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What Do Group Members Share? The Privileged Status of Cultural Knowledge for Children

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Abstract

An essential aspect of forming representations of social groups is to recognize socially relevant attributes licensed by the group membership. Because knowledge of cultural practices tends to be transmitted through social contact within social groups, it is one of the fundamental attributes shared among members of a social group. Two experiments explored whether 5- and 6-year-olds selectively attribute shared cultural knowledge on the basis of group membership of agents. Using novel social groups, children were introduced to one target agent and two other agents, one of which belonged to the same group as the target and one belonged to a different group. Children were then asked who would *know* or *like* same things as the target agent. The results showed that children expect group members to know the same songs, whereas they do not necessarily expect them to like the same songs or know the same generic facts. These findings suggest that children are remarkably selective in the attributions they make based on social group membership and from early on, they expect social group membership and cultural knowledge to be closely linked.

Keywords: Social groups; Shared knowledge; Shared preference; Generic facts; Culture; Songs; Music

1. Introduction

Throughout history, humans have lived in groups of mutually interacting and cooperating individuals who collectively competed with other groups. Because we are profoundly dependent on other members of our group, it may be an adaptive cognitive capacity for humans to represent social groups. Sensitivity to social groups emerges early in life. Young children and even infants expect members of a social group to engage positively with one another (e.g., to help each other, share resources with each other) (Jin & Baillergeon, 2017;

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Misch, Over, & Carpenter, 2014; Rhodes & Chalik, 2013) and to share physical, behavioral and psychological attributes (e.g., Diesendruck & haLevi, 2006; Dunham, Baron, & Carey, 2011; Plötner, Over, Carpenter, & Tomasello, 2016; Powell & Spelke, 2013; Shutts, Pemberton-Roben, & Spelke, 2013). Even though group members can share various attributes, however, different attributes are constrained by group membership in varying degrees. Cultural knowledge stands out as a fundamental attribute that is shared among group members. As a cultural species, humans are endowed with mechanisms that allow them to create and transmit knowledge of certain practices that are unique to a particular group of individuals (Herrmann, Call Hernàndez-Lloreda, Hare, & Tomasello, 2007; Whiten & van Schaik, 2007). Importantly, this knowledge is mainly transferred socially within cultural groups. An understanding that social group membership delineates cultural knowledge enables individuals to keep track of what knowledge is shared with others and plays an essential role in communication. As novice group members who are in the process of acquiring cultural knowledge and adapting to the social environment, children would particularly benefit from this understanding. The present research explores the nature of humans' sensitivity to the relationship between group membership and shared knowledge by examining its developmental foundations in children. Does cultural knowledge have a privileged status as an attribute shared among group members, or are other abstract attributes that indicate similarity among individuals, but are not as strictly constrained by social group membership, similarly generalized across members of the same group?

Research from such diverse disciplines as sociology, anthropology, and ethnomusicology shows that human social groups create their unique cultural niche in order to establish boundaries and facilitate affiliation among their members (Bourdieu, 1984; Durkheim, 1915; Rappaport, 1968; Stokes, 1994; Turner, 1969). As a result, we have a range of socially acquired practices, norms, preferences, beliefs, and knowledge that differ significantly across communities (Pagel & Mace, 2004). A growing body of evidence points to an early emerging awareness of the conventionality of culture (for a review, see Diesendruck & Markson, 2011). For instance, starting in infancy, group members are expected to act in similar ways (Powell & Spelke, 2013), or have similar preferences (Birnbaum, Deeb, Segal, Ben-Eliyahu, & Diesendruck, 2010; Diesendruck & haLevi, 2006; Liberman, Woodward, Sullivan, & Kinzler, 2016; Plötner et al., 2016). Infants expect individuals who display the same ritualistic actions or who exhibit similar preferences to be affiliated (Liberman, Kinzler, & Woodward, 2014, 2018). Infants and young children are more likely to adopt behaviors and preferences, if they are endorsed by members of their linguistic ingroup (Buttelmann, Zmyj, Daum, & Carpenter, 2013; Kinzler, Corriveau, & Harris, 2011; Kinzler, Dupoux, & Spelke, 2007; Shutts, Kinzler, McKee, & Spelke, 2009; Soley & Sebastián-Gallés, 2015). Starting around the age of 2 years, children associate conventional actions with native speakers (Liberman, Howard, Vasquez, & Woodward, 2018; Oláh, Elekes, Bródy, & Király, 2014), they expect normative behaviors to apply to members of the same group (Kalish, 2012; Weatherhead, White, & Friedman, 2016), and they enforce norms selectively to ingroup members (Schmidt, Rakoczy, & Tomasello, 2012). Previous research also suggests that 3-to 6-year-old children consider social norms (e.g., the rules of a game) to be specific to social groups,

but moral norms (e.g., not to steal from someone) to be applicable to everyone (Liberman, Howard et al., 2018). While the aforementioned studies focused mainly on conventional behaviors and actions, some studies also demonstrated that children infer a *cultural common ground* (Clark, 1996) between themselves and other members of their community regarding different culturally familiar cues such as labels or objects (Diesendruck, 2005; Goldvicht-Bacon & Diesendruck, 2016; Liebal, Carpenter, & Tomasello, 2013).

Among different psychological attributes that are related to one's culture such as preferences, beliefs, and attitudes, knowledge might be more strictly constrained by group membership, because it is acquired primarily through social interactions (Legare & Harris, 2016). Other attributes, such as preferences, on the other hand, may be related to various factors, including biological or evolutionary ones (e.g., Little, Apicella, & Marlowe, 2007; Masataka, 2006), or individual characteristics (e.g., Rentfrow & Gosling, 2003). Consequently, same group members can have different preferences and different group members can have preferences in common. In line with this, starting in infancy, cultural conventions and preferences seem to be distinguished in terms of how they are attributed to others. For instance, even though infants generalize conventions such as object labels across individuals, they do not do so for preferences (Henderson & Woodward, 2012). Compared to preferences, normative behaviors are generalized more strongly based on group membership by 4- and 5-year-olds (Kalish, 2012; Kalish & Lawson, 2008; Weatherhead et al., 2016). Further, 5- and 6-year-old children and adults generalize knowledge of songs across same-language speakers rather than same-gender individuals; however, they do not systematically generalize preferences for songs across either category (Soley & Aldan, in press). Notably, shared knowledge trumps shared preference in guiding social choices of children as well as adults (Soley & Spelke, 2016; Vélez, Bridges, & Gweon, 2019). For instance, when presented with two potential friends that differ in their knowledge of or preference for songs, 4- and 5-year-olds prioritize shared knowledge over shared preference and choose to be friends with those who know the same songs as they do, regardless of targets' preferences for those songs (Soley & Spelke, 2016). Thus, even though preference and knowledge tend to co-occur in our daily experiences, starting early in life, both children and adults seem to distinguish these attributes when using them to guide their social preferences and inferences. Together these findings raise the possibility that cultural knowledge might have a privileged status as an attribute shared among group members, starting early in development.

1.1. The present research

The present research asks whether young children make selective inferences about individuals' knowledge of cultural practices based on their group membership. Contrasting inferences of shared song preference, shared song knowledge, and shared knowledge of generic facts based on novel social groups, this research aims to extend previous research exploring the early understanding of conventionality of culture and the representations of social groups in a number of important ways.

Studies on children's understanding of the conventional nature of culture mainly focused on their inferences regarding the conventionality of behaviors and actions, and knowledge of other cultural artifacts such as music or games, or folk tales, is largely unexplored (but see Soley & Aldan, in press). In the current studies, music is used as a form of cultural knowledge for two main reasons. First, music is an important element in virtually every culture (Brown, 1991), with culture-specific variations (Cross, 2001; Nettl, 1983). Second, by using music, different abstract attributes such as shared knowledge and shared preference can be closely matched to probe the selectivity of children's group-based inferences.

Previous research points to the importance of shared knowledge in guiding children's and adults' social inferences and preferences (Soley & Aldan, in press; Soley & Spelke, 2016; Vélez et al., 2019), raising important questions in relation to the nature of the relationship between shared knowledge and social groups. Soley and Aldan (in press) showed, for instance, that children generalize song knowledge based on the language individuals speak rather than their gender. The present research aims to extend this work by investigating children's inferences about shared psychological attributes based on novel social groups rather than familiar social cues such as language and gender. By using novel groups, it aims to provide insight into the nature of children's abstract representations of social groups and ensures that children's inferences are based on these representations rather than their pre-existing views of specific social categories.

Finally, just like different psychological attributes, different kinds of knowledge are likely to be constrained by group membership in varying degrees. As an example, whether someone knows that cats have four legs might be specified by that person's environment. Nevertheless, unlike arbitrary forms of cultural practices, knowledge of such generic facts tends to be objective and self-evident, and it is more likely to cross-cut the boundaries of social groups (Diesendruck & Markson, 2011; Kalish & Sabbagh, 2007; Koenig & Harris, 2005). Children show some awareness of these distinctions. For instance, children aged between 5 and 11 years distinguish between direct knowledge that can be acquired through first-hand experience and indirect knowledge that requires learning from others, and expect someone who lives in isolation to have access to only direct knowledge (Lockhart, Goddu, Smith & Keil, 2016). Similarly, 4-to 7-year-old children expect novel generic facts (e.g., "hedgehogs eat hexapods") to be known by their mothers, whereas they do not hold a similar expectation for novel non-generic facts ("some hedgehogs ate hexapods last night") (Cimpian & Scott, 2012). Given these distinctions, would children's group-based generalizations of different types of knowledge also differ, or would they expect group members to know similar things in general? The present research begins addressing these questions by exploring whether song knowledge and knowledge of generic facts are attributed similarly based on group membership.

Two experiments investigated whether 5- and 6-year-old children infer from observing that two individuals are members of the same social group that they share certain attributes such as knowledge and preference. Previous research using a similar paradigm showed that same-age children distinguish between others' knowledge and preference states when making social inferences (Soley & Aldan, in press). Experiment 1 examined

whether children similarly attribute shared knowledge of songs and shared preference for songs on the basis of a novel social group membership. To further probe children's selectivity, Experiment 2 asked whether different knowledge types are generalized similarly based on group membership and examined children's inferences of shared knowledge of generic facts on the basis of social group membership. Children were introduced to two novel social groups composed of non-human cartoonlike agents: Tikas and Mitus. Previous research using similar groups found that such groups elicit differences in children's attributions of characteristics to individuals based on their group membership (e.g., Baron & Dunham, 2015; Baron, Dunham, Banaji, & Carey, 2014). Children were shown one target character and two other characters, one of which belonged to the same group as the target and one which belonged to a different group. Children were then asked who would *know* or *like* same things as the target character.

2. Experiment 1

Experiment 1 asked whether children infer that members of the same and different social groups share song knowledge and song preference to a similar extent. Children were presented with songs that were known or liked by a target character and they were asked who else would know or like those songs. Children were randomly assigned to knowledge and preference conditions.

2.1. Method

2.1.1. Participants

Fifty-one children (25 females, M_{age}: 6 years, range: 5–6 years 11 months) participated in Experiment 1. Three additional children were tested, but they were eliminated from the sample due to being too distracted during testing ($n = 1$) or giving ambiguous answers on one or more trials ($n = 2$). Children were recruited from public and private schools located in Istanbul, Turkey. No specific information about parental ethnicity, education, or socioeconomic status was collected. All children were tested individually in their schools. Ethics approval was obtained from the university ethics review board.

2.1.2. Procedure

2.1.2.1. Familiarization phase: The experimental session started with a familiarization phase, where the experimenter introduced two novel groups (Tikas and Mitus) on a computer screen. The experimenter showed four characters from each group wearing same-color shirts (yellow or green) and said: "These are Tikas" and "These are Mitus." Next, children were shown these two groups side by side on the computer screen and the experimenter asked them to identify each group by saying: "Can you show me which ones are Tikas/Mitus?". If a child could not point to the right groups on the first trial, the experimenter repeated the questions one more time. Forty-four children passed this phase on

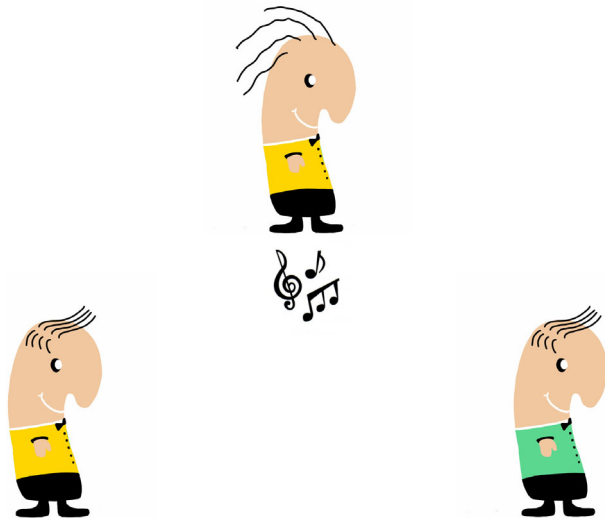

Fig. 1. Example display from Experiment 1.

the first trial, and the remaining seven children could correctly identify the groups on the second trial.

2.1.2.2. Test phase: After the familiarization phase, children received four test trials. On each of four trials, a target character appeared at the top of the screen and the experimenter said, "I played a song to this Mitu/Tika. Let us listen to the song" and played a tune. In the knowledge condition, experimenter then said, "This Mitu/Tika *knows* this song." Following this, two other characters appeared on the screen, one from the same group as the target character and one from the other group. Children were then asked, "Who else would *know* this song? This Mitu/Tika (pointing to one of the characters), this Tika/Mitu (pointing to the other character) or both?" (see Fig. 1). In the preference condition, the procedure was identical, except that after playing the tune, the experimenter said, "This Mitu/Tika *likes* this song" and children were asked who else would like the song. Children received four trials with different tunes. The tunes were synthesized versions of 18th-century Western folk melodies presented without lyrics, previously used by Soley and Spelke (2016).

The target character's group membership and the side of the matching character (left or right) were counterbalanced across four trials. The order of the target's group membership (i.e., being a Mitu or a Tika) and the shirt color of the groups was counterbalanced across children.

2.2. Results and discussion

In order to examine whether children's same group choices differed depending on the inference type, children's trial-by trial choices were coded as "1" for same group choices

and "0" for other choices and these scores were compared across the two conditions (knowledge vs. preference) using Generalized Estimating Equations command in SPSS. A repeated measures binary logistic regression with outcome as choosing the same group member or not across four trials, being predicted by the inference type (fixed: song knowledge vs. song preference) and subject (random: to control for repeated measures) revealed that the inference type significantly predicted whether children chose same group characters or not (Wald $\chi^2 = 5.64$, df = 1, $p = .018$, $\phi = .16$).

Each child was given a score between 0 and 4 by summing up their same group choices across four trials. The average of these scores was compared against chance separately for knowledge and preference conditions. Chance level for choosing the same group character was 0.33 for each trial, given that children could choose "Same," "Both," or "Different" on each trial. The results showed that the average of children's same group choices ($M = 2.12$, $SD = 1.36$) was higher than expected by chance in the song knowledge condition ($t(25) = 2.97$, $p = .007$, $d = .58$) (chance level = 1.33), whereas it did not differ from chance level in the song preference condition ($M = 1.16$, $SD = 1.41$, $t(24) = -.57$, $p = .574$) (see Fig. 2a,b).

The results of Experiment 1, thus, show that children expect group members to know the same songs. However, they do not expect group members to like the same songs. These findings are in line with previous work showing that children expect same-

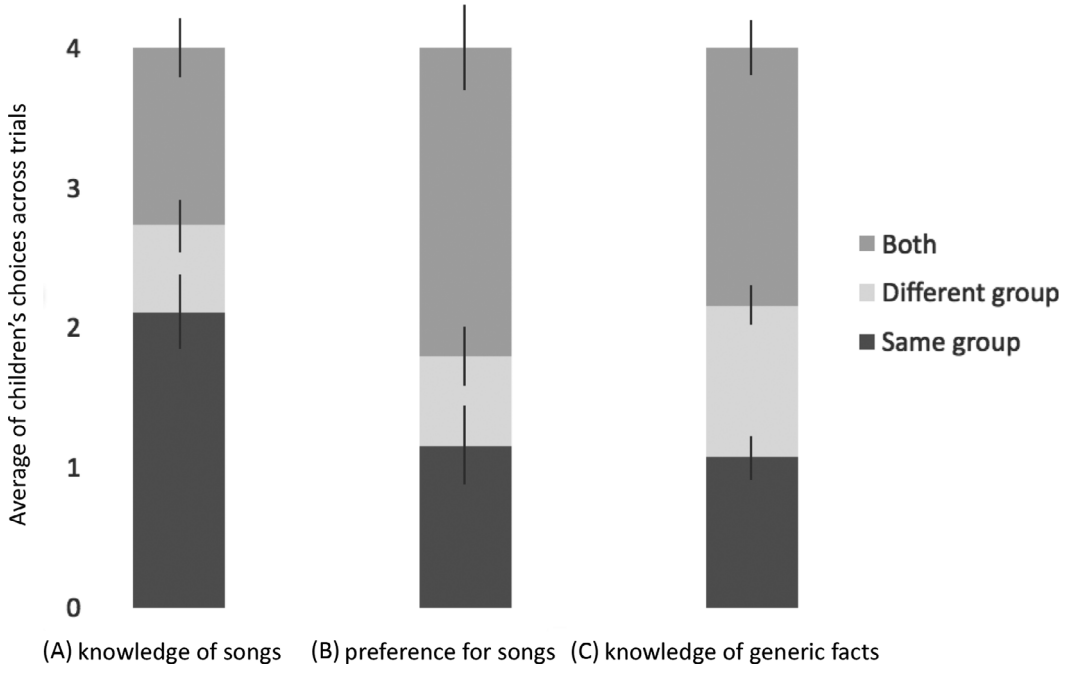

Fig. 2. Average of children's choices of "same group," "different group," and "both": (a) in the song knowledge condition (Experiment 1), (b) in the song preference condition (Experiment 1), and (c) in the generic facts condition (Experiment 2). Error bars show standard error.

language speakers to know, but not necessarily like the same songs (Soley & Aldan, in press). Unlike previous work, however, children in this study had no prior knowledge of the social groups the target agents belonged to. Therefore, the current findings provide further insight into the nature of children's abstract representations of social groups and suggest that children are flexible in terms of the psychological attributions they make about novel individuals based on their group membership and they selectively generalize knowledge of songs across individuals who are from the same social group.

A critical question arising from these results concerns children's expectations regarding the conventionality of different kinds of knowledge. Children's group-based inferences might be specific to knowledge of cultural practices. Alternatively, children might infer that individuals belonging to the same group are likely to know the same things in general. Previous research suggests that children distinguish between different kinds of knowledge in terms of their conventionality and, for instance, expect generic facts to be more widely known, compared to non-generic facts (Cimpian & Scott, 2012). Generic facts provide a useful contrast for probing the specificity of children's group-based generalizations of cultural knowledge. As discussed earlier, even though members of a group might be more likely to acquire knowledge of same generic facts, such knowledge is not necessarily restricted to members of the same social group, and it is likely to be available to members of different groups.

In order to address this question, a second experiment was conducted. Using the same paradigm as in Experiment 1, this experiment examined whether children generalize knowledge of generic facts based on agents' group membership. Experiment 2 also investigated the role of children's own knowledge state in guiding their generalizations of knowledge to others. The songs used in Experiment 1 were 18th-century American folk songs, highly unlikely to be familiar to the participating children. In Experiment 2, children's knowledge of the generic facts was also assessed to examine whether they generalize knowledge differently depending on whether it is familiar or not.

3. Experiment 2

3.1. Method

3.1.1. Participants

Forty-three children (22 females, M_{age}: 6 years, range: 5–7 years [one child turned 7 on the day of testing]) participated in Experiment 2. Compared to the song knowledge ($N = 26$) and the song preference conditions ($N = 25$), in Experiment 2, the sample size per condition was increased in an attempt to have a meaningful number of trials with facts that were familiar and unfamiliar to participating children. Two additional children were eliminated from the sample due to experimenter error ($n = 1$), or giving ambiguous answers on one or more trials ($n = 1$). Children were recruited from the same population as in Experiment 1. Thirty-eight children passed the familiarization phase on the first trial, and the remaining five children could correctly identify the groups on the second

trial. Two children were tested in the laboratory, and all remaining children were tested in their schools.

3.1.2. Procedure

The procedure was identical to Experiment 1, except that on each of the four test trials, the experimenter stated that the target character knew a novel fact: "*This Mitu/Tika knows that rabbits sleep 16 hours a day*." Children were then asked, "*Who else would know that rabbits sleep 16 hours a day*? This Mitu/Tika (pointing to one of the characters), this Tika/Mitu (pointing to the other character) or both?".

As in Experiment 1, a novel fact was introduced on each trial. These facts were that dogs get hiccups, that some fish do not have eyelids, that cats can see better than humans in the dark, and that rabbits sleep 16 hours a day. At the end of the session, children were introduced to each of these facts once more and were asked whether they themselves knew these facts or not. Children's answers were recorded as "yes" or "no."

3.2. Results and discussion

The average of children's same group choices (M = 1.07, SD = 1.05) was at chance level in the generic knowledge condition ($t(42) = -1.55$, $p = .128$).

In order to examine whether children's familiarity with the facts predicted their same group choices, a repeated measures binary logistic regression with outcome as choosing the same group member or not, being predicted by the familiarity of the generic facts based on children's reports (random: "yes" or "no") was conducted. The results revealed a marginal effect of familiarity: Children tended to choose the character that belonged to the same group as the target more frequently, when the facts were unfamiliar to them (Wald $\chi^2 = 3.42$, df = 1, $p = .065$, $\phi = .14$). The percentages of children who reported to be familiar with the facts, and who generalized them to the character belonging to the same group as the target, are reported separately for each of the four facts in Table 1.

In order to compare children's same group choices across conditions, the data from Experiment 2 are collapsed together with the data from Experiment 1. A repeated measures binary logistic regression with outcome as choosing the same group member or not, being predicted by the inference type (fixed: song knowledge, song preference, and generic knowledge) and subject (random: to control for repeated measures), revealed that the inference type significantly predicted children's same group choices (Wald $\chi^2 = 12.07$, df = 2, $p = .002$, $\phi = .18$). Separate binary logistic regressions showed that children's same group choices differed based on the knowledge type (song knowledge vs. generic

Table 1
Percentage of familiarity of each of the generic facts and their generalization to same group characters

	Dogs	Fish	Cats	Rabbits
Familiar	44.2	55.8	81.4	53.5
Same group attribution	27.9	30.2	20.9	27.9

knowledge) (Wald $\chi^2 = 11.39$, df = 1, $p = .001$, $\phi = .20$), but not by whether children generalized song preference or generic knowledge (Wald $\chi^2 = .082$, df = 1, $p = .774$).

Finally, given the marginal effect of familiarity of the generic facts on children's generalizations, children's same group choices in the song knowledge condition were compared to the same group choices in the generic knowledge condition, including only the trials with unfamiliar facts in the analysis. The results showed that same group choices in the song knowledge condition were higher compared to their same group choices in the generic knowledge condition, even when only those trials with unfamiliar facts were included in the analysis (Wald $\chi^2 = 4.04$, df = 1, $p = .045$, $\phi = .15$).

Overall, the results of Experiment 2 show that children do not expect same group members to know same generic facts more than different group members. Further, children are more likely to infer that knowledge of generic facts are constrained by group membership, if they are not familiar with the facts themselves. Nonetheless, compared to the knowledge of novel generic facts, knowledge of novel songs is still generalized more strongly based on group membership.

4. General discussion

The present research examined children's generalizations of attributes that are constrained by social group membership in varying degrees, including knowledge of songs, preference for songs, and knowledge of generic facts, based on agents' group membership. Children were introduced to novel social groups in an attempt to prevent them from relying on their existing knowledge and beliefs about familiar social categories, when making inferences about the shared attributes of the target agents. Children expected same group members to know the same songs; however, they did not expect them to like the same songs or know the same generic facts. These results suggest that children's generalizations of song knowledge are not driven by the inferences that same group members tend to share similar attributes or know similar things. Instead, group membership and cultural knowledge seem to have a privileged link even for young children.

Children's generalizations of song preference and knowledge of generic facts suggest that group membership does not inform them about these two attributes as strongly. Children might infer that these two attributes are more widely shared than song knowledge (e.g., Cimpian & Scott, 2012), or alternatively they might infer that these attributes are constrained by some factors (e.g., personality characteristics). Because in the present study, children were not asked about their reasoning regarding their choices, the results do not allow distinguishing different possibilities regarding why these attributes are not generalized selectively based on group membership, and different mechanisms might be underlying children's choices when attributing knowledge of generic facts and preferences for songs.

Children's generalizations of preference for songs similarly within and between groups might reflect the more complex nature of preferences compared to knowledge. After all, preferences for music can result from various factors, including personality characteristics

and the structure of our ear (Masataka, 2006; Rentfrow & Gosling, 2003), and they tend to change with age (LeBlanc, Sims, Siivola, & Obert, 1996). Further, depending on the kind of preference (e.g., preference for music vs. preference for toys), and the kind of group (e.g., gender-based groups vs. minimal groups), children's generalizations might differ. For instance, children use group membership marked by gender to guide their own preferences as well as their inferences about others' preferences for toys or activities (Shutts, Kinzler, Banaji, & Spelke, 2010). On the other hand, music preferences that are linked to people's personalities in adulthood (Rentfrow & Gosling, 2003, 2006) might be considered individual specific also by children. In this study, the two social groups were distinguished by their labels and by the color of their clothing, yet children were not asked what kinds of categories these groupings were mapped onto. Thus, it is possible that for different social groups, such as groups based on age or gender, preferences might be generalized based on group membership more strongly (e.g., Bauer & Coyne, 1997; Diesendruck & haLevi, 2006; Hirschfeld & Gelman, 1997; Leinbach, Hort, & Fagot, 1997; Martin & Little, 1990).

The results of the present research show that children not only distinguish between song knowledge and song preference, but also between different kinds of knowledge and expect group membership to more strongly constrain knowledge of songs compared to knowledge of generic facts. This finding raises interesting questions for future research, regarding the role of knowledge acquisition mechanisms and children's and adults' interpretations of different kinds of knowledge in guiding their social inferences. Even though some generic facts tend to be self-evident, young children acquire most knowledge, including generic facts and songs, mainly through direct social interactions (Gelman, 2009). Nevertheless, they selectively attribute knowledge of songs on the basis of group membership. This might suggest that children's social inferences are not entirely shaped by how they themselves acquire knowledge. Indeed, children, at this age, show parallel reasoning to adults in terms of what information can be self-acquired (Lockhart et al., 2016). Consequently, while they might learn that cats can see better than humans in the dark through their teachers or parents, children might reason that because such information is observable, it is available to everyone. Further, even though adults have spent many years using means such as books and the Internet for acquiring knowledge, previous research suggests notable parallels in adults' and children's social inferences based on shared knowledge (Soley & Aldan, in press; Soley & Spelke, 2016; Vélez et al., 2019). Thus, despite the differences in how knowledge is mainly acquired in adulthood and in childhood, because throughout most of human history, knowledge of cultural practices has been transferred from one generation to the next through direct social contact, individuals might have a tendency to attend to this cue when making social choices and inferences across the lifespan. On the other hand, children showed a greater tendency to generalize generic facts based on group membership, when they themselves were unfamiliar with those facts. This tendency implies that for unfamiliar generic facts, children, to some extent, entertain the possibility that such knowledge might only exist within group boundaries. Future studies, by exploring the role of children's intuitions regarding

different kinds of generic knowledge, can provide greater insight into the mechanisms guiding their social inferences.

An interesting future direction would be to explore group-based generalizations of generic information that is not group-specific, but unlike the facts used in this study, needs to be acquired through testimony of others, such as knowledge of certain scientific facts (Harris & Koenig, 2006). Children, like adults, consider such indirect information (e.g., that the earth is round) as less likely to be self-acquired, compared to directly observable information (e.g., that the sky is blue) (Lockhart et al., 2016). Accordingly, they might assume that such knowledge is delimited by group membership to a greater degree than self-evident generic knowledge.

Another important question concerns group-based inferences about different types of non-generic cultural knowledge. While music, and in particular songs, constitutes an important element of culture, human groups are distinguished also by their knowledge of particular traditions, tales, games, or dances. In all of these domains, knowledge tends to be socially transferred among group members, creating a tight link with group membership. Nevertheless, these domains might vary in terms of how they are practiced or emphasized in a given culture, leading to potential differences in their social meaning. Investigating how different types of non-generic cultural knowledge are linked with social groups across different cultural contexts and over the course of development will help us gain a better understanding of the psychological foundations of cultural diversity.

Together with the previous results demonstrating the importance of shared cultural knowledge in guiding their social preferences (Soley & Spelke, 2016), these findings raise the possibility that cultural knowledge might also serve as a diagnostic cue to group membership. Given that these two kinds of inferences (inferring attributes of individuals based on their category membership vs. inferring category membership of individuals from their attributes) do not always rely on similar mechanisms or show the same developmental trajectory (e.g., Fernbach, Darlow, & Sloman, 2011; Gelman, Collman, & Maccoby, 1986), it will be important to investigate whether young children as well as adults would also make inferences about individuals' group membership selectively based on their knowledge of cultural practices.

Young children are equipped with mechanisms that allow them to make remarkably selective attributions based on social group membership. Understanding when these complex reasoning abilities emerge is important to define the mechanisms that allow humans to identify and flexibly think about the socially relevant attributes of group members. Such investigations might provide new insights into the developmental and evolutionary foundations of the multifaceted and versatile social structure of human societies.

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References

Baron, A. S., & Dunham, Y. (2015). Representing "us" and "them": Building blocks of intergroup cognition. *Journal of Cognition and Development*, *16*(5), 780–801. https://doi.org/10.1080/15248372.2014.1000459

Baron, A. S., Dunham, Y., Banaji, M., & Carey, S. (2014). Constraints on the acquisition of social category concepts. *Journal of Cognition and Development*, *15*(2), 238–268. https://doi.org/10.1080/15248372.2012.742902

Bauer, P. J., & Coyne, M. J. (1997). When the name says it all: Preschoolers' recognition and use of the gendered nature of common proper names. *Social Development*, *6*, 271–291. https://doi.org/10.1111/j.1467-9507.1997.tb00106.x

Birnbaum, D., Deeb, I., Segal, G., Ben-Eliyahu, A., & Diesendruck, G. (2010). The development of social essentialism: The case of Israeli children's inferences about Jews and Arabs. *Child Development*, *81*, 757–777. https://doi.org/10.1111/j.1467-8624.2010.01432.x

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*. Cambridge, MA: Harvard University Press.

Brown, D. (1991). *Human universals*. New York: McGraw-Hill.

Buttelmann, D., Zmyj, N., Daum, M., & Carpenter, M. (2013). Selective imitation of in-group over out-group members in 14-month-old infants. *Child Development*, *84*, 422–428. https://doi.org/10.1111/j.1467-8624.2012.01860.x

Cimpian, A., & Scott, R. M. (2012). Children expect generic knowledge to be widely shared. *Cognition*, *123*(3), 419–433. https://doi.org/10.1016/j.cognition.2012.02.003

Clark, H. H. (1996). *Using language*. Cambridge: Cambridge University Press.

Cross, I. (2001). Music, cognition, culture and evolution. *Annals of the New York Academy of Sciences*, *930*, 28–42. https://doi.org/10.1111/j.1749-6632.2001.tb05723.x

Diesendruck, G. (2005). The principles of conventionality and contrast in word learning: An empirical examination. *Developmental Psychology*, *41*(3), 451–463. https://doi.org/10.1037/0012-1649.41.3.451

Diesendruck, G., & haLevi, H. (2006). The role of language, appearance, and culture in children's social category-based induction. *Child Development*, *77*, 539–553. https://doi.org/10.1111/j.1467-8624.2006.00889.x

Diesendruck, G., & Markson, L. (2011). Children's assumption of the conventionality of culture. *Child Development Perspectives*, *5*, 189–195. https://doi.org/10.1111/j.1750-8606.2010.00156.x

Dunham, Y., Baron, A. S., & Carey, S. (2011). Consequences of "minimal" group affiliations in children. *Child Development*, *82*(3), 793–811. https://doi.org/10.1111/j.1467-8624.2011.01577.x

Durkheim, E. (1915). *The elementary forms of religious life*. London: Allen & Unwin.

Fernbach, P. M., Darlow, A., & Sloman, S. A. (2011). Asymmetries in causal and diagnostic reasoning. *Journal of Experimental Psychology: General*, *140*(2), 168–185. https://doi.org/10.1037/a0022100

Gelman, S. A. (2009). Learning from others: Children's construction of concepts. *Annual Review of Psychology*, *60*, 115–140. https://doi.org/10.1146/annurev.psych.59.103006.093659

Gelman, S. A., Collman, P., & Maccoby, E. E. (1986). Inferring properties from categories versus inferring categories from properties: The case of gender. *Child Development*, *57*(2), 396–404.

Goldvicht-Bacon, E., & Diesendruck, G. (2016). Children's capacity to use cultural focal points in coordination problems. *Cognition*, *149*, 95–103. https://doi.org/10.1016/j.cognition.2015

Harris, P. L., & Koenig, M. A. (2006). Trust in testimony: How children learn about science and religion. *Child Development*, *77*, 505–524. https://doi.org/10.1111/j.1467-8624.2006.00886.x

Henderson, A. M. E., & Woodward, A. (2012). Nine-month old infants generalize object labels, but not object preferences across individuals. *Developmental Science*, *15*(5), 641–652. https://doi.org/10.1111/j.1467-7687.2012.01157.x

Herrmann, E., Call, J., Hernàndez-Lloreda, M. V., Hare, B., & Tomasello, M. (2007). Humans have evolved specialized skills of social cognition: The cultural intelligence hypothesis. *Science*, *317*, 1360–1366. https://doi.org/10.1126/science.1146282

Hirschfeld, L. A., & Gelman, S. (1997). What young children think about the relationship between language variation and social difference. *Cognitive Development*, *12*, 213–238. https://doi.org/10.1016/S0885-2014(97)90014-9

Jin, K., & Baillargeon, R. (2017). Infants possess an abstract expectation of ingroup support. *Proceedings of the National Academy of Sciences*, *114*, 8199–8204. https://doi.org/10.1073/pnas.1706286114

Kalish, C. W. (2012). Generalizing norms and preferences within social categories and individuals. *Developmental Psychology*, *48*, 1133–1143. https://doi.org/10.1037/a0026344

Kalish, C. W., & Lawson, C. A. (2008). Development of social category representations: Early appreciation of roles and deontic relations. *Child Development*, *79*, 577–593. https://doi.org/10.1111/j.1467-8624.2008.01144.x

Kalish, C. W., & Sabbagh, M. A. (2007). Conventionality and cognitive development: Learning to think the right way. *New Directions for Child and Adolescent Development*, *115*, 1–10. https://doi.org/10.1002/cd.178

Kinzler, K. D., Corriveau, K. H., & Harris, P. L. (2011). Children's selective trust in native-accented speakers. *Developmental Science*, *14*, 106–111. https://doi.org/10.1111/j.1467-7687.2010.00965.x

Kinzler, K. D., Dupoux, E., & Spelke, E. S. (2007). The native language of social cognition. *Proceedings of the National Academy of Sciences*, *104*, 12577–12580. https://doi.org/10.1073!pnas.0705345104

Koenig, M. A., & Harris, P. L. (2005). The role of social cognition in early trust. *Trends in Cognitive Sciences*, *9*, 457–459. https://doi.org/10.1111/j.1467-8624.2005.00849.x

LeBlanc, A., Sims, W. L., Siivola, C., & Obert, M. (1996). Music style preferences of different age listeners. *Journal of Research in Music Education*, *44*(1), 49–59. Available at http://www.jstor.org/stable/3345413.

Legare, C. H., & Harris, P. L. (2016). The ontogeny of cultural learning. *Child Development*, *87*(3), 633–642. https://doi.org/10.1111/cdev.12542

Leinbach, M. D., Hort, B. E., & Fagot, B. I. (1997). Bears are for boys: Metaphorical associations in young children's gender stereotypes. *Cognitive Development*, *12*, 107–130. https://doi.org/10.1016/S0885-2014(97)90032-0

Liberman, Z., Howard, L. H., Vasquez, N. M., & Woodward, A. L. (2018). Children's expectations about conventional and moral behaviors of ingroup and outgroup members. *Journal of Experimental Child Psychology*, *165*, 7–18. https://doi.org/10.1016/j.jecp.2017.03.003

Liberman, Z., Kinzler, K. D., & Woodward, A. L. (2014). Friends or foes: Infants use shared evaluations to infer others' social relationships. *Journal of Experimental Psychology: General*, *143*, 966–971. https://doi.org/10.1037/a0034481

Liberman, Z., Kinzler, K. D., & Woodward, A. L. (2018). The early social significance of shared ritual actions. *Cognition*, *171*, 42–51. https://doi.org/10.1016/j.cognition.2017.10.018

Liberman, Z., Woodward, A. L., Sullivan, K. R., & Kinzler, K. D. (2016). Early emerging system for reasoning about the social nature of food. *Proceedings of the National Academy of Sciences*, *113*, 9480–9485. https://doi.org/10.1073/pnas.1605456113

Liebal, K., Carpenter, M., & Tomasello, M. (2013). Young children's understanding of cultural common ground. *British Journal of Developmental Psychology*, *31*, 88–96. https://doi.org/10.1111/j.2044-835X.2012.02080.x

Little, A., Apicella, C. L., & Marlowe, F. W. (2007). Preferences for symmetry in human faces in two cultures: Data from the UK and the Hadza, an isolated group of hunter-gatherers. *Proceedings of the Royal Society B: Biological Sciences*, *274*(1629), 3113–3117. https://doi.org/10.1098/rspb.2007.0895

Lockhart, K. L., Goddu, M. K., Smith, E. D., & Keil, F. C. (2016). What could you really learn on your own?: Understanding the epistemic limitations of knowledge acquisition. *Child Development*, *87*(2), 477–493. https://doi.org/10.1111/cdev.12469

Martin, C. L., & Little, J. K. (1990). The relation of gender understanding to children's sex-typed preferences and gender stereotypes. *Child Development*, *61*, 1427–1439. https://doi.org/10.1111/j.1467-8624.1990.tb02872.x

Masataka, N. (2006). Preference for consonance over dissonance by hearing newborns of deaf parents and of hearing parents. *Developmental Science*, *9*, 46–50. https://doi.org/10.1111/j.1467-7687.2005.00462.x

Misch, A., Over, H., & Carpenter, M. (2014). Stick with your group: Young children's attitudes about group loyalty. *Journal of Experimental Child Psychology*, *126*, 19–36. https://doi.org/10.1016/j.jecp.2015.09.016

Nettl, B. (1983). *The study of ethnomusicology: Twenty-nine issues and concepts*. Urbana: University of Illinois Press.

Oláh, K., Elekes, F., Bródy, G., & Király, I. (2014). Social category formation is induced by cues of sharing knowledge in young children. *PLoS ONE*, *9*(7), e101680. https://doi.org/10.1371/journal.pone.0101680

Pagel, M., & Mace, R. (2004). The cultural wealth of nations. *Nature*, *428*, 275–278. https://doi.org/10.1038/428275a

Plötner, M., Over, H., Carpenter, M., & Tomasello, M. (2016). What is a group? Young children's perceptions of different types of groups and group entitativity. *PLoS ONE*, *11*(3), e0152001. https://doi.org/10.1371/journal.pone.0152001

Powell, L. J., & Spelke, E. S. (2013). Preverbal infants expect members of social groups to act alike. *Proceedings of the National Academy of Sciences*, *110*, E3965–E3972. https://doi.org/10.1073/pnas.1304326110

Rappaport, R. A. (1968). *Pigs for the ancestors*. New Haven, CT: Yale University Press.

Rentfrow, P. J., & Gosling, S. D. (2006). Message in a ballad: the role of music preferences in interpersonal perception. *Psychological Science*, *17*(3), 236–242. https://doi.org/10.1111/j.1467-9280.2006.01691.x

Rentfrow, P. J., & Gosling, S. D. (2003). Do re mi's of everyday life: The structure and personality correlates of music preferences. *Journal of Personality and Social Psychology*, *84*(6), 1236–1256. https://doi.org/10.1037/0022-3514.84.6.1236

Rhodes, M., & Chalik, L. (2013). Social categories as markers of intrinsic interpersonal obligations. *Psychological Science*, *6*, 999–1006. https://doi.org/10.1177/0956797612466267

Schmidt, M. F., Rakoczy, H., & Tomasello, M. (2012). Young children enforce social norms selectively depending on the violator's group affiliation. *Cognition*, *124*(3), 325–333. https://doi.org/10.1111/cdev.12510

Shutts, K., Kinzler, K. D., Banaji, M. R., & Spelke, E. S. (2010). Social categories guide young children's preferences for novel objects. *Developmental Science*, *13*(4), 599–610. https://doi.org/10.1111/j.1467-7687.2009.00913.x

Shutts, K., Kinzler, K. D., McKee, C., & Spelke, E. S. (2009). Social information guides infants' selection of foods. *Journal of Cognition and Development*, *10*, 1–17. https://doi.org/10.1080/15248370902966636

Shutts, K., Pemberton-Roben, C. K., & Spelke, E. S. (2013). Children's use of social categories in thinking about people and social relationships. *Journal of Cognition and Development*, *14*(1), 35–62. https://doi.org/10.1080/15248372.2011.638686

Soley, G., & Aldan, P. (in press).Children and adults selectively infer shared cultural knowledge among same-language speakers. *Child Development*. https://doi.org/10.1111/cdev.13161

Soley, G., & Sebastián-Gallés, N. (2015). Infants prefer tunes previously introduced by speakers of their native language. *Child Development*, *86*(6), 1685–1692. https://doi.org/10.1111/cdev.12408

Soley, G., & Spelke, E. S. (2016). Shared cultural knowledge: Effects of music on young children's social preferences. *Cognition*, *148*, 106–116. https://doi.org/10.1016/j.cognition.2015.09.017

Stokes, M. (1994). *Ethnicity, identity, and music*. Oxford, UK: Berg.

Turner, V. (1969). *The ritual process: Structure and anti-structure*. Piscatawa, NJ: Transaction Publishers.

Vélez, N., Bridgers, S., & Gweon, H. (2019). The rare preference effect: Statistical information influences social affiliation judgments. *Cognition*, *192*, 103994. https://doi.org/10.1016/j.cognition.2019.06.006

Weatherhead, D., White, K. S., & Friedman, O. (2016). Where are you from? Preschoolers infer background from accent. *Journal of Experimental Child Psychology*, *143*, 171–178. https://doi.org/10.1016/j.jecp.2015.10.011

Whiten, A., & van Schaik, C. P. (2007). The evolution of animal "cultures" and social intelligence. *Philosophical Transaction of the Royal Society B: Biological Sciences*, *362*, 603–620. https://doi.org/10.1098/rstb.2006.1998