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Children's expectations of selective informing: The role of informational relevance on group membership based informing

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ABSTRACT

Surprisingly little is known about how informational relevance guides children's informing decisions. Although prior studies have demonstrated that children selectively inform and teach others these studies do not directly address whether children consider informational relevance specific to an outgroup member. We also know that children by age 5 and 6 show robust preferences for their ingroup members in various decisions but does information relevance modulate their ingroup preferences? In three experiments ($N = 180$), we investigated whether Iraqi Kurdish 6-year-old children expect others to inform an ingroup member or an outgroup member, depending on the informational relevance. In Experiment 1 children expected others to inform an ingroup member rather than an outgroup member irrespective of information type – extending prior work on ingroup preferences. In experiments 2 and 3, in which the relevance of the information to an outgroup member was highlighted, children's expectation about informing an ingroup member was modulated by information type. Together, the findings suggest that children consider informational relevance to guide their expectations about others' selective informing in the context of group membership, which could further explain how cultural knowledge is maintained and reinforced among members of the same cultural group.

Sharing information is a crucial aspect of human interaction (Strauss et al., 2002; Tomasello, 2009) as it helps others gain knowledge and strengthens social relationships (e.g., Feinberg et al., 2012; Mesmer-Magnus & DeChurch, 2009; Over & Carpenter, 2012). It is ubiquitous in our everyday lives and emerges early in development (Kline, 2015; Tomasello, 2009). As will be discussed below, children are not indiscriminate in their choice of social partners, preferring to interact with ingroup members over outgroup members in various social situations. Furthermore, children are selective about whom and what they choose to inform and teach. In the present research, we investigated whether children's expectations regarding information-sharing behavior varied depending on the recipients' group membership and whether they considered the relevance of the information being shared.

Theoretically, culture is maintained via socially guided learning (Gergely & Csibra, 2006; Tomasello, 2009), and children, starting early in development, are savvy social learners. To maintain culture, it is also equally important to be good teachers and information transmitters. As reviewed below, children also demonstrate this capacity. However, the literature on children's teaching and informing seems to have largely overlooked a prevalent human tendency of group thinking, particularly ingroup bias and preferences. According to social identity theory (Tajfel & Turner, 1986), we are predisposed to categorize people into ingroup and outgroup, resulting in

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ingroup favoritism and outgroup discrimination. Individuals are motivated to maintain a positive social identity derived from group membership by enhancing ingroup status. This theory, supported by children's ingroup preferences as reviewed below, predicts that information, albeit redundant, might be overly shared within group members. Examining children's informing and teaching in intergroup contexts sheds light on how cultural knowledge might be strengthened over time. In the present research, we asked whether children's ingroup preferences guide their expectations of others' information sharing and whether they might be reduced when the informational relevance specific to an outgroup member is highlighted.

Previous research has demonstrated that young children exhibit ingroup preferences when making decisions such as choosing playmates and objects (e.g., Martin et al., 1999; Shutts et al., 2010; Souza et al., 2013). For example, Martin et al. (1999) found that 3- to 6-year-old children tended to choose playmates of the same age and gender. Additionally, children display prosocial behaviors (such as sharing and helping) based on group membership (e.g., Birch & Billman, 1986; Fehr et al., 2008; Katz et al., 1976; Moore, 2009; see Over, 2018 for a review) and engage in social learning from ingroup members (e.g., Elashi, & Mills, 2014; Howard et al., 2015; Kinzler et al., 2011; Li & Koenig, 2022; McDonald & Ma, 2016). Furthermore, group membership influences children's behavior in enforcing social norms, such that they are more likely to correct an ingroup member's violation of conventional norms (e.g., a rule violation in a board game) than an outgroup member's violation (Schmidt et al., 2012) and this further guides their expectations about others' norm violations (Liberman et al., 2018).

Children's group membership-based reasoning and preferences also extend to their informing and teaching behaviors. While children often teach others within close social relationships such as sibling relationships (e.g., Howe et al., 2016), they understand that not all information should be shared with everyone even among friends (e.g., Kim et al., 2014; Liberman et al., 2020). Children also display group-based reasoning and behaviors when keeping secrets (e.g., Misch et al., 2016). Because informing is an important means of reinforcing and consolidating cultural knowledge shared among group members (see Richerson et al., 2016), and shared knowledge is typically more meaningful to ingroup members than outgroup members, group membership is likely to be an important factor in informing decisions. In fact, a recent study found that 5- and 6-year-old children are inclined to inform an ignorant ingroup member about conventional norms rather than an ignorant outgroup member (Karadağ & Soley, 2023; see also Schmidt et al., 2012 for 3-year--olds). Thus, understanding the role of group membership in informing can shed light on how children learn and transmit cultural knowledge.

More generally, prior studies suggest that children are selective in their information sharing and teaching behaviors. Firstly, children adjust their conversation or teaching according to others' understanding or knowledge levels (e.g., Ashley & Tomasello, 1998; Köymen et al., 2016; O'Neill, 1996; Shatz & Gelman, 1973; Shwe & Markman, 1997; but see Kim et al., 2016 for preschool-aged children's informing a knowledgeable person), which is related to their developing theory of mind (e.g., Strauss et al., 2002; Ziv & Frye, 2004). Even infants as young as 12 months old choose to inform (by pointing) an ignorant person rather than a knowledgeable one (Liszkowski et al., 2008). Recent studies also show that children provide non-redundant information considering others' prior knowledge and competence (Gweon & Schulz, 2019; Rhodes et al., 2015). Moreover, children share information with others based on various other factors including informational veracity (Pueschel et al., 2023), the recipient's job (Danovitch, 2020), task complexity (e.g., Bazhydai et al., 2020) and the benefit of the information to recipients in comparison to the cost of independent information gathering (Bridgers et al., 2020; see also Ronfard et al., 2016). Finally, children selectively transmit information that is potentially widely shared within their cultural group: information that is generalizable (Baer & Friedman, 2018), information that is likely to be accurate (Danovitch et al., 2023) or information acquired in a pedagogical context (Vredenburgh et al., 2015; but see also Bazhydai et al., 2020; see Ronfard & Harris, 2018 for a review).

During conversations speakers are expected to adhere to the principle of relevance which means that they should provide information that is pertinent to the topic being discussed and their conversational partner. Listeners also expect others to provide relevant information (Grice, 1975; Sperber & Wilson, 1995). This same principle of relevance also guides children's social learning (Henderson et al., 2013). Even infants display a similar expectation and are attuned to the informational relevance conveyed through communication and behavior, and thus they learn from others accordingly (e.g., Southgate et al., 2009). From this perspective, another person's knowledge states and other factors (as previously reviewed) might be one of the many factors that speakers consider to determine the relevance of information for a potential recipient in a given context. To further illustrate this point, cultural knowledge and skills may be more relevant to ingroup members who possess that knowledge compared to outgroup members who lack that same knowledge. However, we know little about whether children's informing based on group membership is flexibly adjusted according to the informational relevance. In particular, children's consideration of informational relevance *specific to an outgroup member* was not examined in prior studies.

The present research investigated children's selective informing decisions in a third-party context where the children themselves did not have social ties with the presented child characters. This was done to ensure that children's responses were not merely influenced by their own social motives (e.g., affiliation, reputation). Note that prior studies exclusively examined children's own informing decisions. Therefore, the new assessment provides insights into how children's ingroup preferences may extend to their expectations about others' epistemic states (e.g., ingroup members are likely to possess knowledge because others would have informed them) and related normative judgments about others' informing (e.g., they should inform an ingroup member rather than an outgroup member) and epistemic states (e.g., they should know this). Specifically, we asked whether children expect others to inform an ingroup or an outgroup member based on informational relevance. To this end, we established group membership status in terms of whether or not the presented characters attended the same school (see Fehr et al., 2008 for a similar manipulation of group membership) and used different types of information. In Experiment 1, we used information that belonged to conventional knowledge (i.e., an ingroup member's school norms) and information that belonged to episodic knowledge (i.e., a box's contents). We expected that information relevance in terms of group membership would be more likely to be considered for conventional knowledge than episodic

knowledge. That is, we hypothesized that children would display group-based informing more frequently with respect to conventional than episodic knowledge as studies show that children understand conventional knowledge is highly group relevant (e.g., Diesendruck & Markson, 2011; Göckeritz et al., 2014; Karadağ & Soley, 2023; Liberman et al., 2018; Schmidt et al., 2012). Unlike prior studies, we compared the conventional domain to the episodic rather than the moral domain. The fact that children understand certain knowledge is applicable and shared across different groups, as in the moral domain, does not necessarily indicate that they would not show ingroup preferences in that domain. In fact, ingroup preference was still present in their teaching decisions within the moral domain, as children chose an ingroup member more frequently than an outgroup member (Karadağ & Soley, 2023), and it guides children's expectations of others' positive vs. negative moral behaviors (Liberman et al., 2018; see also Mulvey, 2016). We reasoned that episodic information would be better suited to show relative differences between the information types because it would be considered relatively less important than either conventional or moral information, and children would thus be more likely to randomly choose an ingroup member. However, considering the well-documented strong ingroup preferences of children within the tested age range, as established in the literature, we might not observe the group relevant informing expectations, especially among the tested population (see below). As a follow-up, in two subsequent experiments, we further tested conditions in which children's sensitivity to informational relevance specific to an outgroup member might be heightened.

Kurdish children living in Iraq were tested. Given their lack of representation in existing literature, we provide ethnographic information in the Supplementary Materials. However, here we highlight several important points related to the present research. Kurdish people in Iraq live within a fairly homogeneous ethnic, linguistic, and religious community (Leezenberg, 2021). Currently, they have their own independent government in the northern parts of Iraq but historically, Kurdish people have experienced various forms of discrimination, marginalization and even violence (Kurdistan Region Statistics Office, 2018; 2021; Rogg & Rimscha, 2007). In particular, the villages where the tested children came from are predominantly Kurdish, with no Arabic individuals residing in the immediate vicinity. Children in the school were all Kurdish. It should be noted that there have been instances in the past where Arabic individuals resided temporarily in the villages due to conflicts in their place of origin. During these periods, they could either attend an Arabic public school provided by the government or a private school that offered instruction in Arabic. These distinctive features provide an interesting case where in-group preferences could be notably heightened among the children being tested. Some group membership statuses, like ethnicity and race, are perceived as more enduring and stable than others, such as school affiliations. However, racial group membership can be overridden by emerging affiliations (e.g., Kurzban et al., 2001). At the same time, studies using a minimal group paradigm demonstrate that seemingly arbitrary features can easily denote group membership status (e.g., Dunham et al., 2011; Tajfel & Turner, 1986). Notably, school affiliations effectively elicit strong ingroup bias in both children (e.g., Fehr et al., 2008) and adults (e.g., Coman & Hirst, 2015). Together, this suggests that individuals' group thinking is flexibly adjusted under different circumstances. Given the historical marginalization and prejudice against Kurdish people, and considering that the tested children live in a homogeneous environment we reasoned that ingroup thinking could be readily activated among Kurdish children when they are invited to consider group membership in general. To our knowledge, no prior studies have tested Kurdish children. Therefore, the present research will provide valuable insights into the generalizability of children's reasoning about social group membership which has typically been investigated in WEIRD societies (Henrich et al., 2010).

1. Experiment 1

In Experiment 1, children were presented with a main child character and two additional characters. One of the additional characters was described as attending the same school as the main character (i.e., an ingroup member) while the other was described as attending a different school (i.e., an outgroup member). In the conventional task children were told about the school norms at the main character's school and in the episodic task children were told about the contents of a box. Following this, children were asked whether they thought the main character would share the information with an ingroup member or an outgroup member. We expected that children would be more likely to choose an ingroup member in the conventional task than in the episodic task. Additionally, we explored the reasons behind children's responses. Prior studies report that around age 5 children spontaneously recognize distinctions among social categories and exhibit group preference and bias (e.g., Aboud, 2003; Dunham et al., 2011; Over, 2018). Similar research on selective informing and teaching often tests a broader age range typically ages 5 and 6. However, we decided to focus on 6-year-olds to ensure that children had at least some kindergarten experience as our ingroup-outgroup manipulation concerned whether someone is going to the same or a different school.

1.1. Method

1.1.1. Participants

Sixty (30 boys, 30 girls) 6-year-olds ($M = 75.14$ months, $SD = 3.65$) participated in the study. These children attended a local kindergarten in northern Iraq. All children came from middle class backgrounds. They were all native Kurdish speakers. One additional 5-year-old child was tested but excluded from final data analyses due to not providing any responses. A sample size of 52 was deemed sufficient to detect an effect size of Cohen's $d = .40$ in a two-tailed paired t-test with 80 % power. The determination of this sample size took into account the following considerations: An effect size of Cohen's $d = 0.40$ was selected signifying a medium effect size based on prior research in similar contexts (e.g., Karadağ & Soley, 2023). The sample size was also considered feasible given the available resources and recruitment timeframe. The study was approved by the Ethics committee at [masked for blind review].

The children in the present research were recruited from public schools in the Hajiawa district of Sulaimani province in Iraqi Kurdistan, and they spoke Central Kurdish. Their families practiced Sunni Islam.

1.1.2. Materials

The second author, a native Iraqi Kurd, selected child photos (three photos for each gender) from the internet that belonged to the public domain, considering dimensions such as attractiveness and intelligence. Kurdish adults (N = 12, 6 females, 6 males, mean age = 24.83, age range = 20 ~ 31) rated the selected child photos based on attractiveness, intelligence, friendliness, and positivity, with similar ratings observed among the three photos of the same gender. The child names used in the study were Kurdish. Each test item was accompanied by relevant photos, which were also found on the internet and belonged to the public domain.

1.1.3. Design and procedure

A trained native Kurdish male experimenter tested individual children in a quiet room in their school. The experimental session consisted of an establishment phase followed by a test phase as described below.

1.1.4. Establishment phase

Children were shown photos of three children whose gender matched that of the participants. One of the children was designated as the main child character ("This is Danny") and the other two were additional characters. One of the additional characters was described as attending the same school as the main character (making them an ingroup member) ("This is Sammy. He goes to the same school as Danny") while the other was described as attending a different school (making them an outgroup member) ("This is Muhamad. He goes to a different school"). The group membership was also indicated by colored stars (either yellow or blue) although this was not verbally mentioned by the experimenter. The purpose of the stars was to help the children remember the group membership status. An example of photo stimuli is shown in Fig. 1. To ensure that the children understood the group membership status of the three presented characters, they were asked the following comprehension questions: "Who goes to the same school as Danny? Who goes to a different school?" All children answered both questions accurately.

Test phase. Immediately after the establishment phase, children received two tasks ("conventional" and "episodic"), 3 trials in each task. In the conventional task, children were told about the main character's school norms in each trial (i.e., greeting their teacher by dancing; wearing their special costumes to school on Thursdays; using a sanitizer to clean their hands before lunch). For example, children were told, "In Danny's school, when children arrive at school in the morning, they greet their teacher with little dancing." Subsequently, children were asked who they thought the target child would tell and to justify their response ("Danny is going to tell one of them about this. Who do you think Danny will tell how children greet their teacher when they first arrive at school? Sammy or Muhamad? Why?"). In the episodic task, children were told about the hidden contents of a box (i.e., a book; a toy truck; a stuffed animal) and were asked who they thought the main character would tell (e.g., "There is a book inside the box. Danny is going to tell one of them about this. Who do you think Danny will tell what's inside the box? Sammy or Muhamad? Why?"). During both tasks, the photos of the child characters remained visible and the experimenter pointed to the photos as he mentioned their names. The order of the task and which child character (Sammy or Muhamad) went to the same school as the main character (Danny) and which color (yellow or blue) was used for an ingroup member status were counterbalanced across participants. The order of the trials in each task and the name-photo pairs were fixed. The entire script of the tasks as well as photo stimuli used in the present research are available at: https://osf.io/yq6ca/?view_only=c968648b922d48de8d5e1d9df1e37260.

At the end of the study all children completed a standard false belief task involving a location change (the Sally-Anne task, Baron-Cohen et al., 1985) using Kurdish names. Past research suggests that children's theory of mind is related to their information sharing and teaching, particularly concerning the understanding that information sharing is targeted towards those who lack information due to either ignorance or misinformation (e.g., Ziv & Frye, 2004). We included the false belief task because we lack information about the theory of mind development in Iraqi Kurdish children, and some studies report cultural variations in children's theory of mind development (e.g., Mayer, & Träuble, 2015). The results of this task are reported in the Supplementary Materials. The majority of the children in all three experiments passed the task.

Coding. *Children's ingroup choice.* Children received a score of 1 for choosing the ingroup member and a score of 0 for choosing the outgroup member in each trial. Scores ranged from 0 to 3 in each task.

Children's justification. Children's justifications (responses to why they chose the ingroup or the outgroup member) were coded in the following way. We identified two separate justification types: 1) group affiliation (e.g., "Because they go to the same (a different) school"; "Because they are friends"[1]) and 2) knowledge states (e.g., "Because she does/does not know") in each trial. All children's responses belonged to one of the justification types except for one child who responded "I don't know" and another child who responded "I love her" in all trials. Four children referred to the same or different color in at least one trial and these responses did not receive a score. Two coders who were blind to research hypotheses independently coded all the data, and interrater reliability was 100 % (the same for Experiment 2 and 3).

Analysis plan. We analyzed the data by comparing children's responses in the two tasks using repeated measures binary logistic regression with subject and item included as random effects. We also analyzed children's justification data.

All the data that support the findings of this study are available at: https://osf.io/yq6ca/?view_only=c968648b922d48de8d5e1d9df1e37260.

[1] We note that references to friendship constitute a minority within the group justification category: 16 % (17 % in the conventional vs. 15 % in the episodic) in Experiment 1; 3 % (4 % in the conventional vs. 1 % in the episodic) in Experiment 2; 27 % (20 % in the school-episodic vs. 38 % in the person-episodic) in Experiment 3. We also conducted an analysis excluding children's references to friendship, and the findings remained the same. This is reported in the supplementary materials.

Fig. 1. An example of character photo stimuli. The main child character was always positioned at the bottom.

1.2. Results and discussion

Children's ingroup choice. There was no significant difference between the two tasks, $X^2 = .088$, $df = 1$, $p = .767$ ($\beta = -.305$, $SE = 1.03$). An inspection of Fig. 2 indicates that children chose an ingroup member more frequently than an outgroup member in both tasks. One-sample t-tests (tested against 1.5) confirmed this observation: conventional $t(59) = 12.57$, $p < .001$, $d = 1.62$, and episodic $t(59) = 10.36$, $p < .001$, $d = 1.34$.

Children's justification. Fig. 3 presents the number of trials in which children made a reference to either group affiliation or knowledge state as a function of the task type. An inspection of the figure suggests that children predominantly made a reference to group affiliation in justifying their responses irrespective of the task type. To confirm this, children's justification scores were analyzed by a 2 (Task: conventional and episodic) x 2 (Justification: group affiliation and knowledge states) ANOVA with both factors as within-subjects factors.

Only Justification was significant $F(1, 59) = 263.76$, $p < .001$, $\eta_p^2 = .82$, indicating that children justified their response in terms of group affiliation more frequently than in terms of knowledge states. Task was not significant $F(1, 59) = .04$, $p = .837$ nor was the interaction of Task x Justification $F(1, 59) = .33$, $p = .568$.

In Experiment 1, children responded that the main character would choose an ingroup member to inform about the contents of a box as well as school norms. In fact, in both tasks children rarely selected an outgroup member. These findings align with previous research on young children's ingroup preferences (e.g., Dunham et al., 2011). Given the strong ingroup preferences observed in Experiment 1 which obscured the distinction between the information types, in subsequent experiments, we examined the circumstances under which children might select an outgroup member by highlighting the informational relevance for the outgroup member. Our expectation was that children's selection of an ingroup member would be modulated by the information type.

2. Experiment 2

In Experiment 2, in the conventional task children were told that the main character had learned about an *outgroup* member's school norms and the two other characters were new students at their schools. We emphasized the informational relevance of the outgroup member by introducing the characters (both ingroup and outgroup members) as new students at their schools because new members are more likely to be regarded as in need of reminders – if not considered ignorant – about the school norms. The same episodic task as in Experiment 1 was used. As in Experiment 1, children were asked who they thought the main character would choose to inform. We expected that children would choose an ingroup member more frequently in the episodic task than in the conventional task.

2.1. Method

2.1.1. Participants

A new group of 6-year-old children ($N = 60$, 34 girls, 26 boys, $M = 78.63$, $SD = 2.89$) participated in the study. They came from the same population as in Experiment 1.

2.1.2. Design and procedure

The same establishment phase as in Experiment 1 was used except for the following change. Children were told that both potential recipients of information (an ingroup member and an outgroup member) were new to their respective schools ("Sammy and Muhamad are new students at their schools"). No child failed at the comprehension check questions asking about the group membership status.

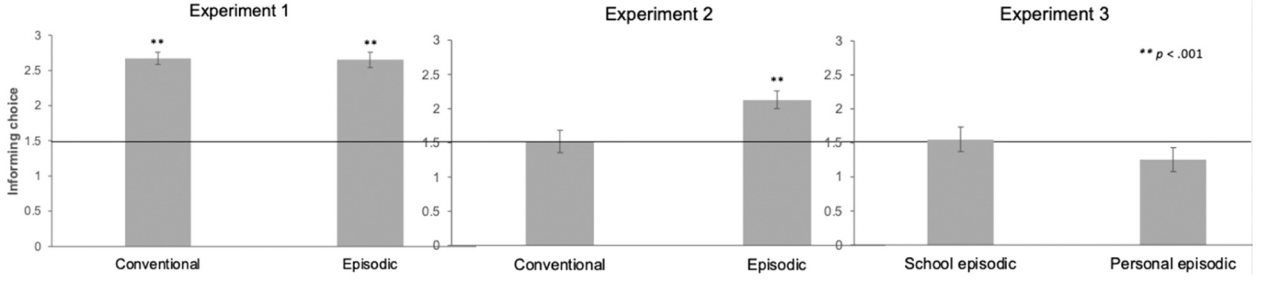

Fig. 2. Children's informing choice of an ingroup member (as opposed to an outgroup member). The error bars indicate the standard error of mean. In Experiment 1, the target information to be shared in the conventional task pertained to an ingroup member's school norm whereas in Experiment 2, it involved an outgroup member's school norm, between an ingroup and an outgroup member who were new to their respective schools.

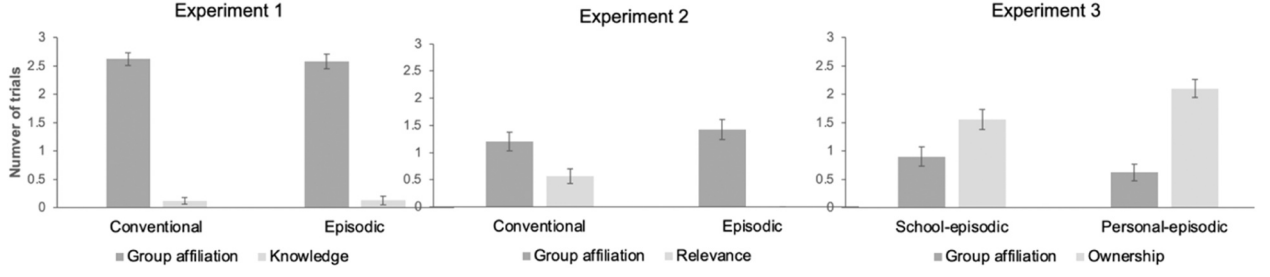

Fig. 3. The number of trials in which children made a reference to either group affiliation or knowledge states (Experiment 1); Relevance (Experiment 2); Ownership (Experiment 3) as a function of the task type. The error bars indicate the standard error of mean.

2.1.3. Test phase

In the conventional task, children were told that the main character learned about the outgroup member's school norms and were asked to predict which character the main character would inform (e.g., "In Muhamad's school, when children arrive at school in the morning they greet their teacher with little dancing. Danny just learned about this and he is going to tell one of them about this. Who do you think Danny will tell how children at Muhamad 's school greet their teacher when they first arrive at school? Sammy or Muhamad? Why?"). The same episodic task (i.e., the contents of a box) as in Experiment 1 was used. The same counterbalanced order as well as the same scoring as in Experiment 1 were adopted.

2.1.4. Coding

Children's ingroup choice. The same scoring was adopted as in Experiment 1.

Children's Justification. Children's justification belonged to the following 2 main categories (53 % of the entire responses): group affiliation and relevance (the information is relevant to the outgroup member: e.g., "Because it's her school"; "Because this is what they do in his school"). Other minor responses which we did not include in the data analyses concerned knowledge or desire state (13 %) (e.g., "Because she does/does not know"; "Because she wants to know"), ownership status (2 %) (e.g., "Because it belongs to her") or unclear/irrelevant responses (14 %) (e.g., "Because it has a car inside"). Twelve children referred to the same/different color in at least one trial and as in Experiment 1 these responses did not receive a score.

2.1.5. Analysis plan

The same analyses as in Experiment 1 were conducted.

2.1.6. Results and discussion

Children's ingroup choice. Consistent with our expectation, children chose an ingroup member more frequently in the episodic than in the conventional task, $X^2 = 8.79$, $df = 1$, $p = .003$ ($\beta = 1.227$, $SE = .414$). Children selected an ingroup member more frequently than an outgroup member in the episodic task $t\,(59) = 4.75$, $p < .001$, $d = .61$, but not in the conventional task $t\,(59) = .010$, $p = .921$. See Fig. 2.

Children's justification. The same 2 × 2 repeated ANOVA as in Experiment 1 was conducted. Justification was significant $F(1, 59) = 27.71$, $p < .001$, $\eta_p^2 = .32$ as well as an interaction of Task x Justification $F(1, 59) = 11.79$, $p = .001$, $\eta_p^2 = .17$. Children referred to group affiliation more frequently than relevance in both tasks: conventional $F(1, 59) = 5.92$, $p = .018$ and episodic $F(1, 59) = 58.92$, $p < .001$. However, children referred to group affiliation in the conventional task as frequently as in the episodic task $F(1, 59) = 1.93$, $p = .170$ whereas they referred to relevance in the conventional task more frequently than in the episodic task $F(1, 59) = 18.12$, $p < .001$. Task was not significant $F(1, 59) = 3.82$, $p = .056$. See Fig. 3.

The findings suggest that children are sensitive to the informational relevance, in this case, an outgroup member's school norms. However, in the conventional task an outgroup member's name was repeatedly mentioned, which might have influenced children's response, leading them to choose the outgroup member. In Experiment 3, we sought to address this issue by equally repeating an outgroup member's name in both tasks. Additionally, Experiment 3 aimed to further confirm children's sensitivity to informational relevance by highlighting informational relevance in a different context - in terms of an outgroup member's ownership (e.g., Kim & Kalish, 2009; Pesowski & Friedman, 2018; Rossano et al., 2011 for preschool-aged children's understanding of ownership; see Nancekivell et al., 2019 for a review). We compared this to another episodic knowledge that concerned some arbitrary facts (not school norms) about an outgroup member's school.

3. Experiment 3

In Experiment 3, children were presented with two different episodic tasks. In one task, they were told that the main character had learned some facts about an outgroup member's school while in the other task they were told that the main character had found an outgroup member's lost items. As in previous experiments, children were then asked to predict whom the main character would choose to inform. The outgroup member's name was repeated an equal number of times in both tasks. Children were expected to choose an ingroup member more frequently when the information pertained to arbitrary facts about an outgroup member's school than when it pertained to an outgroup member's lost items.

3.1. Method

We used the same method as in Experiment 1 except for the following changes.

3.2. Participants

Sixty (30 girls, 30 boys) 6-year-old ($M = 76.72$, $SD = 2.74$) participated in the study. They came from the same population as in previous experiments. An additional child was tested but excluded because she did not respond to any questions during the test phase.

3.3. Design and procedure

The same establishment phase as in Experiment 1 was used; thus, unlike Experiment 2, we did not mention that the two potential

information recipients were new to their schools. All children answered correctly to the comprehension questions. One child incorrectly answered the questions the first time; the establishment phase was repeated and she answered correctly the second time.

3.4. Test phase

Two different episodic tasks were used. In the first task ("school-episodic"), children were told that the main character had just learned something about the outgroup member's school (i.e., a cat with two different colored eyes, a tree with purple flowers, or a big fish tank). For example, children were told, "In Muhamad's school, there is a cat with two different colored eyes. Danny just learned about this and he is going to tell one of them about this." In the second task ("personal-episodic"), children were told that the main character had found something that belonged to the outgroup member (i.e., a new bag, a favorite book, or a bike). For example, children were told, "Muhamad lost his new bag the other day. Danny found a bag on the street that has Muhamad's name on it and he is going to tell one of them about this". In both tasks, as in Experiment 2, children were asked who they thought the main character would choose to inform about the newly learned information. The same counterbalanced order as well as the same scoring as in previous experiments was adopted.

3.5. Coding

Children's ingroup choice. The same coding as Experiment 1 was used. *Justification data.* A majority of children's responses belonged to one of the following 2 main categories (86 % of the entire responses): group affiliation and ownership (e.g., "It belongs to him" "It belongs to this school"). Some minor responses not included in the data analysis concerned: knowledge states (3 %) (e.g., "Because he did not see it"), a finder's ownership rights (1 %) (e.g., "Because he found it") or unclear/irrelevant ones (6 %) (e.g., "Because the cat is beautiful"). Three children referred to the same or different colors in at least one trial and these responses did not receive a score.

4. Results and discussion

Children's ingroup choice. Consistent with our expectation, children chose an ingroup member more frequently in the school-episodic task than in the personal-episodic task $X^2 = 10.3$, $df = 1$, $p = .001$ ($\beta = -1.337$, $SE = .417$). They chose an ingroup member as frequently as an outgroup member in both tasks: school-episodic $t(59) = .27$, $p = .786$, and personal-episodic $t(59) = -1.42$, $p = .160$. See Fig. 2.

Children's justification. We conducted a 2 (Justification: group affiliation and ownership) x 2 (Task: school-episodic and personal-episodic) ANOVA with both factors as within-subjects factors. There was a significant main effect of Justification $F(1, 59) = 16.03$, $p < .001$, $\eta_p^2 = .21$ which was further qualified by Justification x Task $F(1, 59) = 8.90$ $p = .004$, $\eta_p^2 = .13$. Children were more likely to refer to ownership than group affiliation in the personal-episodic task $F(1, 59) = 26.4$, $p < .001$ as well as in the school-episodic task $F(1, 59) = 4.33$, $p = .042$. However, children referred to ownership more frequently in the personal-episodic than in the school-episodic task $F(1, 59) = 9.49$, $p = .003$ whereas children referred to group affiliation more frequently in the school-episodic than in the personal episodic task $F(1, 59) = 4.29$, $p = .043$. A main effect of Task was not significant $F(1, 59) = 3.08$, $p = .084$. See Fig. 3.

As expected, children chose an ingroup member more frequently when the information pertained to some facts (not norms) about an outgroup member's school than when it pertained to an outgroup member's lost items. Notably, children justified their responses by referring to ownership more frequently in the person-episodic task than in the school-episodic task, while they referred to group affiliation more frequently in the school-episodic task than in the personal-episodic task. This seems to suggest that children expected information about an outgroup member's school (not norms as in Experiment 2) to be shared among ingroup members. However, this expectation of ingroup preference seems to be reduced when they were asked about an outgroup member's lost items.

5. General discussion

In the present research we investigated the role of informational relevance on children's expectations of others' selective informing based on group membership. In Experiment 1, children expected others to inform an ingroup member about both arbitrary episodic knowledge (e.g., the contents of a box) and conventional knowledge (e.g., school norms). In experiments 2 and 3, when we highlighted the informational relevance specific to an outgroup member, however, children's expectations about others' informing were modulated depending on the information type. In Experiment 2, children were more inclined to select an outgroup member when the information pertained to the outgroup member's school norms, compared to when it concerned arbitrary facts. Similarly, in Experiment 3, children were more likely to select an outgroup member when the information pertained to an outgroup member's lost items, compared to when it pertained to arbitrary facts (that were not norms) about the outgroup member's school. Finally, children provided relevant justifications in all three experiments.

The findings of Experiment 1 support and extend existing literature on children's ingroup preference (e.g., Aboud, 2003; Dunham et al., 2011). Prior studies have shown that young children's ingroup preference and bias guide their social interactions such as playmate choice, resource allocation, and social learning (e.g., Li & Koenig, 2022; Misch et al., 2016; Over, 2018). The present findings demonstrate that children's ingroup preference also influences their third-party expectations regarding information sharing. Children expected others to share not only information about school norms with an ingroup member (rather than an outgroup member) but also arbitrary facts such as the contents of a box.

The present research presents novel findings from Experiment 2 and 3. The results indicate that when the information was relevant

to an outgroup member, either because it pertained to the school norms of a new outgroup member (Experiment 2) or the lost items belonged to an outgroup member (Experiment 3), children's expectations about others' informing were no longer solely based on group membership. Instead, they expected that others would be more likely to inform an outgroup member about the school norms rather than arbitrary facts (such as the contents of a box). Similarly, they also expected that others would be more likely to share information about the lost items with an outgroup member than arbitrary facts about the outgroup member's school. Additionally, children justified their responses by referring to the fact that the norms pertained to the outgroup member's school (Experiment 2) or the lost items belonged to the outgroup member (Experiment 3). Therefore, the present research provides the first evidence that children's robust expectation of ingroup preferences can be modulated by considering the informational relevance specific to an outgroup member.

Previous research has demonstrated that children provide information based on the knowledge and competence of others (e.g., Liszkowski et al., 2008; Ziv & Frye, 2004) and also decide whether or not to inform others based on their own knowledge states (Kim et al., 2016). Moreover, they selectively share information by considering the epistemic and social characteristics of the recipient and the nature of the information (e.g., Baer & Friedman, 2018; Danovitch, 2020; Pueschel et al., 2023; Ronfard & Harris, 2018; Schmidt et al., 2012). The present study, along with these previous findings, suggests that children consider multiple factors in their selective informing and teaching (Tong et al., 2020).

Specifically, our findings suggest that children consider informational relevance specific to recipients in a third-party informing context. Children and even infants understand others' communicative intent and informational relevance (e.g., Henderson et al., 2013; Liberman et al., 2020; Southgate et al., 2009). Similar to adults, children's communication is likely to be governed by a set of assumptions and principles, one of which is to provide truthful and relevant information (Sperber & Wilson, 1995). In light of this, a possible hypothesis is that children's informing decisions are guided by their expectation and understanding of informational relevance. The present findings provide evidence to this claim. Children did not expect others to blindly select an ingroup member over an outgroup member in knowledge transmission. Instead, they were capable of examining what piece of information was relevant to whom.

Previous research has typically defined relevance as new information from the recipient's perspective. Here, we propose a broader conceptualization of informational relevance. Our findings suggest that children's consideration of relevance goes beyond others' lack of knowledge (note that in all three experiments, children's reference to knowledge states was quite rare) and includes whether the information is meaningful and important to the recipient for various reasons– either because the recipient was a new student (and knowing the school norms is important) or because the information pertained to the recipient's lost items. From this perspective, providing seemingly redundant information as observed in Experiment 1 (where children still expected others to inform an ingroup member about school norms despite the high likelihood of the ingroup member already knowing), may serve the purpose of conveying relevant information. In real-life situations, people often provide redundant information, and teachers and parents intentionally repeat their teachings. Although this may seem inefficient for knowledge transmission, it can emphasize the significance of the information. This broader understanding of relevance could also offer a comprehensive interpretive framework for previous findings on the influence of various factors on children's selective informing and teaching. Future studies should examine how children and adults delineate the boundaries of relevance and which cues and factors they prioritize in determining relevance.

Importantly, our findings make a valuable addition to the literature on children's ingroup bias and preference. They align with established findings that highlight children's pronounced ingroup preferences which extend to expectations of others' behaviors. However, our study goes beyond this by suggesting that children's expectations of others' ingroup preference, under certain circumstances, can be modulated. More precisely, the children in the present research demonstrated group-specific reasoning, considering the relevance of the information to outgroup members. As discussed in the Introduction Kurdish children in Iraq live in a highly homogeneous ethnic environment and historically, the Kurdish people have faced constant discrimination. Therefore, while the strong expectation of ingroup preference by children in Experiment 1 is not surprising, the reduction of this tendency, expecting others to share information with an out-group member in Experiment 2 and 3, is even more noteworthy. Another contribution to the literature is that we tested Kurdish children living in Iraq, a non-WEIRD sample (Henrich et al., 2010). Children's social learning and teaching are both culturally specific and universal (e.g., Kim et al., 2018; Kline, 2015; Lucas et al., 2013; Shneidman et al., 2016). The way one's pedagogical intention signals informational relevance might be culturally different (Shneidman et al., 2016) or the importance of knowledge states for informational relevance analysis may depend on a specific culture (Kim et al., 2018). Speculatively, the relative importance of different factors for children's relevance analysis may be culturally specific while children's flexible consideration based on informational relevance is universal. In our study, children's reference to ingroup status in their justification together with their overall strong ingroup preference in their expectation of others' selection of informational recipients may reflect the heightened importance of ingroup thinking in Iraqi Kurdish culture. Their understanding of what counts as relevant information is also likely to be guided by cultural beliefs and assumptions about teaching, informing, and social interaction more generally (Shneidman et al., 2016). Therefore, future studies should test whether the present findings are generalizable to children from different populations.

It is worth noting that our research focused on children's third-party expectations rather than their actual information sharing. As mentioned in the Introduction, this approach was chosen to minimize potential influence from children's own social motives on their responses. However, future studies should examine whether their actual informing aligns with their third-party expectations. Furthermore, group membership was established in terms of whether the presented child characters attended the same school. Given that Iraqi Kurdish children in the present research live in a highly homogeneous community, this type of group membership manipulation together with examining third party expectations may have impacted otherwise robust ingroup preference as children might readily perceive those attending a different school as still belonging to the same ingroup (i.e., being Kurdish). Although children seem to understand relevant information based on different group affiliations (e.g., Liberman et al., 2020), future studies should

examine the role of informational relevance on children's own selective informing behavior, using various group manipulations. On the other hand, although children's selection of an information recipient was modulated by the information type, we observed that in experiments 2 (the conventional task) and 3 (both tasks) children's selection of an outgroup member was at a chance level and their selection of an ingroup member was significantly above chance in both tasks in Experiment 1. These observations suggest that the current group manipulation was effective in eliciting ingroup reasoning and preference among Kurdish children. Finally, the characters' knowledge states were not explicitly stated in our study and thus group membership status may have been relatively more salient. Future studies should systematically investigate which factors children prioritize in their informing decisions and expectations. Nevertheless, the present research suggests that children use informational relevance to flexibly guide their expectations about others' selective informing.

The present findings have further important implications. Children's expectation that seemingly redundant or repeated information will be shared among ingroup members may serve the function of strengthening culturally important information and/or solidifying or broadcasting group related self-identities. Prior studies examining children's consideration of informational relevance to an outgroup member in their informing and teaching have focused on the moral domain (e.g., Karadağ & Soley, 2023; Schmidt et al., 2012). In other words, children do understand that information pertaining to the moral domain applies to both ingroup and outgroup members, leading them to equally direct their informing towards members of different groups. However, this does not tell us whom children prefer to inform nor does it show that ingroup preference is reduced. The present findings demonstrate that children's ingroup preference guides their expectations about informing. This may also imply that children readily assume common knowledge among ingroup members and potentially limit outgroup members' access to information, especially when resources are limited or one's effort is taxed. The findings of Experiment 2 and 3 further suggest that it may be particularly important to explicitly indicate the informational relevance specific to an outgroup member.

In conclusion, our study highlights children's flexibility in their expectations regarding informing based on group membership. Our findings suggest that children expect others to share relevant information among members of the same cultural group and also to transmit relevant information to social outgroup members. Thus, informational relevance may be a possible mechanism by which humans maintain and strengthen culturally specific knowledge and practices.

CRediT authorship contribution statement

Sunae Kim: Writing – review & editing, Writing – original draft, Supervision, Resources, Methodology, Conceptualization, Formal analysis. **Mariwan Arif:** Data collection, Formal analysis.

Data availability

I have shared the link to data.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.cogdev.2024.101472.

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