THE ROLE OF IGNORANCE IN INFERENCES ABOUT OTHERS' SOCIAL IDENTITIES: A DEVELOPMENTAL STUDY

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DECLARATION OF ORIGINALITY

I, Güneş Öner, certify that

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ABSTRACT

The Role of Ignorance in Inferences About Others' Social Identities:

A Developmental Study

Children are sensitive to what others know and use this information to make social inferences about them. What others do not know, or ignorance, might also be a powerful cue about individuals' social attributes. In two studies, children's social identity attributions based on what others do and do not know were investigated. Whether children's own knowledge state has a role in this process and whether children differentiate between knowledge types when making social inferences, were also examined. Seven- and 8-year-old children (N = 100) were shown targets who were knowledgeable or ignorant of familiar and unfamiliar knowledge items and asked to guess targets' language. Items were about culture-specific (e.g., food or national flag) or general (e.g., shape of earth) knowledge. Both 7- and 8-year-olds used others' ignorance as well as their knowledge to make social identity judgments, however, knowledge yielded stronger inferences than ignorance. Children adjusted their inferences based on their own knowledge state (knowledgeable or ignorant) and also prioritized cultural knowledge as a marker in their social inferences. Social identity judgments of 8-year-olds were more sensitive to their own and others' knowledge states and type of knowledge compared to 7-year-olds' responses. These findings contribute to our understanding about children's sensitivity to others' epistemic states as well the social implications of such sensitivity.

ÖZET

Bilgisizliğin Başkalarının Sosyal Kimlikleri Hakkındaki Çıkarımlarda Rolü: Gelişimsel Bir Çalışma

Çocuklar başkalarının ne bildiğine karşı duyarlıdır ve bu bilgiyi kişiler hakkında sosyal çıkarımlar yapmak üzere kullanırlar. Başkalarının ne bilmediği de, yani bilgisizlikleri de, bu kişilerin sosyal nitelikleri hakkında güçlü bir ipucu olabilir. İki çalışmada, çocukların başkalarının bilgi sahibi olup olmamasına dayalı olarak yaptıkları sosyal kimlik atıfları araştırıldı. Ayrıca çocukların kendi bilgi durumlarının bu süreçte bir rolü olup olmadığı ve sosyal çıkarımlar yaparken bilgi türlerini ayrıştırıp ayrıştırmadıkları da incelendi. Bunun için, 7 ve 8 yaşındaki çocuklara (N = 100) tanıdık ve tanıdık olmayan öğeler hakkında bilgili ya da bilgisiz hedef kişiler gösterildi ve bu kişilerin hangi dili konuştuğunu tahmin etmeleri istendi. Çalışmada kullanılan öğeler, kültüre özgü (ör. yemek veya ulusal bayrak) veya genel (ör. dünyanın şekli) bilgiyle ilgiliydi. Hem 7 hem de 8 yaşındakiler başkalarının bilgisi kadar bilgisizliğini de sosyal kimlik çıkarımlarında kullandılar, ancak bilgi, bilgisizliğe göre daha güçlü çıkarımlar yapmalarına imkan sağladı. Çocuklar çıkarımlarını kendi bilgi durumlarına (bilgili veya bilgisiz) göre farklılaştırdılar ve ayrıca kültüre özgü bilgiyi sosyal bir ipucu olarak önceliklendirdiler. 8 yaşındakilerin sosyal kimlik çıkarımları, 7 yaşındakilerin yanıtlarına kıyasla kendilerinin ve başkalarının bilgi durumu ile bilginin türüne karşı daha duyarlıydı. Bu bulgular, çocukların başkalarının epistemik durumlarına duyarlılığını ve bu duyarlılığın sosyal sonuçlarını anlamamıza katkıda bulunmuştur.

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CHAPTER 1

INTRODUCTION

What individuals know is informative about their social identity. Based on what others know, many social inferences can be made, such as individuals' cultural background, social history, nationality, socio-economic status, profession, gender, or age. For instance, having certain technical knowledge might give cues about a person's profession. Similarly, having detailed knowledge about a particular sports team might indicate being a supporter of that team, or exhibiting knowledge of certain cultural traditions might mark someone's cultural background. Thus, others' knowledge states might help us to make attributions about their social identities. Accordingly, past research showed that, for both adults and children, what others know is informative when making inferences about these individuals' group membership, affiliation, and social history (e.g., Clark, Schreuder, & Buttrick, 1983; Gershman, Pouncy, & Gweon, 2017; Soley & Köseler, 2021; Velez, Bridgers, & Gweon, 2019).

However, knowledge varies in terms of how socially informative it is. For instance, knowing a self-evident fact, such as "birds fly", may not tell much about a person's social history. On the other hand, knowing about some rare fact, or a culture-specific norm or rituals would provide more social information about a person. In fact, previous research suggests that while both children and adults pay attention to others' knowledge when making social inferences about these individuals, they do it selectively for certain types of knowledge (e.g., Soley & Köseler, 2021; Velez et al., 2019). This reveals that children and adults do not simply

assume that people who share knowledge would share social attributes, but rather use specific knowledge to make such social inferences.

While it has been shown that having some types of knowledge marks one's social identity, the social importance of the lack of knowledge has not been investigated. Similar to possession of it, lack of knowledge might also be important for our ability to make social inferences about others. For instance, if an individual does not know about a social norm that is specific to a culture, (e.g., kissing the hands of elders as a sign of respect in the Turkish culture), it may not be plausible to consider that person to belong to that culture. Rather, this might be a cue that this person might belong to another culture with different conventions, norms and rituals. Furthermore, shared ignorance among individuals may provide some clues about these individuals' shared group membership or social identities. For instance, when asked to choose one of the two target children as a friend, 4- and 5-year-olds prefer others who know the same songs as themselves, but also those who are ignorant of songs they themselves don't know (Soley & Spelke, 2016). This might be because children assume that a shared state of ignorance might also signify shared social history. On the other hand, lack of knowledge may not be as powerful as a social cue as possessing knowledge. For instance, while having particular knowledge (e.g., culture-specific or rare knowledge that are not widely shared) might give cues about someone's cultural background (Clark, 1996; Clark et al., 1983; Soley & Köseler, 2021; Velez et al., 2019), just knowing that a person does not have that particular knowledge would only indicate that that person is unlikely to be a member of a particular group, yet it would not give much information about which group that individual belongs to. Therefore, individuals might not be as sensitive to ignorance as they are to what others know.

This thesis aims to address the question of whether children pay attention to knowledge and ignorance of others when making social attributions about these individuals. Previous studies suggest that individuals are quite sensitive to others' knowledge states from an early age (Liszkowski, Carpenter, & Tomasello, 2008) and use this ability to make social choices and inferences (Soley & Köseler, 2021; Soley & Spelke, 2016; Velez et al., 2019). Based upon these findings, firstly, we aimed to replicate findings of Soley and Köseler (2021) by examining children's social attributions about others based on targets' knowledge. In a second study, we explored whether children use others' ignorance as a social cue in their inferences about them. Similar to Soley and Köseler (2021), in both studies, children's sensitivity to different types of knowledge (culture-specific vs. general knowledge) was also investigated. In these two studies, we also explored the role of children's own knowledge states (being knowledgeable vs. ignorant) in their social inferences.

1.1 Children's knowledge and ignorance assessment

Starting from very young ages, children are able to assess their own and others' knowledge based on perceptual cues. Studies suggest that from the age of 12 months, infants can associate seeing with knowing and modify their behavior towards their partner on the basis of what that individual has or has not seen (Liszkowski et al., 2008; O'Neill, 1996; Poulin-Dubois, Sodian, Metz, Tilden, & Schoeppner, 2007; Sodian, Thoermer, & Dietrich, 2006). For instance, in Liszkowski et al. (2008), an experimenter was either watching an object when it fell or she was looking at the opposite side. When the experimenter had not watched the event, twelve-months-old children were more likely to point the place of the object (Liszkowski et al., 2008). That is, infants drew inferences about the experimenter's epistemic state based on

what she had or had not seen. Similarly, preschoolers inform naïve listeners about the events they have not witnessed (Menig-Peterson, 1975; Perner & Leekam, 1986; Pillow, 1989; Saylor, Baird, & Gallerani, 2006) or evaluate third party's knowledge level according to their presence and adjust their communicative behaviors, such as their justifications or reason-giving (Köymen, Mammen, & Tomasello, 2016). These findings indicate that, even very young children understand that direct perception is one of the sources of knowledge. Further, children use seeing-knowing rule to distinguish between knowledgeable and ignorant individuals and adjust their interactions with these individuals accordingly.

Understanding the changeable nature of knowledge is a crucial step in knowledge assessment. For instance, preschool children are sensitive to epistemic changes, that is, they understand that both knowledge growth and knowledge loss or forgetting might occur, both for themselves and for others (Fitneva, 2020). Preschoolers expect that when they grow up, they will be more knowledgeable about things they do not currently know (i.e., rare animals) (Atance & Caza, 2018). Similarly, 4-year-olds predict that they would be more likely to know an unfamiliar toy's name when they become adults (Fitneva, 2020). Moreover, children are aware that their future selves, as well as other children' future selves, may become ignorant of some of the things they know today, implying that knowledge might also fade (Fitneva, 2020).

Distinguishing between different types of knowledge is another key element in the assessment of others' knowledge. Preschool children are not only able to differentiate various forms of knowledge, but they also prefer selectively transmit information based on this judgment (Ronfard & Harris, 2018). Characteristics of knowledge type, such as whether it can be acquired individually by observation or

needs interaction with others, is associated children's predictions about others' knowledge or ignorance. In a recent study, 5- to 11-years-old children readily predicted that a person who grew up on a deserted island would be knowledgeable about observable facts, such as "birds fly", but due to isolation, the same person would be ignorant about facts such as germs making people sick (Lockhart, Goddu, & Keil, 2015). Therefore, children distinguish between direct knowledge gained from first-hand experience vs. indirect knowledge gained through testimony and use this to determine what others know or do not know.

Children use practical cues, such as mistakes others make, when assessing others' knowledge. For instance, in a teaching context, children use others' mistakes to infer their knowledge level and this ability to track knowledge states based on behavioral evidence improves across the preschool years (Corriveau, Ronfard, & Cui, 2018; Ronfard & Corriveau, 2016). Previous studies have shown that children are also sensitive to the mistakes of others in their learning decisions. If an informant was inaccurate several times in the past, children would be reluctant to accept the information s/he has given, for instance, about a hidden toy's location (Birch, Vauthier, & Bloom, 2008; Ganea, Koenig, & Millett, 2011; Koenig & Harris, 2005; Sabbagh & Baldwin, 2001). Thus, children consider mistakes as a benchmark of others' knowledgeability and shape their own learning or teaching behaviors based on these judgments. Linguistic cues also help children assess others' knowledge states. Preschool-age children notice the linguistic indications of knowledgeability or ignorance (e.g., "I think this is a spoon"; "I know this is a spoon"; "I don't know what a blicket is") and use these indicators to selectively trust knowledgeable individuals (e.g., Jaswal & Malone, 2007; Koenig & Harris, 2005; Sabbagh & Baldwin, 2001).

Children are also sensitive to individuals' characteristics such as their expertise or age when attributing knowledge or ignorance to others. When all else is equal, children evaluate adults as more knowledgeable than children (Taylor, Cartwright, & Bowden, 1991) and they expect an individual's knowledge to differ based on expertise (Danovitch & Keil, 2004, 2007; Lutz & Keil, 2002; Taylor, Esbensen, & Bennett, 1994; VanderBorght & Jaswal, 2009). For instance, VanderBorght and Jaswal (2009) showed that preschoolers selectively consult their peers when they need information about toys, and prefer to direct their questions about another domain, such as the nutritional value of foods, to adults, which implies that they are capable of evaluating differentiated knowledge types that different groups have.

Another cue children use when assessing others' knowledge states is their familiarity. Young children have a tendency to attribute ignorance more to out-group members, such as unfamiliar or foreign language speaking individuals, rather than in-group members. For instance, when a familiar or an unfamiliar informant had been inaccurate, a greater proportion of 3 and 4 years-old children made attributions of ignorance to the unfamiliar informant as compared to familiar informant (Corriveau & Harris, 2009). Similarly, 3 to 5 years-old children attribute ignorance more to non-native speakers and deliberate mistakes or pretense more to native speakers in inaccuracy conditions when native and non-native accents were contrasted (Corriveau, Kinzler, & Harris, 2013). While being an in-group member in a domain would not imply expertise about an irrelevant domain for adults (for example, it is not necessary for someone on the same sports team as you to be knowledgeable about domains unrelated to sports), children display in-group bias even in minimal group paradigm and they tend to trust in-group informants rather than outgroup

informants (Elashi & Mills, 2014). Elashi and Mills (2014) have further shown that when 3- to 7-years-old children witnessed in-group members' inaccuracy and out-group members' accuracy about familiar objects, children's trust for their in-group decreased and they displayed no clear preference for either of the informants' labeling of novel objects. That is, in-group favoritism in trust decisions were so strong that the past accuracy of out-group members only could neutralize their out-group membership. Thus, for preschoolers, a target individual's group membership seems to be leading to unrealistic inferences about that person's knowledge state.

Studies have also examined children's assessment of own knowledge/ignorance. Meta-ignorance is the ability where individuals recognize and report their own lack of knowledge. Previous research has shown that children's understanding and communicating their own state of ignorance seems complicated and develops gradually (for a review, see Harris, Bartz, & Rowe, 2017). Toddlers are able to ask for help or use gestures to show their own ignorance (Acredolo & Goodwyn, 1985; Goupil, Romand-Monnier, & Kouider, 2016) and preschool children accurately assess their ignorance when informing other persons (Kim, Paulus, Sodian, & Proust, 2016). Kim and her colleagues (2016) showed that, when 3- to 4-year-old children were partially ignorant about the content of a box (i.e., they knew one of the two toys was hidden in a box, but they did not know which particular toy was in it because they did not see the hiding event), they were more likely to decline to inform ignorant others. However, when they were explicitly assessed about their knowledge (i.e., ''Do you know now which toy is inside or do you not know?''), children younger than 6 years-old had some difficulties about admitting their ignorance and presented a bias to over-report their knowledge (Kloo, Rohwer, & Perner, 2017; Rohwer, Kloo, & Perner, 2012). Thus, children's explicit

meta-cognitive abilities about ignorance develops gradually, although an implicit understanding guides their behaviors earlier in life.

1.2 Conventionality of knowledge

Children expect certain knowledge to be shared among members of a social group and have an understanding about the conventionality of culturally shared knowledge (e.g., Diesendruck & Markson, 2011). For instance, infants as young as 9 months old generalize an individual's object labeling behavior to another individual, on the other hand, they do not generalize preferences across individuals (Henderson & Woodward, 2012). Starting from 14 months-old, young children selectively imitate novel actions introduced by their own linguistic group (e.g., Buttelmann, Zmyj, Daum, & Carpenter, 2013; Kinzler, Corriveau, & Harris, 2011) and 2 years-old toddlers expect linguistic in-group and out-group members (native vs. foreign language speaking individuals) to behave differently in culturally regulated domains, such as tool usage (Peto, Olah, & Kiraly, 2021). If children are asked to attribute conventional and unconventional behaviors to native or foreign speakers, they have stronger expectations for in-group members to conform to social conventions (i.e., being quiet in the library) and out-group members to break them (Liberman, Howard, Vasquez, & Woodward, 2018). Further, 18-month-old infants enforce others to act in a normative way (Schmidt, Rakoczy, & Tomasello, 2019). Similarly, 3-years-old children are more likely to imitate behaviors of an individual who conform to the conventional norms (e.g., cutting up a piece of paper using a pair of scissors) compared to someone who behaves in an unconventional way (e.g., cutting up a banana using a pair of scissors) (Olah & Kiraly, 2019).

These studies suggest that children understand that social norms are to some degree arbitrary, and their existence requires shared assignment and acceptance of the group members such that they do not necessarily apply to all individuals, but rather to those individuals who are members of a particular group (Diesendruck & Markson, 2011; Rakoczy & Schmidt, 2013; Schmidt & Tomasello, 2012). Children's understanding of conventionality of social norms is often contrasted with their understanding of moral norms, which are non-arbitrary principles about how to behave in a given morally relevant situation. Such studies showed, for instance, that children assume conventions like social norms should be known and respected by in-group members, whereas moral norms (e.g., helping someone on the playground, sharing toys with classmates, or not making somebody cry), should be followed by in-group and out-group members equally (Liberman et al., 2018; Schmidt, Rakoczy, & Tomasello, 2012). Schmidt and colleagues (2012) showed that when two puppets' ingroup vs. outgroup distinction is established for children by using accent (whether puppet has native or foreign accent), symbolic markers (whether puppet wears same or different color bracelet with children), linguistic markers ("We're Daxos", "He is a Fendi") or familiarity (whether puppet is familiar to the child and experimenter or not), 3-year-olds protested only in-group members' violations of conventional game rules, whereas they enforced moral norms, like not harming, equally on both in-group and out-group members. Together, these findings suggest that knowledgeability of an individual about group-specific norms provides children an important tool to associate this certain type of knowledge and group-membership.

Children not only associate social norms and group-membership, but they also expect other forms of cultural knowledge to be known by group members. When an experimenter expressed recognition or ignorance about culturally familiar or

novel objects without specifying which object she was referring to, 3- and 5-year-old children flexibly inferred that the experimenter referred to the culturally well-known object with the expression of recognition and the novel object with the expression of ignorance (Liebal, Carpenter & Tomasello, 2013). Children and adults attribute shared cultural knowledge, such as knowledge of songs, more to the members of the same social group both when groups are marked by the clothing color and labeling (Soley, 2019), and when groups are marked by the language individuals speak (Soley & Aldan, 2020), whereas they do not expect preferences for songs to be necessarily confined by group membership (Soley, 2019; Soley & Aldan, 2020).

Acquisition of shared cultural knowledge (e.g., social norms, dance, music, or rituals) requires social interaction with other members of the group (Legare & Harris, 2016; Pagel & Mace, 2004), and possession of these kind of knowledge might signal group boundaries more strongly compared to other kinds of knowledge, like knowledge of general facts that do not necessarily require social interaction. In fact, children distinguish different types of knowledge in their social inferences and make attributions of shared culture-specific knowledge to the people who belong to the same social group, whereas they do not necessarily expect general knowledge to be solely shared by members of a group, but they generalize it to individuals across groups (Soley, 2019). Children also generalize cultural knowledge to individuals from the same group, and this tendency becomes stronger with age. For instance, when children were introduced to a main character and a target character from the same country, older participants (7- to 9-year-olds) expect the target to share both nation-specific knowledge (i.e., the national song of the country) and culture-specific knowledge (e.g., how to celebrate a holiday) with the main character (Liberman, Gerdin, Kinzler, & Shaw, 2020). Whereas younger group (4- to 6-year-olds) only

generalize group-specific knowledge to national group members and expect the target to share knowledge about the national song of the country with the main character (Liberman et al., 2020). It is important to note that people from different nations might still celebrate the same holidays, however, knowledge of a national song is exclusively shared by the people of that nation, so national song and national group association could have been more salient for younger participants of this study. In sum, these results indicate that although all children use social relationships, such as living in the same country, to reason about shared knowledge, children's responses about generalization of cultural knowledge become more robust starting from the age of 7.

1.3 Knowledge-based social preferences and inferences

Shared knowledge of songs also guides of 4- to 5-year-old children's friendship preferences and to a greater degree than shared preferences for songs (Soley & Spelke, 2016). In social decisions like choosing friends, children not only prefer others who know the songs that they are familiar with, but interestingly, children also prefer others who are unfamiliar with the songs they themselves don't know (Soley & Spelke, 2016). These findings might suggest that culture-specific knowledge that is not shared is associated with the possibility of having a different background or being an outgroup, and therefore, social affiliation is avoided. Interestingly, for adults, sharing rare preferences conveys information about similarity in cultural background or social connection.

A recent study demonstrated that, when choosing friends, adult participants prefer those with the same rare preferences as themselves to those with the common preferences (Velez et al., 2019). However, when preference was separated into

knowledge (without preference) and taste (without knowledge) in a follow-up study, shared knowledge influenced individuals' social judgments more strongly than shared taste, implying that the rare preference effect was actually rooted in shared knowledge and knowledge trumps preferences in adults' social judgments as well (Velez et al., 2019).

Similar effects are shown with children. Children not only infer what others would know based on their group membership, but they also take others' knowledge into account when making attributions about individuals' social group membership (Soley & Köseler, 2021). Soley and Köseler (2021) investigated whether children attribute group membership based on shared knowledge and if they do so, whether culture-specific knowledge would be more informative than general knowledge to make these attributions. In each trial of two studies, one target child who was knowledgeable about one of the different knowledge items that were either cultural (e.g., a children's song), or general (i.e., that the world is round) was presented to participants. All these items were familiar to the participants. Following this, participants were asked to guess which language the knowledgeable target would speak (Turkish or French) and/or where the target would live (close by or far away in Study 1 and Turkey or France in Study 2).

The results of Soley and Köseler (2021) showed that, while all groups used knowledge of others to when making group membership inferences about these individuals, by the age of 7, children started to pay attention to knowledge more selectively and prioritized cultural knowledge over general knowledge to make social attributions about others' language and location. Specifically, 7- and 8-year-olds' social inferences about whether the target lives in Turkey or speaks Turkish were more robust when the target was knowledgeable of cultural items compared to the

general items. On the other hand, 6-year-olds did not differentiate cultural and general knowledge in their social attributions.

1.4 The present research

The present research aims to replicate and extend Soley and Köseler's (2021) findings. It asks whether children make social attributions based on others' ignorance as well as their knowledge, whether being knowledgeable or ignorant of different types of knowledge, such as cultural or general, is similarly informative about others' social background, and finally, whether participants' own knowledge states (i.e., being knowledgeable vs. ignorant of items) play a role in guiding their social inferences about others.

For this, a methodology similar to Soley and Köseler (2021) was adopted. Specifically, children were introduced targets who were knowledgeable (Study 1) or ignorant (Study 2) about familiar or unfamiliar cultural and general knowledge items and asked to guess the language they spoke. Similar to Soley and Köseler (2021), language was used as a social group marker in this research, because previous studies show that children categorize and make group membership inferences about novel individuals based on language. For example, they associate culture related social categories like race and nationality with language (Hirschfeld & Gelman, 1997; Kinzler & DeJesus, 2013b) or foreign language with foreign places (Hirschfeld &Gelman, 1997). Similarly, children expect that targets who speak the same language would be more likely to share cultural knowledge compared to targets who speak different languages (Soley & Aldan, 2020).

It is important to highlight some important methodological differences between the current studies and Soley and Köseler (2021). In Soley and Köseler

(2021), both cultural and general knowledge items were familiar to children and the targets were always introduced as being knowledgeable of the items. In the present research, we aimed to extend the scope of Soley and Köseler (2021) and examine the role of being ignorant as well as being knowledgeable. Thus, the items could be both familiar and unfamiliar to the participating children and the targets were introduced as both being ignorant and knowledgeable of these items. In Soley and Köseler, the experimenter verbally expressed each knowledge item, for instance, by saying "This child knows that the earth is round". We instead showed children a relevant visual (e.g., a picture of a rabbit) and said, for instance, "This child knows the favorite food of rabbits". This allowed us to avoid familiarizing children with the unfamiliar knowledge items and make them knowledgeable about them. Second, Soley & Köseler (2021) asked children to make inferences about targets' language and their geographical proximity. Here, we only focused on language, because Soley and Köseler (2021)'s results were similar when children were asked to make inferences about the two social attributes. Third, Soley & Köseler (2021) asked participants to rate how certain they were of their answers with the options of "very sure" and "a little sure". Given that their analyses excluding these answers yielded similar results to their analyses that included these ratings, we dropped the ratings in the current studies. Fourth, in the current studies, we used a made up language as the foreign language, whereas Soley and Köseler (2021) asked children to guess targets' language (Turkish (native) or French (foreign)). Novel, made up groups were previously used in studies in an attempt to explore children's abstract inferences about groups that do not rely on their existing knowledge or potential biases about specific social groups (Baron, Dunham, Banaji, & Carey, 2014; Soley, 2019). Finally, since Soley and Köseler (2021) showed that 7 and 8 years-old children, but

not 6 years-old, used cultural knowledge over general knowledge selectively to make group membership inferences, the current studies were conducted with children who were 7 and 8 years old.

In Study 1, participants were shown a target character who was knowledgeable about familiar and unfamiliar culture-specific items (e.g., traditional food, drink, musical instrument and national flag), and familiar and unfamiliar general knowledge items (e.g., factual knowledge about animals, human body and earth). In Study 2, targets were introduced as being ignorant of the same items. Participants in both studies were asked whether the targets would speak native (Turkish) or foreign language (Batris). I had three pre-registered hypotheses: Based on previous studies, I expected children to be more likely to infer that targets who were knowledgeable about familiar culture-specific items to speak their native language compared to targets who were knowledgeable about unfamiliar culture-specific items (Study 1) and targets who were ignorant about familiar culture-specific items to speak a foreign language compared to targets who were ignorant of unfamiliar culture-specific items (Study 2). For general knowledge items, participants' inferences were expected to be similar across familiar and unfamiliar items. Additionally, 8-year-olds' responses were expected to be more robust compared to 7-year-olds. I had a final hypothesis that children's knowledge level for familiar items would be higher than for unfamiliar items both for cultural and general knowledge items, however, this prediction was no longer relevant after introducing a new exclusion criterion (see below).

CHAPTER 2

STUDY 1

2.1 Method

2.1.1 Participants

Participants were 7-to-9 years old children, who were recruited via Baby and Child Development Laboratory's social media accounts and the current database. All participants were native speakers of Turkish. Ethics approval was obtained from The Ethics Committee for Master and PhD Theses in Social Sciences and Humanities, in Boğaziçi University (see Appendix A). The information of the socioeconomic status of parents was gathered by sending a questionnaire via e-mail before the experiment. Given that this study used similar methodology as Soley and Köseler (2021), their sample size was taken as a base. Accordingly, we planned to test 24 children in each age group.

Final sample included 25 7-years-old (13 female; mean age: 7 y 6 m; range 7 y 1 m – 7 y 9 m) and 25 8-years old (13 female: mean age: 8 y 6 m; range 8 y 0 m – 8 y 9 m) children. An additional 2 children were tested but they were excluded because of parental interference (n = 1) or because the child was bilingual (n = 1).

2.1.2 Materials

Eight culture-specific knowledge items (i.e., food, drink, musical instrument, and national flag) and eight general knowledge items (i.e., factual knowledge about animals, human body, and earth) were compiled. Four of the culture-specific items were familiar items that are specific to participants' culture and the other four were items that belonged to an unfamiliar culture. Four of the general items were familiar,

widely known facts (e.g., the favorite food of rabbits) and the other four were unfamiliar facts (e.g., average daily sleep duration of cats) (see Appendix B for the full list). We created 16 gender-neutral child drawings that were presented along the knowledge items. Child drawings had different facial features, outfit, and hair color. We also compiled 16 different visuals each representing one knowledge item (e.g., Turkish tea image for familiar drink knowledge or an image of a rabbit for the favorite food of rabbits) (see Figure 1).

These visuals were arranged into PowerPoint slides, where the target child appeared on the left side of the slide and the image representing the knowledge item appeared on the right side of the slide.

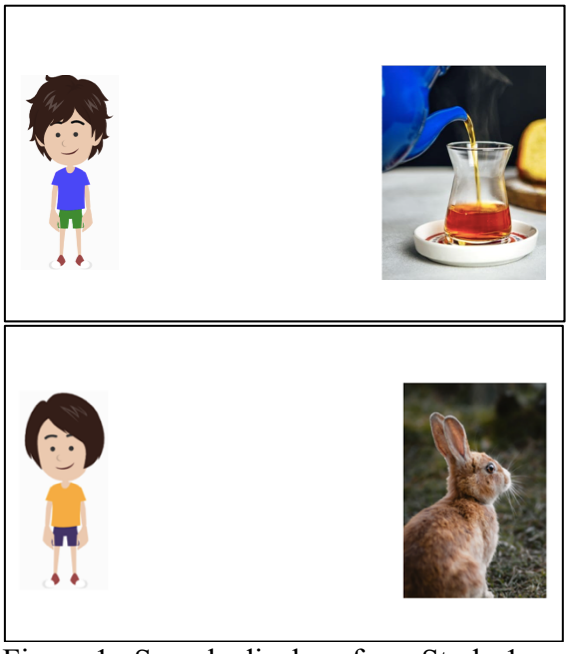


Figure 1. Sample displays from Study 1
Note: Example displays from culture-specific (Turkish tea) and general item (favorite food of rabbits) trials.

2.1.3 Design and procedure

Participants were tested online via Zoom. Before the experiment, children were explained that they would be introduced to new children and asked questions about

them. The children were also told that there were no right or wrong answers to these questions. Experimental session included a warm-up session that was followed by a test session.

2.1.3.1 Warm-up session

The experimenter first obtained the parent's consent and the child's assent. Then the experimenter showed four slides with different color bars and different animals and asked the child to name the specific color or animal on the screen. This warm-up session was initiated to check whether the stimuli were visible to the participant child, and s/he could hear the instructions without any problem, as well as, to warm-up the child to the process.

2.1.3.2 Test session

In the test session, participants were shown each of the sixteen characters one by one and told that the character was knowledgeable about one of the sixteen items. In the trials where cultural items were presented, the experimenter presented the target along with a picture representing the knowledge item as follows: "This child knows this drink" (see Figure 1). In the trials where general items were presented the experimenter presented the target as follows: "This child knows the favorite food of rabbits". Each knowledge item was represented with a different visual. Following this, children were asked whether the target spoke Turkish or Batris.

Cultural and general knowledge items were presented as blocks which were counterbalanced across participants. Thus, half of the children started test session with cultural knowledge block and other half started with general knowledge block. Half of the trials included familiar knowledge items, whereas the other half included

unfamiliar items. Familiarity of the items varied in ABBABAAB order across trials within each knowledge type block (cultural and general). For the half of the participants, a target who was knowledgeable about a familiar item was shown first, and for the other half, a target who was knowledgeable about an unfamiliar item was shown first. The order in which children were presented with familiar and unfamiliar knowledge items was arranged so that children were not presented with two items of the same type (food, drink, musical instrument, and flag) one after another. The matching of child drawings to item familiarity was also counterbalanced, so half of the participants saw certain child drawings along with familiar items and half of the participants saw the same drawings along with unfamiliar items.

At the end of sixteen trials, participants were asked about whether they knew each item in the same order as in the main experiment.

Throughout the test session, the experimenter coded children's answers as "Turkish/Batris" for the main experiment, and as "Yes/No" for the part where children reported their own knowledge about the items. At the end of the experiment, experimenter thanked and debriefed the child and the parent. Children received an e-certificate for the participation.

2.2 Results of Study 1

2.2.1 Scoring

As preregistered (preregistration: https://osf.io/zn9mu), participants' responses were coded by the experimenter as "1" for Turkish and as "0" for Batris. An independent rater controlled %20 of the responses and there was full agreement. If a participant expressed that s/he knew an unfamiliar item or did not know a familiar item, that particular trial's response was coded as NA to be ignored in the analyses. In Study 1,

a total of 25 trials from 20 different participants (out of 800 trials of 50 participants) were excluded. While this was not listed as one of the exclusion criteria in the preregistration, since children's knowledge of unfamiliar items or ignorance of familiar items would prevent us from seeing the effect of familiarity in these trials, we decided to follow this route. Accordingly, the prediction that children's knowledge level for familiar items would be higher than for unfamiliar items both for cultural and general knowledge items could not be tested due to this exclusion criterion.

2.2.2 Results and discussion

Since the study had a within-subject design with multiple observations from each participant, main analyses were conducted using Generalized Linear Mixed-effects Models with binomial distribution and a logit link function GLMM also allowed to incorporate all data variance in the analyses by including random intercepts of participants and items. The analyses were performed with lme4 package (Bates, Mächler, Bolker, & Walker, 2014) on R (R Core Team, 2013).

The response variable was a binomial measure of the target's language (Turkish vs. Batris). The full model included the predictors Age (7 vs. 8), Familiarity (familiar vs. unfamiliar), Knowledge Type (cultural vs. general), possible interactions between these variables and the random intercepts of participant ID and items. We tested the significance of the full model by comparing its fit with a null model lacking Age, Familiarity, Knowledge Type and their interactions. The full model improved the fit ($\chi 2(7) = 39.99$, $p < .001$).

Then the full model was compared with a reduced model that only lacked an interaction term to investigate if that particular interaction contributed the model. If

the comparison between full and reduced models was not significant, that interaction term was dropped and the subsequent analyses continued with the new full model lacking this interaction. Based on this reduction process, two-way interactions between Age and Familiarity, Age and Knowledge Type and three-way interaction of Age, Familiarity and Knowledge Type were reduced from model (all $p_s > .05$). The interaction between Familiarity and Knowledge Type was significant ($\chi 2(1) = 11.33$, $p < .001$), thus, it was included in the model.

Next, each fixed effect was reduced from the model to see its contribution to the model. The reduced model revealed a main effect of Age ($\chi 2(1) = 4.54$, $p = .033$). Overall, younger children had a greater tendency than older children to indicate that the targets would speak Turkish (*Estimate* = .49, *SE* = .23, $p = .029$). The main effect of Familiarity was also significant ($\chi 2(1) = 28.73$, $p < .001$). Children were more likely to infer that targets would speak Turkish when targets were knowledgeable about familiar items compared to unfamiliar items (*Estimate* = 2.94, *SE* = .34, $p < .001$). Finally, results indicated that there was no main effect of Knowledge Type ($\chi 2(1) = 0.003$, $p = .96$) (see Table 1).

The interaction between Familiarity and Knowledge Type ($\chi 2(1) = 11.33$, $p < .001$) was further examined with pairwise comparisons adjusted by tukey. Participants were more likely to infer that targets would speak Turkish when they were knowledgeable of familiar culture-specific items (*Estimate* = 4.24, *SE* = .51, $p < .001$) as well as of general items (*Estimate* = 1.64, *SE* = .43, $p < .001$), However, participants were more likely to infer that targets would speak Turkish when they were knowledgeable of familiar cultural items than they were knowledgeable of familiar general items (*Estimate* = 1.31, *SE* = .50, $p = .042$), and also more likely to

Table 1. Model Summary for Study 1

FIXED EFFECTS	Coefficient	SE
Intercept	.71***	.18
Age	-.17	.12
Familiarity	-1.47***	.17
Knowledge Type	-.001	.16
Familiarity x Knowledge Type	.66***	.17

RANDOM EFFECTS	Variance
Intercepts	
Participant	.20
Item	.26

Note: Significance codes, *** .001, ** .01, * .05

infer that targets would speak Batris when they were knowledgeable of unfamiliar cultural items compared to unfamiliar general items (*Estimate* = -1.28, *SE* = .43, *p* = .014) (see Figure 2).

Overall, the results of Study 1 suggest that children make attributions of social group membership based on what others know. As predicted, we found an interaction between knowledge type and familiarity. However, the specifics of this prediction was only partially fulfilled. Namely, as we predicted the effect of familiarity was stronger for culture-specific items compared to general knowledge items. However, unlike our prediction that there would be no effect of familiarity for general items, children still inferred that targets would speak their native language when they knew familiar general items more than when they knew unfamiliar general items.

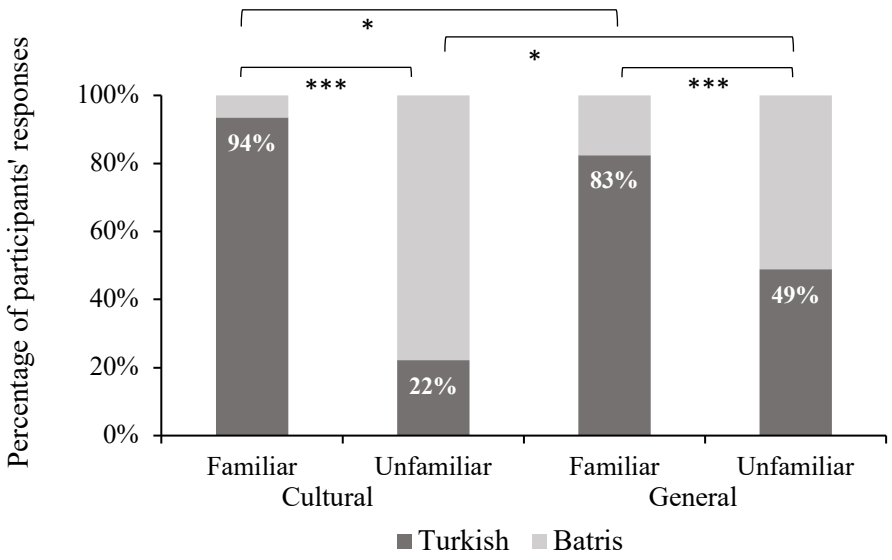


Figure 2. Results of Study 1
Note: The proportion of participants' language choices depending on item familiarity and knowledge type.

Second, we expected a three-way interaction between age, familiarity and knowledge type, given that Soley and Köseler (2021) found that 8-year-olds were more selective in their inferences compared to 7-year-olds. However, unlike this prediction, the trend in the children's language choices depending on item familiarity and knowledge type did not differ between two age groups.

Building on these findings, the next study investigated whether children also make social inferences when targets are introduced as ignorant rather than knowledgeable.

CHAPTER 3

STUDY 2

3.1 Method

Final sample of participants included twenty-four 7-years-old (11 female; mean age: 7 y 7 m; range 7 y 1 m – 7 y 9 m) and twenty-six 8-years old (13 female; mean age: 8 y 5 m; range 8 y 0 m – 8 y 9 m) children. Four additional children were tested but their data were excluded because the child was distracted (n = 2), or bilingual (n = 1), or because of interference (n = 1).

3.2 Results of Study 2

3.2.1 Scoring

The coding was identical to Study 1 and there was a full agreement between the coder and the controller on all of the trials coded (20% of all participants). In Study 2, a total of 18 trials of 15 participants (out of 800 trials of 50 participants) were excluded because the participant said that s/he knew the unfamiliar item or did not know the familiar item of that particular trial.

3.2.2 Results and discussion

Main analyses were conducted using Generalized Linear Mixed-effects Models with binomial distribution and a logit link function as in Study 1. The response variable was the choice of the target's language (Turkish vs. Batris). The full model included the predictors Age (7 vs. 8), Familiarity (familiar vs. unfamiliar), Knowledge Type (cultural vs. general), possible interactions and the random intercepts of participants and items. We tested the significance of the full model by comparing its fit with a

null model lacking Age, Familiarity, Knowledge Type and their interactions. The full model improved the fit ($\chi^2(7) = 46.97$, $p < .001$).

Then we compared the full model with a reduced model which only lacked an interaction term to see which interactions significantly contributed to the model. Since the results were not significant, the two-way interaction between Age and Knowledge Type and the three-way interaction of Age, Familiarity and Knowledge Type were reduced from model (all $p_s > .05$). The interaction between Age and Familiarity ($\chi 2(1) = 12.48$, $p < .001$) and Familiarity and Knowledge Type ($\chi 2(1) = 10.47$, $p = .001$) were significant, so they were kept in the model.

Then each fixed effect was reduced from the model to see its contribution to the model. Results indicated that there was no main effect of Age ($\chi 2(1) = .41$, $p = .52$) and Knowledge Type ($\chi 2(1) = 2.56$, $p = .11$). However, there was a main effect of Familiarity ($\chi 2(1) = 30.81$, $p < .001$) (see Table 2). Participants were more likely to infer that targets would speak Batris when targets were ignorant about familiar items compared to when targets were ignorant about unfamiliar items (*Estimate* = -1.90, *SE* = .21, $p < .001$).

Next the details of the interaction between Age and Familiarity ($\chi 2(1) = 12.48$, $p < .001$) were investigated (see Figure 3). Pairwise comparisons adjusted by tukey revealed that, both age groups were more likely to infer that targets would speak Batris when they were ignorant aboutfamiliar items compared to unfamiliar items (7-year-olds: *Estimate* = -1.28, *SE* = .26, $p < .001$; 8-year-olds: *Estimate* = -2.52, *SE* = .28, $p < .001$).

Table 2. Model Summary for Study 2

FIXED EFFECTS	Coefficient	SE
Intercept	-.71 ***	.12
Age	-.06	.11
Familiarity	.95***	.10
Knowledge Type	-.18	.10
Age x Familiarity	.30***	.09
Familiarity x Knowledge Type	-.38***	.10

RANDOM EFFECTS	Variance
Intercepts	
Participant	.18
Item	.04

Note: Significance codes, *** .001, ** .01, * .05

However, while 7- and 8-year-olds' language choices did not differ in the trials involving unfamiliar items (*Estimate* = -.48, *SE* = .25, *p* = .20), there was a marginally significant difference between two age groups' choices in trials with familiar items (*Estimate* = .75, *SE* = .30, *p* = .059). Although both age groups expected targets to speak Batris when they were ignorant of familiar items, the inferences of 8-year-olds were stronger than 7-year-olds.

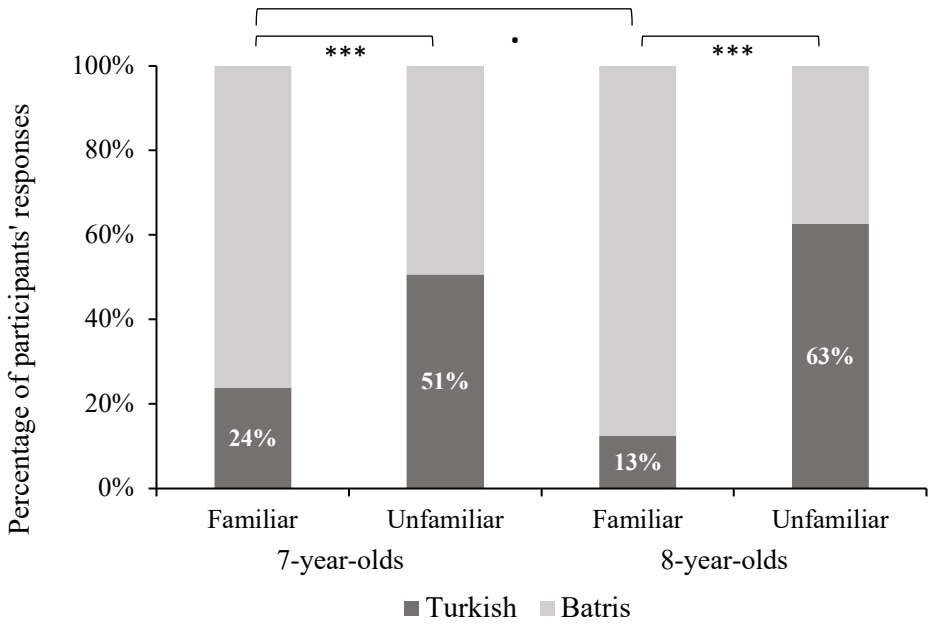


Figure 3. Results of Study 2
Note: The percentages of participants' responses based on age and item familiarity.

The interaction between Familiarity and Knowledge Type ($\chi 2(1) = 10.47$, $p = .001$) was also investigated. Follow up analyses revealed that participants were more likely to infer that targets would speak Batris when they were ignorant of familiar culture-specific items (*Estimate* = -2.67, *SE* = .30, $p < .001$) as well as of general items (*Estimate* = -1.13, *SE* = .28, $p < .001$) (See Figure 4). Results also showed that participants were more inclined to choose Turkish when the targets were ignorant about unfamiliar cultural items compared to unfamiliar general items (*Estimate* = 1.10, *SE* = .26, $p < .001$). There was no difference between participants' choices for ignorance of familiar cultural and general knowledge items (*Estimate* = -.44, *SE* = .31, $p = .48$).

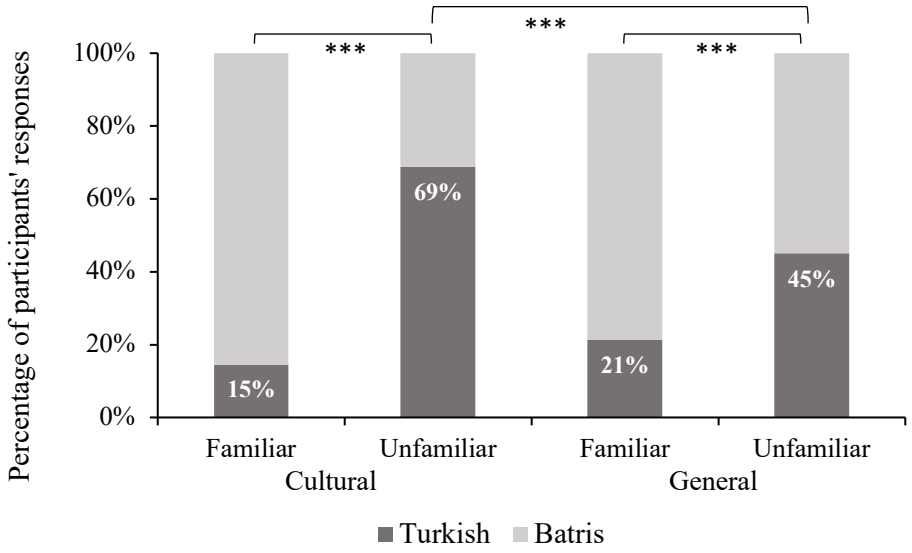


Figure 4. Results of Study 2
Note: The proportion of children's responses depending on item familiarity and knowledge type.

Overall, the results of Study 2 suggest that children make diagnostic social inferences based on others' ignorance. Children assume shared linguistic group membership based on a shared state of ignorance. Further, they expect targets to be outgroups when they are ignorant of things children themselves are knowledgeable of. Unlike what we predicted, and similar to Study 1, children made these group membership inferences regardless of the type of knowledge.

There were also age differences in children's inferences depending on items' familiarity, and this also diverted from our initial prediction where we expected a three-way interaction between age, knowledge type and familiarity. Specifically, older children were more sensitive than younger ones in their inferences when targets did not know something they knew. On the other hand, when there was shared ignorance, 7- and 8-year-olds' inferences that targets would speak Turkish did not differ. Unlike Study 1, in Study 2, the advantage for cultural knowledge items compared to general knowledge items was only apparent for unfamiliar knowledge

items. Thus, culture-specific knowledge seems to be more diagnostic compared to general knowledge, only when targets and children share a state of ignorance.

3.2.3 Exploratory analyses: Comparison of Study 1 and Study 2

To compare the results of Study 1 and 2, we ran additional Generalized Linear Mixed-effects Models analyses with binomial distribution and a logit link function which were not preregistered. The response variable was a binomial measure of the target's language (Turkish vs. Batris). The full model included the predictors Condition (targets' knowledge vs. targets' ignorance), Age (7 vs. 8), Familiarity (familiar vs. unfamiliar), Knowledge Type (cultural vs. general), possible interactions between these variables and the random intercepts of participant ID and items. We tested the significance of the full model by comparing its fit with a null model lacking Condition, Age, Familiarity, Knowledge Type and their interactions. The full model improved the fit ($\chi2(14) = 534.72$, $p < .001$). When interactions' contributions to the model were investigated, results revealed that the interaction between Condition and Familiarity ($\chi2(1) = 385.26$, $p < .001$), Condition, Age and Familiarity ($\chi2(1) = 14.47$, $p < .001$), and Condition, Familiarity and Knowledge Type ($\chi2(1) = 59.13$, $p < .001$) were significant, so they were kept in the model. Results also indicated that there were main effects of Condition ($\chi2(1) = 64.87$, $p < .001$) and Familiarity ($\chi2(1) = 5.30$, $p = .021$). Thus, participants were more likely to expect knowledgeable targets to speak Turkish than ignorant targets (*Estimate* = 1.42, *SE* = .16, $p < .001$) and they expected the targets to be more likely to speak Turkish for familiar item trials than unfamiliar item trials (*Estimate* = .43, *SE* = .18, $p = .014$).

We further investigated the interaction between Condition and Familiarity with pairwise comparisons adjusted by tukey. The results indicated that participants' responses differed depending on whether targets were knowledgeable or ignorant about familiar items (*Estimate* = 3.79, *SE* = .24, $p < .001$), and unfamiliar items (*Estimate* = -.96, *SE* = .18, $p < .001$). Targets who were knowledgeable about familiar items were expected to speak Turkish, whereas targets who were ignorant of familiar items were expected to speak Batris. Further, targets who were knowledgeable about unfamiliar items were expected to speak Batris, whereas targets who were ignorant of unfamiliar items were expected to speak Turkish. Additionally, familiar items yielded more robust responses in general: Although the same trend was observed in both conditions, participants' responses differed when targets were knowledgeable of familiar items and when they were ignorant of unfamiliar items (*Estimate* = 1.85, *SE* = .24, $p < .001$). Children expected targets who were knowledgeable of familiar items and targets who were ignorant of unfamiliar items to speak Turkish, however, this trend was more robust in the Knowledge compared to the Ignorance condition. Similarly, children's choices differed when they relied on targets' ignorance of familiar items versus then they relied on targets' knowledge of unfamiliar items (*Estimate* = -.98, *SE* = .23, $p < .001$). Thus, targets were expected to speak Batris in both conditions, but participants' choices were more robust when the targets were ignorant of familiar knowledge items (see Figure 5).

When Condition, Age and Familiarity interaction was examined, pairwise comparisons adjusted by tukey revealed that, in general, 7- and 8-year-olds responses did not differ (all $p_s > .05$). Both 7 and 8-year-olds' choices differed in knowledge and ignorance conditions for both trials with familiar as well as unfamiliar items (all

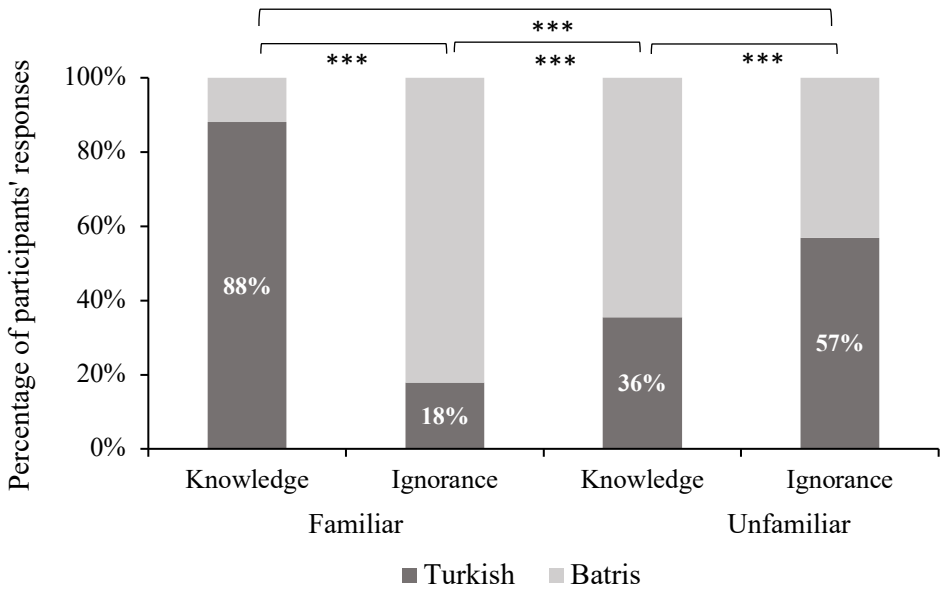


Figure 5. Comparison of Study 1 and Study 2
Note: The percentages of children's language choices based on condition (targets' knowledge vs. ignorance) and item familiarity.

p_s < .001), with the exception of 7-year-olds' responses across targets' knowledge and ignorance of unfamiliar items (*Estimate* = -.44, *SE* = .21, p = .45). Similarly, both age groups distinguished others' knowledge of familiar items from knowledge of unfamiliar items, and others' ignorance of familiar items from ignorance of unfamiliar items when making social inferences about them (all p_s < .001). Finally, both 7- and 8-year-olds expected targets who were knowledgeable of familiar items and the targets who were ignorant of unfamiliar items to speak Turkish, however, participants' responses were more robust in the former condition. Similarly, both age groups expected targets who were knowledgeable of unfamiliar items and targets who were ignorant of familiar items to speak Batris, however, children's Batris responses were more robust when targets were ignorant about familiar items (all p_s < .05) (see Figure 6).

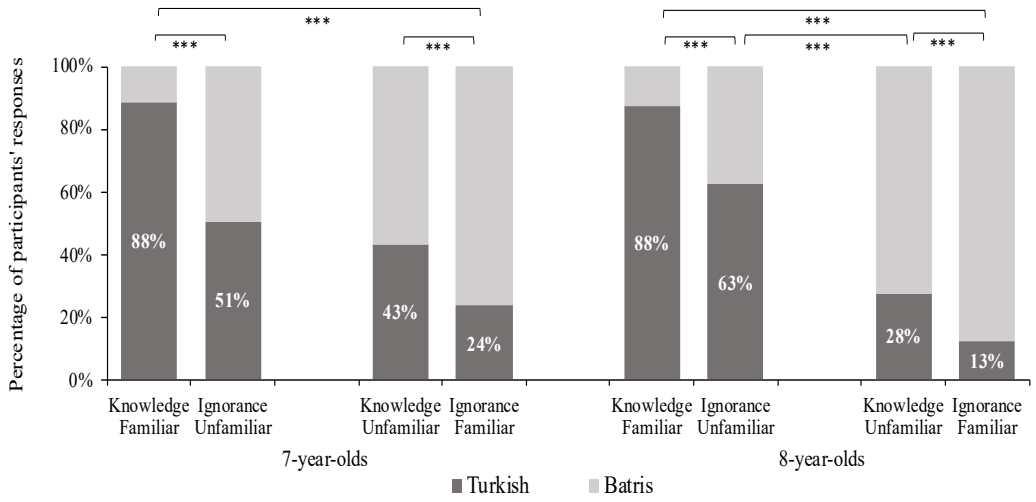


Figure 6. Comparison of Study 1 and Study 2
Note: Participants' responses depending on condition (targets' knowledge vs. ignorance), age and item familiarity.

Condition, Familiarity and Knowledge Type interaction was also further investigated with follow up analyses. Results indicated that participants distinguished targets' knowledge and ignorance and adjusted their social identity judgments based on the familiarity of the items and the type of knowledge. The only exception was that children's responses were similar across knowledge and ignorance conditions for trials involving unfamiliar general knowledge items (*Estimate* = .09, *SE* = .21, p = .99). The results also showed that familiar items yielded more robust choices and this trend held for both culture-specific and general knowledge items. That is, regardless of the type of the knowledge (culture-specific vs. general), children expected targets to speak Turkish more robustly in trials where the targets were knowledgeable about familiar items compared to when they were ignorant of unfamiliar items, and similarly, children expected targets to speak Batris more robustly for trials where the targets were ignorant of familiar items compared to when they were knowledgeable of unfamiliar items (all $p_s < .001$) (see Figure 7).

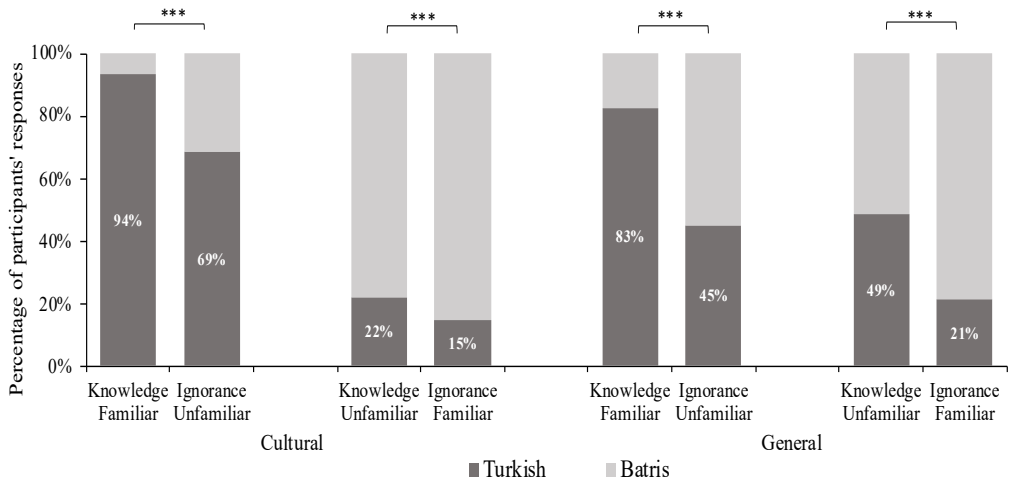


Figure 7. Comparison of Study 1 and Study 2
Note: The proportion of participants' language choices based on condition (targets' knowledge vs. ignorance), item familiarity and knowledge type.

With additional analyses, we examined whether Condition, Age, Familiarity and Knowledge Type would predict participants' *expected responses* for each condition. For this, participants' language choices (Turkish vs. Batris) were coded as "Expected vs. Not expected" based on our predictions about participants' responses in each condition: Responses of "Turkish" were coded as "Expected" and responses of "Batris" were coded as "Not expected" for trials in which participants and the targets shared a state of knowledge (i.e., when both were knowledgeable or ignorant of the items). For other trials, where the target and participants did not have a shared state of knowledge, coding was reversed: Responses of "Turkish" were coded as "Unexpected" and responses of "Batris" were coded as "Expected". The predictors, interactions and random intercepts in the null and full models were identical to the above analysis that contrasted Study 1 and Study 2. We tested the significance of the full model by comparing its fit with a null model lacking Condition, Age, Familiarity, Knowledge Type and their interactions. The full model improved the fit ($\chi 2(14) = 50.54$, $p < .001$).

Results indicated that there were main effects of Condition ($\chi 2(1) = 3.89$, $p = .049$), Age ($\chi 2(1) = 9.06$, $p < .01$), Familiarity ($\chi 2(1) = 23.15$, $p < .001$) and Knowledge Type ($\chi 2(1) = 14.67$, $p < .001$) (see Figure 8). That is, children were more likely to choose expected language in the knowledge compared to the ignorance condition (*Estimate* = .33, *SE* = .17, $p = .046$), when the items were familiar compared to unfamiliar (*Estimate* = 1.47, *SE* = .21, $p < .001$) and when knowledge items were culture-specific compared to general (*Estimate* = 1.00, *SE* = .21, $p < .001$). Further, 8-year-olds produced more expected responses compared to 7-year-olds (*Estimate* = -.51, *SE* = .17, $p < .01$). Results yielded no significant interactions.

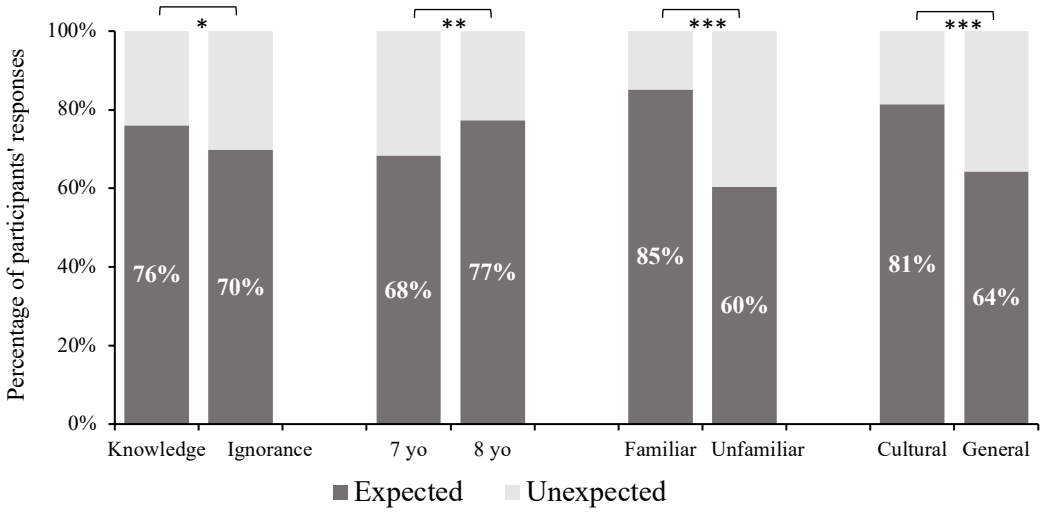


Figure 8. Comparison of Study 1 and Study 2
Note: The proportion of children's expected language responses depending on condition (targets' knowledge vs. ignorance), age, item familiarity and knowledge type.

Thus, overall, others' knowledge yielded stronger expected responses about these individuals' social identity than their ignorance. Similarly, children's social inferences were more robust when they were familiar with the knowledge items and when the knowledge items were culture-specific. Finally, 8-year-olds made stronger

inferences about others' social identities based on their knowledge states compared to 7-year-olds.

CHAPTER 4

GENERAL DISCUSSION

Previous studies indicate a link between shared knowledge and cultural groups. Adults and children pay attention to knowledge of others to make inferences about social history, affiliation, and group membership of these individuals (e.g., Soley & Köseler, 2021; Soley & Spelke, 2016; Velez et al., 2019). Moreover, children distinguish different types of knowledge in these inferences and associate shared cultural knowledge more strongly with shared social attributes, compared to knowledge that is widely shared (Soley, 2019; Soley &Aldan, 2020; Soley & Köseler, 2021). Based on these findings, the present research aimed to further investigate children's social attributions using others' knowledge and ignorance of cultural and general items. Specifically, children were shown targets, who were knowledgeable (Study 1) or ignorant (Study 2) of familiar and unfamiliar cultural and general knowledge items and asked whether targets would speak Turkish or Batris.

The results of Study 1 reveal that children make social identity judgments based on others' knowledge and children's own knowledge state plays an important role in these inferences. Specifically, 7 and 8 years-old children expect that if targets share their knowledge, these individuals would speak their native language. However, when targets are knowledgeable about unfamiliar items, children infer that targets would speak a foreign language. Results also suggest that children distinguish between cultural and general knowledge and make more robust language attributions when targets are knowledgeable of cultural items than general items. That is, in their

diagnostic inferences based on others' knowledge, children prioritize cultural knowledge when compared to general knowledge.

Study 1's findings highlight that, regardless of their own knowledge state, 7-year-olds had a tendency to attribute being a native speaker when the individuals are knowledgeable. Thus, 7-year-olds were more likely to make in-group membership inferences based on targets' knowledgeability, even when the targets were knowledgeable about unfamiliar items. In contrast, 8-year-olds used their own knowledge state in a more nuanced way when they made group membership inferences based on others' knowledge and produced expected responses more than 7-year-olds' about targets' language. These are in line with Soley and Köseler's (2021) findings, showing that 8-year-olds differentiate between cultural and general knowledge items more robustly compared to 7-year-olds.

Although different forms of culture-specific knowledge were used in the present research and the presentation of knowledge items to the children was mainly through relevant visuals instead of verbal expression, the findings of Study 1 were mainly parallel to Soley and Köseler (2021). Specifically, children used others' knowledge to make attributions about the language they speak, and they were more likely to make in-group membership inferences if targets were knowledgeable of cultural knowledge items compared to general knowledge items. Soley and Köseler (2021) found that with a few exceptions, children selectively used cultural knowledge, and not general knowledge when they made social inferences about others. This might be due to the differences in the knowledge items used in two studies, and some general knowledge items being more informative about the social group membership than others. Indeed, Soley and Köseler (2021) also found that some general knowledge items, such as knowledge of moral norms, were used as a

cue to being an ingroup member, but they were still less robustly used compared to their culture-specific counterparts, such as knowledge of conventional norms.

The results of Study 2 suggest that, like possession of it, lack of knowledge is also informative in children's social identity inferences about others. Again, children's own knowledge state has a role in these inferences. When children share targets' ignorance about unfamiliar items, they expect these individuals to speak their native language. However, when targets are ignorant of familiar items, children make out-group membership inferences and expect targets to speak a foreign language. Results also reveal that, both age groups are capable of distinguishing culture-specific and general knowledge, and once again, children prioritize cultural knowledge over general knowledge when they make language attributions about others who are ignorant.

As mentioned earlier, possession of knowledge might be a stronger social cue compared to lack of knowledge since having particular knowledge provides more information about someone's cultural background (Clark, 1996; Clark et al., 1983; Soley & Köseler, 2021; Velez et al., 2019). On the other hand, a person's ignorance of particular knowledge might only signals that the person is less likely to be a member of a particular group. That is, ignorance of others includes more alternative explanations and it becomes more difficult to make social judgments about these individuals. In line with this idea, when the role of others' knowledge and ignorance in children's social inferences are compared in the present research, children were found to show tendency to produce more robust responses when targets are knowledgeable than when they are ignorant.

It is worth to mention that, since others' ignorance has a potential of many alternative explanations, older children are more sensitive than younger ones in their

inferences in specific conditions. For instance, 7-year-old children's foreign language attributions are not as strong as 8-year-olds' attributions, when targets are ignorant about something they knew. Similarly, when targets are knowledgeable, younger children make more robust in-group membership inferences regardless of the type of knowledge. That is, younger children might have a developing sensitivity to assess different knowledge states of others and of themselves and associate them with their social identity inferences.

This change in the responses of children from 7 to 8 years old might be related to different factors. Children interact with an increasing number of individuals through schooling and the relatively greater social experience of 8-year-olds may have helped their more nuanced inferences about others' social identities based on these individuals' different knowledge states. Understanding school culture and complex social interactions among peer groups might also be beneficial for children's ToM achievements. Since these achievements continue to progress through middle childhood (Devine & Hughes, 2013; Peterson & Wellman, 2018), 8-year-olds might have made more sensitive social inferences when these inferences required evaluating others' knowledge states. Similarly, older children's increased skills for memory or executive functions (Davidson, Amso, Anderson, & Diamond, 2006) may have helped them in evaluating different states of knowledge and complex nature of ignorance, therefore, they may have generated more nuanced responses.

The present research reveals that different knowledge states between the targets and the children is used as a cue for belonging to a different social group. Specifically, children expect those who know unfamiliar items and those who do not know familiar items to speak a foreign language. These findings point that children

do not readily associate others' ignorance with their out-group membership. Instead, they evaluate their own knowledge state and infer out-group membership in only asymmetric knowledge conditions. These findings are in line with past research showing that children have a tendency to associate ignorance with unfamiliar others or non-native speakers when these individuals are ignorant of objects which are highly familiar to children (Corriveau & Harris, 2009; Corriveau, Kinzler, & Harris, 2013).

Soley and Spelke (2016) argued that since cultural knowledge that is not shared might be linked to different backgrounds or being an outgroup, children might avoid social affiliation with the individuals who know unfamiliar culture-specific knowledge, such as unfamiliar songs. In line with these arguments, current findings reveal that both age groups make these social identity judgments regardless of the type of knowledge, however these judgments were stronger when inferences were based on cultural compared to general knowledge.

Children's sensitivity to ignorance of culture-specific items, similar to their sensitivity to knowledge of them, might be related to cultural knowledge's privileged position. Cultural knowledge acquisition requires social interaction among group members (Legare & Harris, 2016; Pagel & Mace, 2004) and the possession of culture-specific knowledge might imply group boundaries more strongly. Several findings in the literature highlight that children use culture-specific knowledge selectively in their predictive and diagnostic social inferences (e.g., Liberman et al., 2020; Soley, 2019; Soley & Köseler, 2021). Overall, the findings of both Study 1 and Study 2 strengthen this privileged position of cultural knowledge in children's social judgments. However, in Study 2, children inferred that targets would speak a foreign language regardless of the type of the knowledge when these individuals were

ignorant about familiar items. This finding might be related to the complex nature of ignorance-based social inferences for children. As mentioned earlier, someone's knowledge of a particular subject is a powerful cue to understand that person's social background (Clark, 1996; Clark et al., 1983; Soley & Köseler, 2021; Velez et al., 2019). However, someone's ignorance about the same subject might require children to consider many different alternatives, making it cognitively more demanding. Therefore, children may have difficulty distinguishing cultural and general knowledge when others are ignorant. Having said this, in Study 2, children still had stronger inferences about targets' group membership when they were ignorant of unfamiliar cultural items compared to when they were ignorant about unfamiliar general items.

In the present research, children made native language speaking inferences about others who shared their own ignorance about unfamiliar items. This finding was also in line with Soley and Spelke's (2016) findings that children prefer others who do not know the songs which they themselves are ignorant of. Thus, similar to shared knowledge, shared ignorance among targets and children might be associated with similar backgrounds or social history, thus, belonging to the same social group. Overall results also suggests that children adjust their social judgments based on their own knowledge and ignorance, and children's familiarity with the items has an impact on robustness of expected responses. Specifically, regardless of targets' knowledge or ignorance, children's responses were more robust in trials including familiar items compared to trials including unfamiliar items. In line with this, in asymmetric knowledge conditions, children's expected responses, such as attributing outgroup membership in asymmetric knowledge conditions when targets were knowledgeable of unfamiliar items or ignorant of familiar items, were more robust

when targets were ignorant of familiar items. Additionally, children made more robust inferences about targets' language in shared knowledge conditions when targets were knowledgeable of familiar items than shared ignorance conditions when targets were ignorant of unfamiliar items. Taken together, robustness impact of targets' knowledge and children's familiarity with the items point the importance of possession of knowledge compared to lack of knowledge in social inferences. Children produce more robust responses when they are knowledgeable or when others are knowledgeable. That is, although they also use ignorance of others or ignorance of themselves while making social inferences, having knowledge has a privileged position as a cue in these inferences compared to ignorance.

It is important to note, again, that the current studies used visuals to represent different knowledge items. Children were shown highly familiar images for both familiar and unfamiliar general knowledge, and familiar cultural items, such as the image of sun, a kitten or Turkish tea. However, unfamiliar culture-specific images belonged to an unfamiliar culture, such as a foreign food or a pink drink, and children most probably saw these items for the first time in their life. Although the images were still about a familiar domain like a national flag, food in a plate, or drink pouring from a jug to a glass, and participant children did not express any confusion about understanding that particular domain in the experiments, the highlighted unfamiliarity of culture-specific images might have influenced children's judgments. If this asymmetry in visuals have influenced children's responses, the difference of children's responses between cultural and general knowledge trials with familiar images should have differed from the difference between cultural and general knowledge trials with unfamiliar images. However, when the results of Study 1 and Study 2 were further investigated, the differences were similar. That is, the

possible asymmetry in the familiarity of images did not make any difference in children's responses. Further, we believe that the pattern of results in the current studies are unlikely to be driven by these visuals, given that they closely parallel previous research that used no visuals at all (Soley & Köseler, 2021).

The results of current research suggest that ignorance of others plays a role in children's group membership inferences, however children's social affiliation preferences based on others' ignorance are not clear. Previous research shows that children avoid being friends with others who are knowledgeable of unfamiliar songs about which they are ignorant and prefer to socially affiliate with others who are knowledgeable of the same songs as themselves (Soley & Spelke, 2016). In real world, children interact with ignorant others as well as knowledgeable others. Therefore, future research might investigate children's social affiliation preferences based on others' ignorance about different forms of knowledge, such as different cultural and general knowledge items. These studies might allow us to compare the role of others' ignorance in children's group membership inferences and their social preferences as well as the role of cultural and general knowledge in these.

Findings of the present research might have implications for interventions which aim to reduce negative inter-group perceptions and behaviors. Since children have limited control over their social environment, interventions to reduce prejudice indirectly, such as imagining a contact with an out-group member, gain importance (Dovidio, Eller, & Hewstone, 2011). For instance, a recent study suggests that imagining contact with out-group members, such as disabled or Black children, reliably reduce prejudices in 4- to -6-years old children (Birtel et al., 2019). Previous studies also reveal that interventions involving learning other groups' culture-specific knowledge, such as songs, or even imagining sharing cultural knowledge-based

activities, such as games, improves children's implicit and explicit intergroup attitudes (Neto, Pinto, & Mullet, 2019; Vezzali, Capozza, Giovannini, & Stathi, 2011). Therefore, addition to present research's findings about children's group membership inferences based on others' knowledge states, further understanding of children's social preferences in different contexts, such as when they share ignorance with others about unfamiliar culture-specific knowledge, might be a useful contribution to efforts to reduce prejudices towards out-group members.

The present research focused targets' current knowledge states, such as "This child knows / does not know X", and children made in-group inferences when others shared their knowledge state. As argued earlier, one possible explanation for these findings might be children's evaluations of shared social background based on shared knowledge state. However, the mechanism behind this evaluation process is not clear. When making social inferences, children might focus only others' current knowledge state to decide whether these individuals have a similar social history with themselves, or, if possible, they might take into consideration more information about others' knowledge or ignorance, like past and current states together. Children understand that knowledge has a changeable nature, that is, it may grow or fade out over time. For instance, they might be more knowledgeable when they grow up or forget things which they know currently (Atance & Caza, 2018; Fitneva, 2020). So, an interesting future direction may be investigating whether children consider how long someone has known a particular piece of culture-specific knowledge, or whether they distinguish current and past knowledge states when making social attributions about individuals. Specifically, targets may be individuals who knew something in the past but forgot it, or who did not know something in the past but are currently knowledgeable about it. Similarly, targets might differ in terms of how long

they have known a particular cultural knowledge. This may show similarities to the real world, for example, immigrant children learning a new culture. Previous research suggests that children and adults make different social judgments when targets knew (but did not like) something and when targets had just learned (and liked) something (Soley, 2019; Soley & Aldan, 2020, Velez et al., 2019). In line with these findings, children might adjust their group membership inferences based on others' past knowledge state, and expect individuals, who are currently knowledgeable but were ignorant in the past, to be out-group members. In contrast, children may also focus on the current knowledge state of others regardless of their past knowledge. Examining children's differentiation of others' past and current knowledge states in their social inferences might further contribute to our understanding of knowledge's social implications.

In real world, children have various social cues about other individuals and knowledge has been an important one. However, for children, there are different knowledge states of others and of themselves. That is, they do not only have interactions with others who are knowledgeable, they also contact individuals who are ignorant of different types of knowledge. The findings of present research suggested that, even with minimal information, children reliably distinguished someone's knowledge from ignorance and made diagnostic inferences about others' social identity based on others' knowledge as well as ignorance. Moreover, although older children's responses were more robust, children selectively adjusted their judgments about other persons based on their own knowledge state, and crucially, they differentiated the type of knowledge in their social inferences. These findings indicate that children's social inferences were in line with our expectations based on

previous research and that others' ignorance, as well as their knowledge, are important social cues for children.

APPENDIX A

ETHICS COMMITTEE APPROVAL

Evrak Tarih ve Sayısı: 01.11.2021-36418

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER YÜKSEK LİSANS VE DOKTORA TEZLERİ ETİK İNCELEME KOMİSYONU
TOPLANTI KARAR TUTANAĞI

Toplantı Sayısı	:	22
Toplantı Tarihi	:	13.10.2021
Toplantı Saati	:	14:00
Toplantı Yeri	:	Zoom Sanal Toplantı
Bulunanlar	:	Prof. Dr. Ebru Kaya, Prof. Dr. Fatma Nevra Seggie, Dr. Öğr. Üyesi Yasemin Sohtorik İlkmen
Bulunmayanlar	:	

Güneş Öner
Psikoloji Bölümü

Sayın Araştırmacı,
"Bilgi Eksikliğine Dayalı Sosyal Kimlik Çıkarımları: Gelişimsel Bir Çalışma" başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2021/57 sayılı başvuru komisyonumuz tarafından 13 Ekim 2021 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya çevrimiçi olarak katılımı ve oybirliği ile alınmıştır. COVID-19 önlemleri kapsamında kurul üyelerinden ıslak imza alınamadığı için bu onay mektubu üye ve raportör olarak Fatma Nevra Seggie tarafından bütün üyeler adına e-imzalanmıştır.

Saygılarımızla, bilgilerinizi rica ederiz.

Prof. Dr. Fatma Nevra SEGGIE
ÜYE

e-imzalıdır
Prof. Dr.Fatma Nevra SEGGIE
Raportör

SOBETİK 22 13.10.2021

APPENDIX B

EXAMPLES FOR EACH KNOWLEDGE ITEM

1. Culture-specific knowledge items

Food (familiar)

Drink (familiar)

Musical instrument (familiar)

National flag (familiar)

Food (unfamiliar)

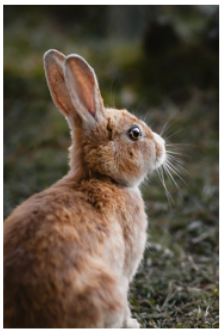
Drink (unfamiliar)

Musical instrument (unfamiliar)

National flag (unfamiliar)

2. General knowledge items

Favorite food of rabbits (familiar)



Shape of earth (familiar)

Place of heart in human body (familiar)

Food made by bees (familiar)

Average hours cats sleep in a day (unfamiliar)

Earth's distance from the sun (unfamiliar)

Average number of times a person blinks in a minute (unfamiliar)

Total number of butterfly species (unfamiliar)

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