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Children's Use of Similarity and Rituals with Food and Objects to Determine Affiliation

A Thesis submitted in partial satisfaction of the
requirements for the degree Master of Science
in Psychological and Brain Sciences

by

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June 2022

The thesis of Bailey Ann Immel is approved.

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June 2022

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ABSTRACT

Children's Use of Similarity and Rituals with Food and Objects to Determine Affiliation

by

Bailey Ann Immel

As children learn to navigate the social world, they attend to certain cues that signal affiliation between individuals. One cue that children readily use is similarity such that people who do the same things or share the same characteristics are more likely to be affiliated than people who do different things. Additionally, rituals provide significant cultural information that children readily attend to. However, the importance of these two indicators may differ depending on the observed domain such that certain actions (e.g., eating) contain an abundance of social information without the use of rituals. Across two studies, we asked whether children (ages 4-11 years) differentially use similarity and rituals in determining affiliation. When children saw both ritual and non-ritual actions with objects, they rated those who did the same action, regardless of ritual status, as being affiliated more often than when they did different actions. However, this was not the case when children saw the actors interact with foods. Thus, children do consider similarity to different degrees when viewing food and non-food-related behaviors.

Keywords: Ritual, Cultural learning, Social cognition, Children

From an early age, children must learn to communicate with others, determine what is safe to consume, learn who is trustworthy, and navigate complex social relationships. To do this, children must learn patterns of affiliation and group membership. One method by which children determine social affiliation is through similarity (Kandel, 1978). People tend to seek out those who are like themselves and form close attachments to those individuals. Analyses considering friendship networks have demonstrated stronger links between people with similar characteristics (Mollgaard et al., 2016). The use of similarity can extend from an individual's desire to find and develop relationships with people who are similar to them into how people learn about group affiliation among many people. For example, children use similarity of gender to guide their understanding of friendship between two people and believe that people are friends with others who match their gender (Lieberman & Shaw, 2019).

Many types of similarity are linked to children's expectations of friendship. In one study, children preferred puppets who were similar to them because of hair color more than they preferred puppets who simply wore the same shirt color and preferred those who shared their toy preference over those who were arbitrarily given a similar sticker to wear (Fawcett & Markson, 2010). This work has demonstrated that, although children generally believe the old adage that "birds of a feather flock together", they are also keen observers of the types of similarity that may be socially relevant (370 BCE/1952 (Plato, 1973)). Interestingly, this preference for individuals who are similar does not stop at concrete similarities such as shared food preference and gender but extends into domains that are more abstract such as attitudes, beliefs, education, and many other domains (Byrne & Griffitt, 1966; McPherson et al., 2001; Neimeyer & Mitchell, 1988).

Interestingly, not all types of similarity convey the same amount of social information given the social situation in question. For instance, some types of similarity are a way in which people determine interpersonal social relationships between others such as friendship (Afshordi & Liberman, 2021; Powell & Spelke, 2013). However, other types of similarity are less likely to be indicative of friendship. For example, children utilize prosocial similarity (e.g., inviting another person to a sleepover) when considering interpersonal social relationships, however, arbitrary similarity (e.g., having shared skills, wearing the same shirt), shared facts (e.g., having the same birthday; Afshordi, 2019), or instrumental similarity in action (e.g., turning on a light) do not provide children with information about interpersonal relationships. Thus, children prioritize certain types of similarity, namely similarity that is social, as more indicative of interpersonal affiliation than cases where similarity happens by chance.

Yet, there are types of similarity that may not be indicative of interpersonal affiliation but could provide information about another important type of affiliation: group membership. Although similarity is often considered in the context of close, personal relationships, it can also be an indicator of group membership, which does not require people to know each other to be affiliated. For example, seeing two people wearing the same color shirt at school doesn't provide information about how good of friends they are. Yet, it is not always the case that shirt color would be uninformative in determining affiliation. In fact, when the context of the similarity is altered and two children are wearing the same shirt color at a soccer game, it would provide information about their group-level affiliation (Dunham et al., 2011). Thus, certain types of similarity can be an indicator of friendship, but other types of similarity can be an indicator of group-level affiliation regardless of whether

the people in question are familiar with each other. To this end, research should consider both the context of the similarity that is being displayed and distinguish between the different levels of affiliation that children may be attending to.

Here, we focus our attention on what types of affiliation are indicated by similarity in *action*. Specifically, we aim to address the important questions of how children distinguish between which actions are arbitrary and which are relevant for determining either interpersonal or group-level affiliation. Humans engage in a wide variety of actions. Many of these actions, such as picking up a glass to drink water, are instrumental: people perform them in order to accomplish their goal. When two people engage in the same instrumental action, it may not convey much social information since the action is necessary for completing a task. For example, there is no reason to expect that two people who use glasses to drink water are likely to affiliate or to be in the same group.

However, some actions are socially relevant and do convey information about affiliation. For example, two people who know how to play the same musical instrument (particularly if it is obscure) may be more likely to be friends with one another. One type of action that is particularly socially relevant is rituals: performing the same ritual actions often provides information about group affiliation. Rituals differ from instrumental actions in that they are causally opaque (i.e., it is not clear how the actions lead to the outcome), causally irrelevant (i.e., the actions in the ritual are not necessary to achieve the desired outcome) and share important social significance (Legare & Souza, 2012). In fact, rituals are a clear marker by which people establish and maintain group membership (Durkheim & Swain, 2008; Summers-Effler, 2006). Thus, shared ritual actions may be different from other types of similarity in that they signal group-level affiliation rather than interpersonal affiliation.

Ritual actions share common characteristics such as opaque causality and teach children culturally relevant information. In comparison, instrumental actions are causally transparent and allow children to gain knowledge regarding methods for completing a task (Legare et al., 2015). Given the social nature of rituals and their use for enhancing group cohesion, children may use rituals to differentially evaluate others' ritualistic actions compared to instrumental actions and form beliefs about group-level affiliation.

Recent studies have worked to understand the extent to which children are knowledgeable about the social implications of shared rituals. Liberman and colleagues (2018) tested infants' understanding of the importance of shared rituals in determining affiliation in a series of looking-time studies. Infants looked longer, and were therefore more surprised, when individuals who had previously engaged in the same ritual (e.g., using their head to turn on a light) disengaged from each other (i.e., turned their backs to each other and frowned). Interestingly, when the actors engaged in the same actions due to physical constraints (e.g., a person using their head to turn on a light while they were wrapped in a blanket and unable to use their hands compared to someone whose hands are free but chooses to use their head to turn on the light) infants did not infer affiliation. Although turning the light on is an instrumental action, using one's head to do so when their hands were free to complete the action was seen as a ritual. Rituals have been demonstrated across groups in a variety of domains such as methods for achieving a goal (Legare et al., 2015), and making group relevant items (Wen et al., 2020). Ritual actions are present within many areas of our life such as how we celebrate holidays and special occasions, cheer for sports teams, and engage in religious practices. One domain for which rituals play an integral role

is food. Therefore, food may be an area in which rituals play a unique role in signaling affiliation.

Food is of particular interest because food choice is tied to culture; therefore, what people eat is group-relevant (DeJesus et al., 2019). However, the social significance of food reaches far beyond the ingredients in a recipe. Although it is true that certain foods are more readily available in certain communities than others, eating is entwined with another marker of social category membership—rituals. Food rituals are seen across cultures in the way we eat, who we allow to eat with us, and how we prepare our foods. For example, Jewish individuals celebrate Seder by making special dishes, retelling stories during the meal, and eating symbolic foods. These rituals are performed in part to signal and strengthen group membership (Johnson et al., 2011). In addition, partaking in these rituals increases individuals' consumption and enjoyment more than partaking in random gestures without ritual components (Vohs et al., 2013). However, food provides a significant amount of social information even in the absence of rituals.

Food-related actions may contain a significant amount of social information without the introduction of ritual behaviors. Although rituals tend to enhance children's evaluation of affiliation when enacted on non-food-related behaviors, it is unclear whether beliefs about affiliation are affected by ritual actions when enacted on food (Legare et al., 2015). Even though eating and preparing food often includes rituals, aspects of food are socially indicative of group membership without the introduction of ritual actions. For example, many Americans probably have never encountered Daikon and if presented with the vegetable, would not know how to prepare it or whether it was even edible. However, individuals in China and Japan are very familiar with Daikon and eat it frequently. Children

recognize the social nature of food without ritual actions and expect people who are from the same social group to share similar food preferences (Lieberman et al., 2016).

In a series of studies, children were asked to evaluate which people would eat which foods. Children were presented with conventional food pairings (e.g., a hotdog and mustard; milk and chocolate sauce) and unconventional food pairings (e.g., a hotdog and chocolate sauce; milk and mustard). Children were more likely to indicate that people from their cultural ingroup would eat the conventional food pairings than people from their cultural outgroup (DeJesus et al., 2019). Food has distinct social meaning beyond its involvement in rituals and it is therefore unclear how children think about similarity in action when considering food and non-food actions. Thus, it is possible that adding a ritual action in the food domain, doesn't provide more information about group membership than simply sharing a food preference. If this is the case, we would expect children to think that people who prepare the same foods are from the same group to the same degree whether they prepare the food using ritual actions or non-ritual actions. Furthermore, children's use of similarity and rituals to reason about affiliation seems to differ based on the type of affiliation in question. The above example asked children about cultural or group-level affiliation. Children may think about this type of affiliation differently compared to interpersonal affiliation such as being friends with another person. The types of similar actions people engage in may differentially predict how children think that they are related and therefore these types of affiliation should be measured separately.

The present study aims to investigate whether children use rituals to determine affiliation above and beyond similarity, and whether rituals convey information about group-level or interpersonal-level affiliation. Here, we distinguish rituals as a particularly

interesting action type to consider given the potential to signal group-level affiliation more than interpersonal-level affiliation. Across two studies, we test children's propensity to use both similarity and action type (ritual vs. non-ritual) to make judgements about affiliation in the object and food domains. Children saw actors making block towers (Study 1) or mixing foods together (Study 2). As a measure of similarity: the actors created the same end product or different end products. As a measure of ritualistic action, children saw two trials: one trial with ritualistic actions and the other with non-ritualistic actions. Children answered three questions regarding the group-level (e.g., Are they from the same place?) and interpersonal (e.g., Do they know each other? How good of friends are they?) affiliation of the two actors. This distinction between the two types of questions was made because, while it is possible that people from the same place, and therefore the same group, know each other, people can also be from the same group and not know each other (e.g., the average American does not know the majority of other Americans, much less the majority of people from their town). Additionally, people can know each other even when they belong to different groups (e.g., a foreign-exchange student friend). Thus, these questions aim to see what level of group membership is being tapped into when children view different types of actions.

Rituals may be particularly important when considering group-level affiliation and shared culture compared to interpersonal affiliation. For example, children believe that people from the same national ingroup are more likely to share cultural knowledge (e.g., how to celebrate a national holiday) than two friends from different national groups (Lieberman et al., 2020). Thus, we sought to examine whether children's responses on the three test questions varied based on the type of affiliation they were asked about such that

questions asking about group-level affiliation would be more likely to show an effect of ritual than the interpersonal affiliation questions.

We hypothesized that children who saw people perform actions on objects would believe that similarity positively predicts affiliation only when the actions were ritualistic, such that children would report that the two actors were most likely to be affiliated when they did the same ritualistic action. However, given the sociality of food choice, we hypothesized that children who saw people make food choices would believe that similarity predicts affiliation regardless of whether the actions were or were not ritualistic. Additionally, we predicted that this would only be the case for group-level affiliation, but not for interpersonal affiliation. This would replicate previous work by Legare and colleagues (2015) demonstrating children's propensity to think that ritual actions indicate group-level affiliation.

Study 1

Methods

Participants

Participants were 210 children (female=98) ages 4-11 years old ($M = 90.91$ months, $SD = 27.32$). Parents indicated their children's race and ethnicity as White (72.17%), Black or African American (1.42%), Asian (7.08%), bi- or multi-racial (13.21%), Hispanic or Latino (4.72%), or other (1.42%).

Data was collected online via Discoveries Online, an online platform that allows families to participate in studies at their own pace (Rhodes et al., 2020).

Design

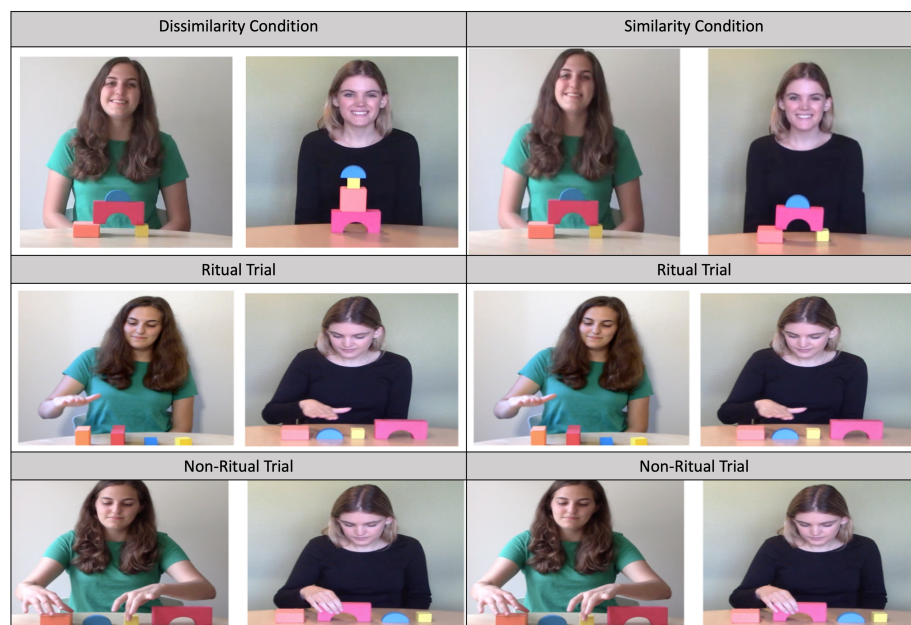
The present study used a 2 (Similarity: Same vs. Different) x 2 (Action Type: Ritual vs Non-Ritual) mixed design, where similarity was between subjects and action type was within subjects.

Procedure

Participants saw videos of two actors with identical sets of blocks. They were informed that the two people were in different rooms and could not see each other. Each video played once and showed the actor putting together a block tower. Subjects were randomly assigned to the same or different condition. The actor started by saying, “I make mine like this”. In the same condition, actors built identical towers. In the different condition, actors built different towers. Participants responded to three questions regarding the actors’ relationship per trial. One trial included rituals (tapping the blocks three times or waving their hand over the blocks three times) before the actor began building while the other trial included no action prior to building (see Fig. 1).

Figure 1

Study 1 design. Children are randomly assigned to either the same or different condition and participate in both a ritual and non-ritual trial with order counterbalanced.



To understand how similarity and rituals influence children's perceptions of group-level affiliation, question one asked children whether the two actors were from the same place. On each trial, after watching the two actors build their towers, children were asked three test questions. First, they were asked whether the two actors were from the same place by clicking either green check indicating yes or a red "X" indicating no.

The next two questions were regarding interpersonal affiliation and asked children whether the actors know each other and whether or not they were friends. First, participants responded to whether the two actors knew each other. Here, we intended to tap into whether children viewed the two actors as having an interpersonal connection above and beyond their shared group membership. Finally, children were asked to rate the friendship of the two actors. The wording of this final question was dependent on their answer to the previous question. Participants who said that the actors knew each other were asked, "How good of friends do you think they are?" However, participants who responded that the two actors did not know each other were asked "How good of friends do you think they would be if they met?" Once again, this question evaluated children's beliefs about the interpersonal relationship of the two actors. Participants rated friendship on a 1–5-point smiley face scale (see Fig. 2). This pattern of questions was repeated for trial 2.

Figure 2

1–5-point smiley face scale used by participants to answer how good of friends the two actors are. Participants were instructed that the farthest left face meant that the two actors were best friends and that the farthest right face meant they were really not friends.



Before beginning the study, children were trained to use both the dichotomous and 5-point scales. Participants were given the opportunity to practice using the scales and were corrected if they initially answered incorrectly.

Results

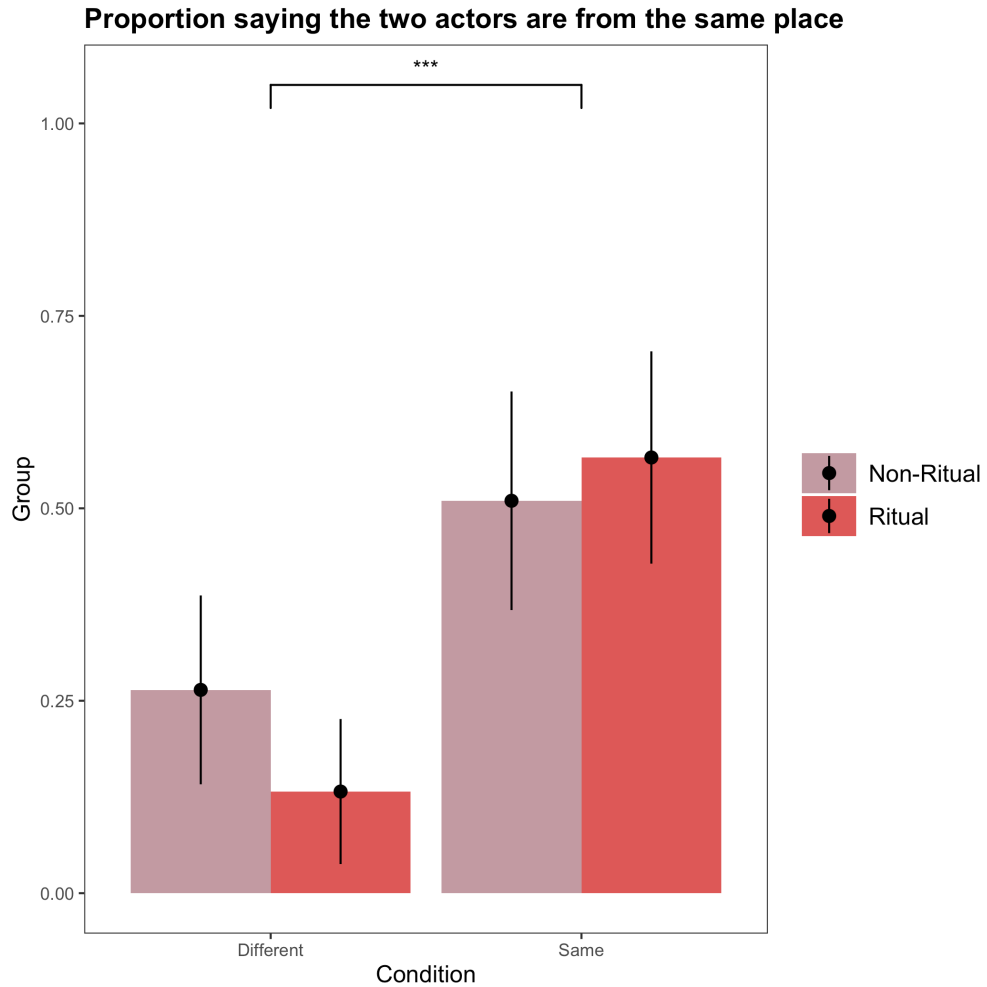
Preliminary binomial and multiple linear regression analyses indicated no effect of age ($ps > .09$) or gender ($ps > .07$) for our primary dependent variables of interest. Additionally, given the within subjects presentation of action type (ritual vs. non-ritual), we investigated whether there was an effect of trial order—whether rituals were presented first or second. When there were significant order effects, we analyzed the first trial only.

Our primary question of interest was whether there was an effect of similarity and whether this effect was stronger when there was a ritualistic action involved. First, we examined children’s beliefs about group membership. Participants’ responses to the question “Are they from the same place?” were coded such that “No” = 0, and “Yes” = 1. Our initial binomial logistic regression model including trial order showed a significant two-way

interaction of trial order and similarity ($Z = -2.477, p = .013$) and a three-way interaction of trial order, similarity, and action type ($Z = 2.050, p = .040$). Therefore, we fit a binomial logistic regression model predicting whether children said that the two actors are from the same place with similarity (same vs different) and action type (ritual vs instrumental action) as well as their interaction using data only from trial 1. To account for repeated measures, we included subject as a random factor. The model revealed a significant main effect of similarity ($Z = 2.539, p = .011, OR = 4.717, 95\% CI [0.097, 0.270]$) such that children were more likely to say that the actors were from the same place when they built the same towers ($M = 0.54, SD = 0.48$) than when they built different towers ($M = 0.20, SD = 0.40$). There was no main effect of action type ($Z = -1.687, p = .093$) or interaction between similarity and action type ($Z = 1.680, p = .093$; Fig. 3).

Figure 3

Proportion of children who answered “yes” when asked whether the two actors were from the same place with error bars indicating standard error. Asterisks indicated a significant difference in the proportion of participants responding “yes” in the different conditions as indicated by the binomial logistic regression.

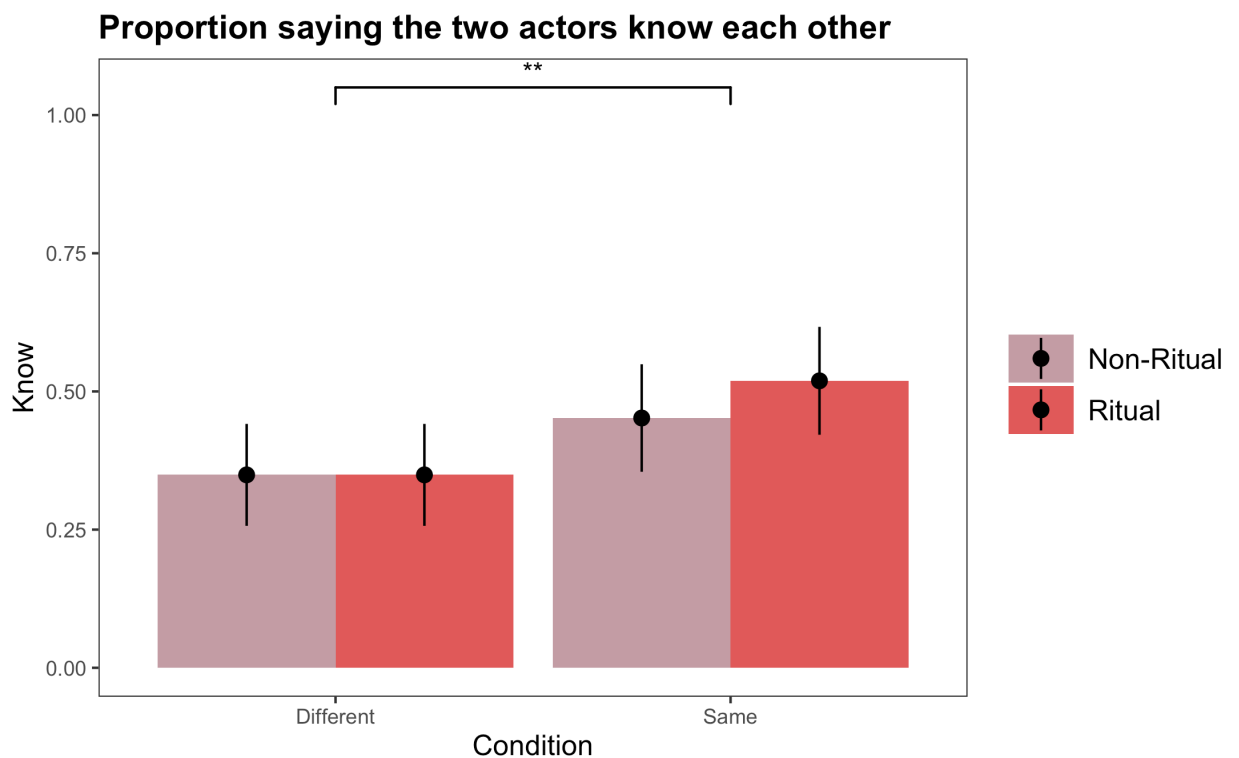


Next, we examined the two variables that were used to measure interpersonal relationships. We asked whether children’s beliefs about whether the two actors know each other were predicted by similarity and action type. Participants’ responses to the question

“Do they know each other?” were coded such that “No” = 0, and “Yes” = 1. Here, our initial model including trial order showed no significant effects of trial order. Thus, we examined data from both trials. We fit a binomial logistic regression model predicting whether children said the two actors know each other with similarity and action type as well as their interaction. Again, subjects were included as a random factor to account for repeated measures. The model revealed a significant main effect of similarity ($Z = -2.369, p = .018, OR = 0.333, 95\% CI [0.130, 0.371]$) such that children were more likely to say that the actors were from the same place when they built the same towers ($M = 0.49, SD = 0.50$) than when they built different towers ($M = 0.35, SD = 0.48$). There was no main effect of action type ($Z = -0.947, p = .344$) or interaction between similarity and action type ($Z = 0.947, p = .344$; Fig. 4).

Figure 4

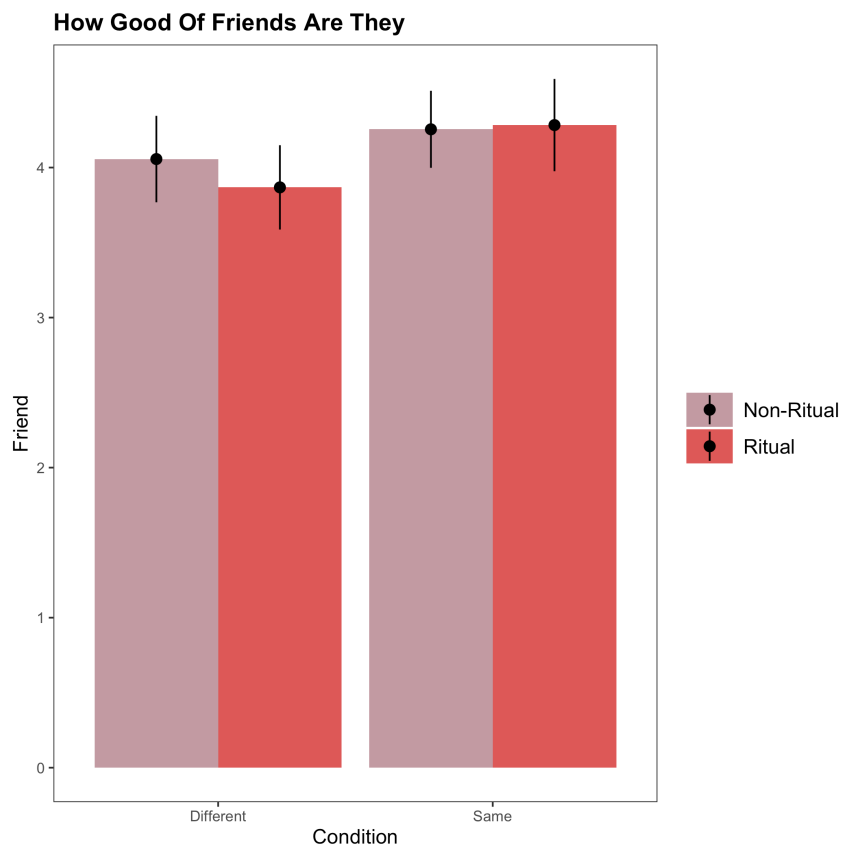
Proportion of children who answered “yes” when asked whether the two actors knew each other with error bars indicating standard error.



Finally, we asked whether children’s ratings of the two actors’ friendship were predicted by similarity and action type. Participants responses to the question “How good of friends do you think they are?” were coded on a 1-5 scale with 1 being “really not friends” to 5 being “best friends.” Our initial model including trial order showed a significant two-way interaction of trial order and action type ($t(206) = -2.567, p = .011$). Therefore, we fit a multiple linear regression model predicting friendship ratings from similarity and action type as well as their interaction using data only from trial 1. Subjects were included as a random factor to account for repeated measures. The model showed no main effect of similarity ($t(206) = 0.984, p = .326$) or action type ($t(206) = -0.946, p = .345$). Additionally, the model showed no significant interaction between similarity and action type ($t(206) = 0.765, p = .445$; Fig. 5).

Figure 5

Average friendship rating given by children when asked how good of friends the two actors were with error bars indicating standard error.



Discussion

Results from Study 1 suggest children's use of similarity to determine affiliation. Indeed, children were more likely to report that the two actors are from the same place when they built the same tower than if they built different towers. Thus, children do view similarity as an indicator of affiliation.

Although this effect of similarity did replicate when children were asked whether the two actors knew each other (but not when asked how good of friends the two actors were), the effect was greater when children were asked about group-level affiliation compared to when they were asked about interpersonal affiliation. More specifically, children were 4.170 times more likely to report that two people were from the same place when they saw them do the same things compared to different things but were only 3.003 times more likely to say that two people knew each other when they did the same thing compared to different things. Thus, there was a more robust effect of similarity on our group-level variable compared to our interpersonal-level variable. It is possible that the underlying differences in the question types are revealing differences in children's assumptions of affiliation. For example, we chose to ask children if the two actors were from the same place as a method for tapping into group-level affiliation. However, asking about knowing the other person and being friends with the other person insinuates a more interpersonal-level affiliation. Perhaps, children view similarity in action as demonstrating group-level affiliation but not interpersonal affiliation. For example, it is possible for similarity in action to indicate being from the same group (e.g., university students know what cheers to do at a football game) and yet the similarity in action is not more likely to indicate that they know each other or be friends.

Contrary to our hypotheses, children did not use action type when determining affiliation at the group or individual level. Additionally, these results run contrary to the extant literature on children's understanding of rituals and affiliation. It is possible that children do not consider rituals to be important to determining affiliation. However, it is more likely that children didn't feel that the rituals in this context were conveying significant social information. Perhaps, tapping and spinning one's hands over blocks does not convey the same information as putting beads on a necklace in a particular way as was demonstrated by Wen and colleagues (2020). Given that it is unclear why children did not attend to rituals in the object domain when considering affiliation, we replicated the methods, including the ritual actions, in Study 2 for the food domain. Maintaining consistency across studies allows us to more directly compare children's use of both similarity and rituals across domains as well as the ability to discern whether these rituals were inadequate for distinguishing affiliation in any domain or if they were particularly ill-suited for the object domain. Thus, Study 2 used the same tapping and spinning movements to indicate ritual actions.

Study 1 replicated previous work demonstrating that children do attend to similarity in the object domain and expect those who engage in similar actions to affiliate. Study 2 expands on this idea of similarity of action and affiliation by examining similarity in the food domain. We reasoned that children are likely to view food and eating behaviors as distinct from those behaviors performed with objects. Specifically, we predicted that children would rely solely on similarity (i.e., children will view those who make the same foods as being more likely to be from the same place and know each other and be better friends than those who make different foods) when considering both group and interpersonal

affiliation in the food domain due to the robust social information conveyed by shared food preferences without the presence of rituals. Therefore, Study 2 sought to replicate the methods of Study 1 using food as the source of information for participants compared to objects.

Study 2

Methods

Participants

Participants were 210 children (female = 105) ages 4-11 years old ($M = 85.95$ months, $SD = 27.26$). Parents indicated their children's race and ethnicity as White (49.05%), Black or African American (3.33%), Asian (15.71%), bi- or multi-racial (28.57%), Hispanic or Latino (1.43%), or other (1.90%).

Data was collected online via Discoveries Online.

Procedure

Participants followed the same procedure from Study 1. However, the actors in the videos made food that they each tried. Instead of building towers with blocks, the actors added an ingredient to the food. In each video, a female actor sat at a table with one bowl in front of them and a cup on either side of the bowl. The actor started by saying, "I make mine like this." Participants were randomly assigned to either the similarity condition or the dissimilarity condition. In the similarity condition, both actors used the same color of cup to add an ingredient to their food. In the dissimilarity condition, the actors used different cups to add an ingredient to their bowl. The actor picked up a spoon and took a bite from the bowl before saying, "mmmm." Participants were asked the same three questions after each trial as from Study 1.

All participants saw two trials including a ritual action (e.g., spinning their spoon over the cups or using their spoon to tap the cups) and instrumental action (e.g., looking into each cup before pouring the ingredients into the bowl). In the same action condition, participants saw the actors do the same ritual, and in the different condition, they saw different rituals.

Results

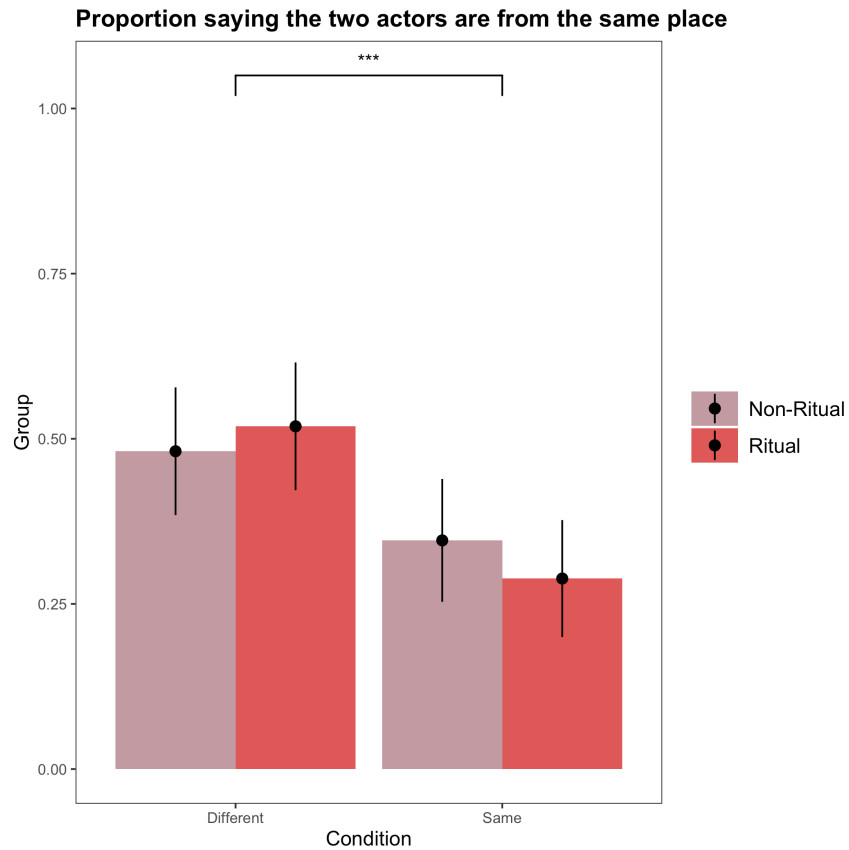
Preliminary binomial logistic regression and multiple linear regression analyses indicated no effect of age ($ps > .06$) for our primary dependent variables of interest. A model including gender as a factor did reveal a main effect of gender for one of our dependent variables of interest (“How good of friends do you think they are?”) such that boys rated the two actors lower on the friendship scale ($M = 3.02$, $SD = 3.91$) compared to girls ($M = 3.12$, $SD = 3.98$). Additionally, given the within subjects presentation of rituals, we investigated whether there was an effect of trial order—whether rituals were presented first or second. When there were significant order effects, we analyzed the first trial only.

Our primary question of interest was whether there was an effect of similarity and whether this effect was stronger when there was a ritualistic action involved. First, we examined children’s beliefs about group membership. Participants’ responses to the question “Are they from the same place?” were coded such that “No” =0, and “Yes” =1. Here, our initial binomial logistic regression model including trial order showed no significant effects of trial order. Thus, we examined data from both trials. We fit a binomial logistic regression model predicting whether children say that the two actors are from the same place with similarity (same vs different) and action type (ritual vs instrumental action) as well as their interaction. To account for repeated measures, we included subject as a random factor. The

model revealed a significant main effect of similarity ($Z = 3.330, p < .001$) such that children were more likely to say that the actors were from the same place when they made different foods ($M = 0.49, SD = 0.50$) than when they made the same foods ($M = 0.35, SD = 0.47$). There was no main effect of action type ($Z = 0.297, p = .766$) or interaction between similarity and action type ($Z = -1.173, p = .241$; Fig. 6).

Figure 6

Proportion of children who answered “yes” when asked whether the two actors were from the same place with error bars indicating standard error.

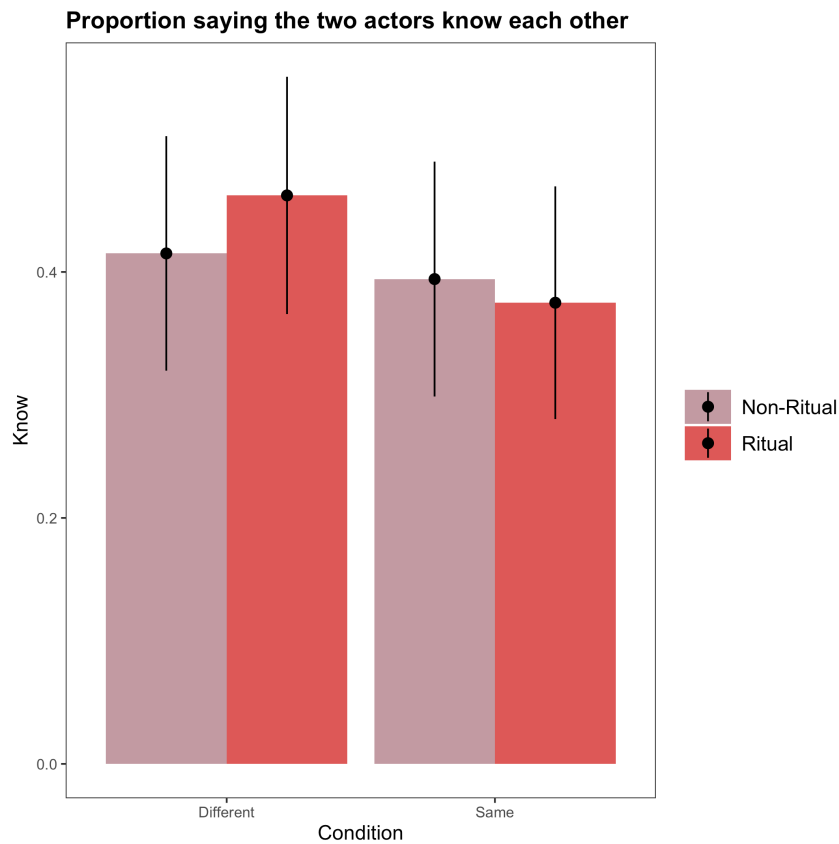


Next, we examined the two variables that were used to measure interpersonal relationships. We asked whether children’s beliefs about whether the two actors knew each other was predicted by similarity and action type. Participants’ responses to the question

“Do they know each other?” were coded such that “No” = 0, and “Yes” = 1. We fit a binomial logistic regression model predicting whether children said the two actors know each other with similarity and action type as well as their interaction. Here, our initial model including trial order showed no significant effects of trial order. Thus, we examined data from both trials. Again, subjects were included as a random factor to account for repeated measures. The model showed no main effect of similarity ($Z = 0.938, p = .348$) or action type ($Z = -0.398, p = .690$) Additionally, the model showed no significant interaction between similarity and action type ($Z = -0.930, p = .352$; Fig. 7).

Figure 7

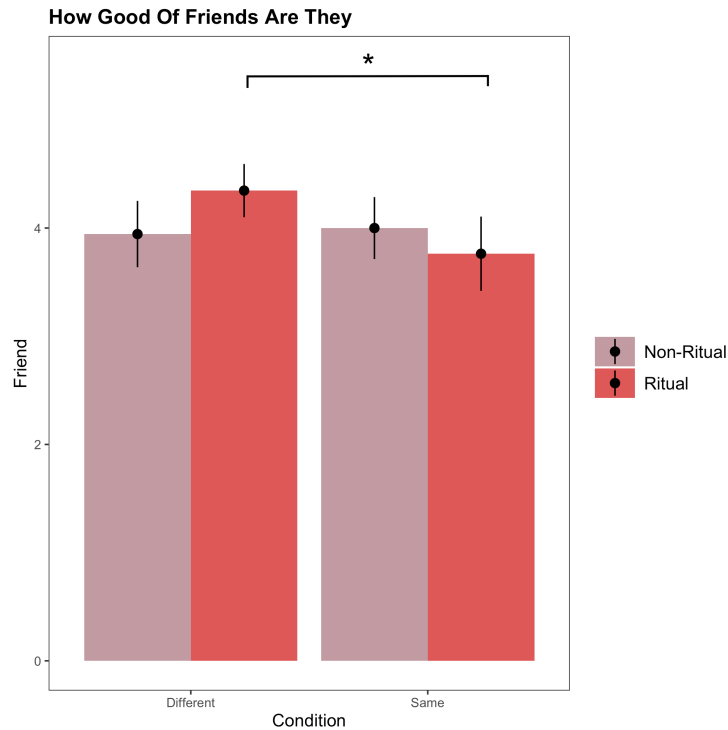
Proportion of children who answered “yes” when asked whether the two actors know each other with error bars indicating standard error.



Finally, we asked whether children's ratings of the two actors' friendship were predicted by similarity and action type. We fit a multiple linear regression model predicting friendship ratings from similarity and action type as well as their interaction. Here, our initial model including trial order showed a significant interaction effect of trial order and action type ($t(412) = -2.038, p = .042$). Thus, we examined data from only trial 1. Again, subjects were included as a random factor to account for repeated measures. The model showed no main effect of similarity ($t(416) = 0.251, p = .802$) or action type ($t(416) = 0.1887, p = .061$). However, the model did reveal a significant interaction between similarity and action type ($t(416) = -2.103, p = .037$). Paired contrasts revealed a significant difference in friendship ratings by children for those who saw the actors do different rituals compared to the same ritual ($t(206) = -2.103, p = .037$) such that when children viewed the two actors doing different actions, they rated those who did different ritual actions as better friends ($M = 4.35, SD = 0.88$) than those who did the same ritual actions ($M = 3.76, SD = 1.32$; Fig. 8).

Figure 8

Average friendship rating given by children when asked how good of friends the two actors were with error bars indicating standard error.



Discussion

Although we predicted that children would rely on similarity of actions more than rituals in the food domain due to the already inherent social nature of food and eating behaviors, Study 2 suggested that children use similarity to reason about interpersonal affiliation (i.e., friendship). However, children's use of similarity ran contradictory to our expected pattern of results, such that children reported thinking that actors who did different rituals were more likely to be from the same place than people who did different non-ritual actions or people who did the same actions. It is possible that children do not use shared ritual actions or similarity as a method for determining affiliation in at the group or

interpersonal level and that in fact, they do believe that people who engage in these types of similar actions are even less likely to be affiliated. However, it is more likely the case that children did not view the presented situations and actions as meaningful demonstrations of similarity and shared rituals.

The rituals presented to children lacked external validity as they were significantly different to the types of food and eating rituals seen every day by children. It is possible then, that children did not use rituals to reason about affiliation because the rituals were not meaningful to them. Future studies will include rituals that more closely match rituals seen in everyday eating practices. Additionally, the similarity of the actions may too have lacked distinct meaning to children. Children were unable to see what the actors poured into their bowls and what each container held. Given that children are familiar with using different types of cups and bowls and understand that the contents of two containers can be the same regardless of the color of the container, children may not have understood that the different colored cups were meant to represent different ingredients being added to a food. Future studies will address this issue by incorporating clearer demonstrations of similarity.

General Discussion

Across two studies we demonstrate that there are differences in how children view affiliation when observing similar and dissimilar actions. Specifically, children view those who do similar actions with non-food-related objects as being more likely to affiliate (i.e., be from the same place and know each other) than those who do dissimilar actions with non-food objects. However, this is not the case when children view people engaging in actions with food. Contrary to hypotheses, children reported that people who engaged in different actions were more likely to be from the same place than people who did similar actions.

However, these results did not replicate with our other two variables (i.e., Are they from the same place and how good of friends are they?) because children did not use similarity to reason about interpersonal affiliation in the food domain and when asked how good of friends the two actors were in the object domain, this pattern directly contradicts previous literature on similarity. Nonetheless, this pattern of results may be understood by considering some methodological choices made in the study.

One particularly interesting outcome is the differences in participants' responses to the three dependent variables. In Study 1, only our group-level dependent variable was significantly predicted by similarity. Yet only one of the interpersonal level dependent variables were significantly predicted by similarity or action type. Thus, it is possible that in the case of objects, similarity indicates group-level affiliation but not interpersonal affiliation. However, in Study 2, we saw a slightly different pattern whereby the model revealed a significant interaction between similarity and action type for one of the interpersonal variables ("How good of friends do you think they are?"). Nonetheless, this interaction is in the opposite direction of our hypotheses, such that children report that people who do different ritualistic actions are better friends than people who do the same ritualistic or non-ritualistic actions. Here, it is possible that the same criticisms addressed above are affecting the pattern of results. Future work may examine how different actions (e.g., ritual vs non-ritual) in different domains may signal affiliation that is more interpersonal (i.e., friendship) or group-level (i.e., cultural).

Another consideration is the difference in memorability of the similarity and dissimilarity in Studies 1 and 2. In Study 1, similarity and dissimilarity remained visible throughout the test questions (i.e., the block towers were present in front of the actors' still

images while participants answered the test questions). However, in Study 2, the cups and bowl in front of the actors are the same regardless of similarity or dissimilarity. It is possible then, that children had difficulty tracking similarity and therefore struggled to use this as a cue for determining the actors' affiliation. Future studies will incorporate transparent bowls as well as distinct color differences so that the similar and dissimilar foods will be easier for children to track.

An important consideration is how rituals were operationalized and presented in the current studies. Here, we used actions for rituals that were causally opaque (i.e., it was unclear how the action related to the outcome) and causally irrelevant (i.e., the actions were not necessary for completing the apparent task). The rituals used here included the actors tapping or spinning their hand or spoon around the objects in front of them before building their tower or making their food. Although these actions do meet definition for ritualistic actions, the rituals may not be salient enough for children to focus their attention on. Additionally, the rituals used in the study do not necessarily map on to any culturally relevant rituals practiced with either food or objects. Thus, the lack of differences between ritual and non-ritual trials may be in part due to the lack of realism in our ritual actions. Future studies will consider how to present rituals that map on more carefully to those observed in everyday practices.

Another potential contributor to our pattern of results is the similarities between our ritual and non-ritual trials. The present studies presented children with both cases in counterbalanced order. However, given how closely matched the two trials were, there might have been carry-over effects across trials. Indeed, when adding trial order to our models, we did find cases where this was the case and trial order significantly predicted

children's responses to our dependent variables. Therefore, future studies will run a fully between-subjects design such that participants will see only one pair of actors that either do the same or different ritual or non-ritual actions to better account for these effects.

Understanding who is affiliated and who has socially relevant information is a vital yet complicated undertaking for young children. However, they do have cues such as similarity in action and ritual actions to help guide their thinking. The present work suggests that children may rely more on similarity to determine group-level affiliation when considering actions in the non-food domain than in the food domain. Additionally, the present studies suggest that rituals may not provide meaningful social information for children in all cases. Although rituals have been demonstrated to be a method for children to determine group-level and interpersonal affiliation in past research (Legare et al., 2015), the present studies suggest that there are cases where children do not use rituals to the same degree. Overall, our current findings suggest that there may be differences in how children consider these types of actions across the food and non-food domain. However, there is still more to understand about the degree to which this occurs.

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