from news reports, a home video show, and a movie. The remaining videos were taped with students and faculty of the University at Buffalo Linguistics Department staging the actions and events. The mean duration of the test videos was 8.05 seconds (SD 4.56s). They were shown to the participants on laptop computers.

The test items are described in Table 1 in terms of the action/event involving the Causee. These actions/events can all in one way or another be understood as caused by the Causer – in some cases via a physical impact on Causee; in others via a reflexive/uncontrolled or deliberate psychological response to the Causer's behavior or as a response to a gestural command by Causer. Three intentionality variables are represented as well: whether Causer intended their action (I→A), whether Causer intended the outcomes of the chain (I→O), and whether Causee acted intentionally/volitionally.[1]

Table 1: Test Phase Video Descriptions

Clip Description (CE=Causee)	Causer intentional		Causee intentional
	I→A	I→O	
CE breaks a plate	Yes	Yes	Yes
CE breaks eggs	Yes	Yes	Yes
CE collapses a cup tower	Yes	No	No
CE collapses a cup tower	Yes	Yes	No
CE collapses a cup tower	Yes	Yes	No
CE cuts a piece of paper	Yes	Yes	Yes
CE falls	Yes	Yes	No
CE falls	No	No	No
CE falls	No	No	No
CE is scared/falls over	Yes	Yes	No
CE is startled	No	No	No
CE is thrown a distance	Yes	Yes	No
CE laughs	Yes	Yes	No
CE leaves	Yes	No	Yes
CE leaves	Yes	Yes	Yes
CE sits down	Yes	Yes	Yes
CE swings a swing	Yes	Yes	Yes
CE tears a piece of paper	Yes	Yes	Yes
CE tears a piece of paper	Yes	Yes	No
CE tears a piece of paper	No	No	No
CE tears a piece of paper	Yes	Yes	No
CE tosses a ball into a box	Yes	Yes	Yes
CE wakes	Yes	No	No
CE yawns	No	No	No

[1] Items that are represented in terms of the same description and configuration of variables in Table 1 differed from one another in terms of 1) the use of an instrument by the Causee, 2) for unintentional Causees, the medium of interaction between the Causer and the Causee (physical (e.g., pushing) vs non-physical (e.g., yelling loudly to startle) manipulation). The impact of these further variables has not yet been analyzed.

Figure 1: Causee leaves when causer sings poorly

Figure 2: Causee knocked into cups by causer with cart

Intentionality was indicated by obvious body language on the part of the actor, including whether or not they looked at the causee or touched them with their hands in a manner that appeared to be controlled. For example, in an 'unintentional' clip, a Causer walks into a room without looking at the causee and loudly sneezes, which causes a startled Causee to tear a piece of paper. In the contrasting 'intentional' clip, the Causer looks at the Causee and deliberately pushes them, causing them to tear the paper. Four of the training items featured scenes that fit the same parameters as the test items. The remaining six items featured actions on which the two actors collaborate, events that occurred without the involvement of either actor, and events in which one actor destroyed an object while the other looked on.

Participants were given 10 identical tokens, which consisted of small glass stones or other objects of similar size. To prevent confusion about the purpose of the task, no tokens resembling currency were used. These tokens represented total responsibility for end results in video clips observed during the task, where each token symbolized 10% of total responsibility. Participants were also given a sheet of paper with three circles drawn on it. The leftmost circle represented the actor who ended in the left-most position or final frame of the video clip, the center circle represented the other actor, and the right-most circle represented 'neither actor.' Circles were arranged in a horizontal row, or in two rows where the two circles representing actors were next to

one another in the top row and the 'neither' circle was drawn below them.

Procedure

Preparation. Prior to working with participants, researchers established how to convey the concept of responsibility in the target language. A complication of concern was the potential for negative implications of 'blame'. To avoid participant confusion over assigning blame to a neutral event, researchers explained that participants should think of assigning responsibility in terms of explaining the events to someone who wanted to know what happened and why. For video clips depicting one character involuntarily initiating a causal chain, participants had to decide between prioritizing intentionality or control in the assignment of responsibility. This provided data on cross-cultural differences on how these two factors were weighed.

Before the training phase, the task was explained to participants in their native language. Participants were asked to indicate which actor in each video was responsible for the resulting event and reminded that they could distribute responsibility between all three piles, two piles, or just one pile so long as the distribution of tokens at the end of each trial was proportional to the amount of responsibility of each actor. After this explanation, the participant watched the 10 training videos.

Training. The purpose of the training phase was to allow the participants to gradually familiarize themselves with the rationale of the ratings procedure. For this reason, it was designed to initiate training with six scenes in which the assignment of responsibility seemed straightforward (collaborative action; no involvement of either actor; or one actor involved while the other was not), followed by four items similar in structure to the test items, where responsibility assignment is more competitive, at the end. For each of the first three videos, the experimenter would demonstrate by playing the video, and apportioning the tokens in the appropriate way, and then would explain why they did so. Next, the experimenter would invite the participant to use the tokens to rate responsibility in each of the remaining seven scenes. The experimenter would play a clip, establish which circle on the paper represented each actor in the video, replay the video and ask the participant to distribute the tokens. The experimenter would correct any confusion about allocating the tokens and verified that the participant understood the task.

Testing. The test items were presented in one of four pseudo-randomized orders. Participants were randomly and evenly distributed over these four orders.

During the test phase, participants watched the 24 test clips. After each clip, experimenter and participant established which circle would represent each actor in the video and then played the video a second time. The participant was then asked to distribute responsibility for the final outcome of the clip between the actors. Responses

were recorded in a spreadsheet. Experimenters did not question participant understanding of video clips or correct token distribution during this portion of the experiment. After watching the 24 clips, the participant viewed each clip again and provided a verbal description of the action in the video. The sessions were video recorded in their entirety.

Results

Exclusions

One response by a Mayan participant was accidentally omitted from recording. There are no further missing observations.

Predictions

If it is the case that East Asians pay relatively less attention to internal dispositions of the causer and more to situational factors in their causal attributions compared to Westerners, as suggested by the line of research starting with Morris & Peng (1994), both Causer intentionality and Causee intentionality should play a less predictive role in the ratings of the Chinese participants than in those of the Spanish participants. On the other hand, Le Guen et al's (2015) findings suggest that Causer intentionality may play an even greater role in the Yucatecans' responsibility assignments than in those of either of the other two groups.

Analysis

Figure 3 shows the mean Causer responsibility ratings by population, suggesting small but significant differences (Mandarin M = 7.37, SD = 2.09; Spanish M = 5.98, SD = 3.14; Yucatec M = 6.67, SD = 3.24). Figure 4 presents a breakdown by Causer intentionality, suggesting that the Mayan and Spanish participants, but not the Chinese participants, assigned more responsibility to intentional than to unintentional Causers, as predicted.
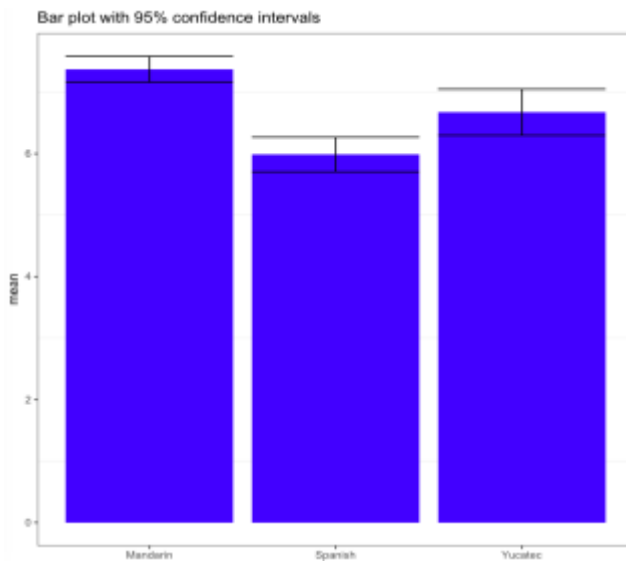

Figure 3: Mean Causer responsibility rating by population

A linear mixed effects regression model was fitted, using the lme4 package in R and treating the Causer responsibility rating as dependent variable. The rating was treated as a continuous rather than ordinal (categorical) variable since the participants expressed it through the proportional allocation of the tokens rather than through labeled categories. As fixed factors were included Population, I→A, I→O, Causee Intentionality, and all binary interactions between Population and the intentionality variables. Random intercepts were added for participant and stimulus clip (formula: CR.Responsibility ~ Population + I→A + I→O + Intentionality.of.CE + Population * I→A + Population * I→O + Population * Intentionality.of.CE + (1 | Participant.ID) + (1 | Clip.Code)). The three intentionality variables were coded binarily.
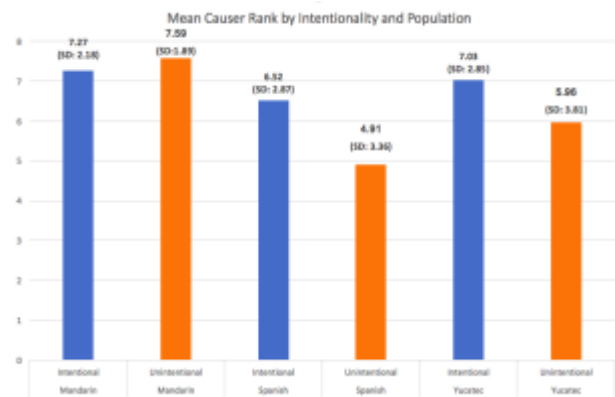

Figure 4: Mean Causer responsibility rating by population and Causer intentionality

Table 2 summarizes the effects. Due to the multitude of models, the confidence level should be Bonferroni-adjusted to p<.001. Effects outside this level should be ignored. There were main effects of population and causee intentionality and significant interactions between population and the I→A link and between population and causee intentionality. There was neither a main effect of the I→O link nor did it feature in any significant interaction. Collinearity of factors above .6 occurred exclusively between the absence of I→A and the absence of I→O (to be expected, as in the design of the items, the former entails the latter, i.e., we did not include scenes in which an unintended action accidentally yielded an intended outcome; cf. Table 1) and between some of the interactions and either their component factors or interactions sharing a factor.

Discussion

The presence of an unintentional (nonvolitional) Causee significantly boosted attribution of responsibility to the causer across populations. This is of course eminently plausible and thus can be seen as very basic support of internal validity.

In line with what Figure 1 suggests, the Spanish and Yucatec participants' ratings were significantly lower than those of the Chinese participants, although the differences

were quite small. This effect is plausibly attributable to the Spanish and Yucatecan participants having paid more attention to the intentionality/volitionality of the Causee than the Chinese participants, in line with the hypothesis that intentionality plays a lesser role in the Chinese participants' attributions.

Table 2. Significant factors in the regression model with coefficients (sig. codes 0 '***' 0.001 '**' 0.01 '*' 0.05)

Factor (CE = Causee)	Baseline population		
	Chinese	Spanish	Yucatec
Chinese	N/A	*** 5.1	
Spanish	*** -1.2	N/A	** -1.1
Yucatec		** 1.2	N/A
No I→O			
No I→A		*** -3.6	* -2.2
CE unintentional	** 1.7	*** 2.8	** 1.6
Chinese * No I→O	N/A		
Spanish * No I→O		N/A	
Yucatec * No I→O			N/A
Chinese * No I→A	N/A	*** 3.1	* 1.8
Spanish * No I→A	*** -3.1	N/A	* -1.4
Yucatec * No I→A	* -1.8	* 1.4	N/A
Chinese * CE unintentional	N/A	** -1.1	
Spanish * CE unintentional	** 1.1	N/A	** 1.2
Yucatec * CE unintentional		** -1.2	N/A

Crucial for the evaluation of our predictions are the interactions between population and the causer intentionality variables. In line with our predictions, we found that absence of the I→A link – i.e., an unintended action on the causer's part – strongly positively interacted with Chinese against Spanish as baseline and vice versa. In other words, the Chinese participants' responsibility scores for unintentional causers were significantly higher than the Spanish participants, in line with predictions. The relevant interactions with Yucatec were not significant by the Bonferroni criterion.

Turning to unintentional causees, this factor showed a significant positive interaction with Spanish against Chinese as baseline. The Spanish participants rated Causer intentionality higher than the Chinese participants when the Causee was unintentional. This suggests that the Spanish participants paid more attention to the intentionality of the causee than the Chinese participants did – again in line with predictions. When Spanish was the baseline, significant negative interactions with both Chinese and Yucatec were found (and when Yucatec was the baseline, of course the inverse positive interaction with Spanish materialized). This suggests that the Spanish participants rated Causer responsibility relatively higher when the Causee was acting involuntarily than did the Yucatec participants. It thus appears that Causee intentionality played a greater role for the Spanish participants than for the Yucatecans.

The difference between the populations was specifically located in scenes that lacked I→A, in other words, scenes in

which an unintended action caused a certain result (which in our stimuli was likewise unintended). In all instances, the relevant actions of the Causer involved spontaneous bodily functions (yawning, sneezing, losing balance, fainting). Such acts caused the Spanish and Yucatec participants, but not the Chinese participants, to rate the Causer's responsibility lower. In contrast, we found no significant effect for scenes in which intended actions had unintended consequences (e.g., causing somebody to leave the room by singing poorly or causing somebody to knock down a cup tower by running into them while dragging a cart backwards into the room).

General discussion

We did not find greater sensitivity to intentionality among our Mayan participants than among the other two groups. There is thus no apparent evidence of remnants of 'magical thinking' in our traditional non-Western population, contrary to the findings of Le Guen et al (2015). However, as predicted by a line of studies in social psychology, the Chinese participants in our experiment appear to have been less inclined to factor the intentionality of both the Causer and the Causee into their attributions of responsibility than the Spanish participants. To our knowledge, this has been demonstrated here for the first time in terms of relative responsibility distribution between competing actors.

Future research

Whether our evidence of culture-specificity in causal attributions submits to the explanatory mechanisms in terms of folk theories of group agency vs. individual agency and/or context sensitivity invoked in research tradition that motivated the present study remains to be seen. A crucial test will be the extension of the investigation to other populations of the supposed 'egocentric' vs. 'sociocentric' types. We are currently preparing to test further populations.

A question we intend to take up in the next phase of our investigation is whether the apparent difference in causal attribution also manifests itself in the grammatical means used when members of the different groups talk about causality. It has often been observed that more agentive causal chains tend to be represented more compactly in language than less agentive ones. Thus, *Sally made Floyd knock over the cup tower* implicates, but does not entail, that Sally acted intentionally, whereas *Sally bumped into Floyd and he knocked over the cup tower* does not (McCawley 1976). This predicts that members of sociocentric societies may use relatively more compact representations of low-intentionality scenarios than members of egocentric societies. If confirmed, this could suggest a relationship between grammars and folk theories of agency.

For the treatment of agency in linguistic theories, two responses to our findings are conceivable: retain a universal notion of agency, which then plays a variable role in the grammars of different languages, or replace it with culture-specific concepts of agency, which then would stand a chance of playing a more uniform role across languages.

Acknowledgments

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