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Does the age and Familiarity of the Informant Group Influence the Tendency of 3- and 4-year-old Children to Conform?

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Influence of informant age and familiarity on conformity

1 The aim of the current study was to explore whether the age and the familiarity of the
2 individuals comprising a group majority influenced the tendency of 3- and 4-year-old
3 children to conform. Participants were presented with two variants of a novel task in
4 which they were required to judge which of three line drawn tigers had the greatest
5 number of stripes. The participants made their judgements in two contexts, first after
6 viewing five informants perform the task incorrectly, and second without viewing the
7 responses of other individuals. The informants comprised either a group of familiar
8 children, a group of unfamiliar children, a group of familiar adults, or a group of
9 unfamiliar adults. The results showed that the children displayed selective conformity
10 with respect to informant age, readily adopting the incorrect response when it was
11 indicated by an adult majority, but failing to do so when the same incorrect response
12 was indicated by a majority of children. In contrast the familiarity of the individuals
13 comprising the majority had little influence on the tendency of children to conform.
14 These results suggest that children are not blanket conformists, rather they respond
15 selectively depending on characteristics of the individuals comprising the group
16 majority.

17

18 Conformity; informant familiarity; informant age; majority influence

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25 Conformity - here defined as the tendency of an individual to display the most
26 frequent behavior performed by others (Claidière & Whiten, 2012) - is a topic that has
27 generated substantial interest since the seminal studies of Asch (1955). In these early
28 studies Asch demonstrated that adult participants could often be led to make incorrect
29 judgements on straightforward perceptual tasks if they were first exposed to the
30 'incorrect' judgements made by a series of confederates. Subsequent studies that have
31 employed age appropriate variants of the Asch paradigm, have shown that conformity
32 is not restricted to adulthood and frequently occurs in both adolescent and school aged
33 children (Berndt, 1979; Bishop & Beckman, 1971; Costanzo & Shaw, 1966).
34 However, despite knowing much about conformity in late childhood and adulthood
35 we still know relatively little as to when, and how, this conformist tendency develops
36 in early childhood. The current study aimed to enhance our knowledge of conformity
37 in the preschool period by: 1) extending the study of conformity to the new
38 unexplored domain of number judgement, before asking for the first time, 2) whether
39 the tendency of preschool children to conform is influenced by characteristics of the
40 informants (age and familiarity) comprising the group majority.

41 Within the existing literature it has been shown that preschool children often
42 display conformity in a variety of different domains, including verbal testimony (e.g.,
43 Chen, Corriveau, & Harris, 2012; Corriveau, Fusaro, & Harris, 2009; Seston &
44 Kelemen, 2013), action copying (e.g., Haun, Rekers, & Tomasello, 2012; Herrmann,
45 Legare, Harris, & Whitehouse, 2013; Hu, Buchsbaum, Griffiths, & Xu, 2013;
46 McGuigan & Robertson, 2015; Wilks, Collier-Baker & Nielsen, 2015), and visual
47 perception (Corriveau & Harris, 2010). Irrespective of the specific task domain being
48 tested conformity is typically assessed by exposing children to a task in which there
49 are two or more alternative ways to respond (e.g., adopt label A or label B; copy

50 action A or action B; select short line or long line). In order to create the group
51 majority necessary to elicit conformist behavior one of the responses is performed by
52 all, or most, of a group of informants, with a minority comprising a single individual
53 who performs a different response to the majority. Alternatively, a group majority has
54 been created by an individual endorsing the behavior of one of the initial informants,
55 through for example nodding their head in agreement as that informant labels an
56 object (Fusaro & Harris, 2008; 2013). Despite variation in both the way in which the
57 group majority was constructed, and the specific task domain being tested, the
58 majority of studies have shown that a substantial number of 2- to 5-year-old children
59 preferentially adopt the response displayed by the group majority.

60 The extent to which preschool children display conformist behavior does
61 however vary markedly across studies. For example in a modification of the Asch
62 paradigm Walker and Andrade (1996) found conformist behavior in 85% of their 3- to
63 5-year-old sample, whereas only 33% of children in the same age range conformed to
64 the tool choice made by a group of adult informants (DiYanni, Corriveau, Kurkul,
65 Nasrini, & Nini, 2015). There are many sources of variation that may explain the
66 different levels of conformity witnessed across these studies. One source of variation
67 lies in the characteristics of the individuals comprising the informant group, including
68 the level of informant familiarity (i.e., informants are known or unknown to the
69 participant), and informant age (adult informants or child informants). Within the
70 existing literature it is difficult to determine whether informant familiarity, and
71 informant age, have distinct influences on conformity as previous studies have
72 confounded these two characteristics by employing either unfamiliar adult informants
73 (e.g., Chen et al., 2012; Corriveau et al., 2009; DiYanni et al., 2015; Hu et al., 2013),
74 or familiar child informants (Haun et al., 2012; Haun & Tomasello, 2011; McGuigan

75 & Robertson, 2015; Walker & Andrade, 1996). In addition to substantial variation in
76 the characteristics of the informant group, previous studies have tested conformity
77 using a variety of different tasks, each of which varies in the nature of the response
78 required (e.g., make an accurate perceptual judgement; select an affordant tool)
79 making direct cross study comparisons extremely difficult. Therefore in order to
80 elucidate our understanding of the factors that influence conformity the current study
81 aimed to systemically vary both the age and familiarity of the informant group whilst
82 holding the task domain constant.

83 Insight into the influence that different informant characteristics may have on
84 conformity can potentially be gained by examining the results from a series of recent
85 studies (which we call here for ease of reference ‘selective trust studies’), that have
86 directly manipulated the characteristics (e.g., age, familiarity, expertise etc.) of single
87 informants. With respect to informant familiarity previous ‘selective trust’ studies
88 have shown that children are more likely to trust the verbal testimony provided by a
89 familiar adult than an unfamiliar adult, unless given reason to doubt the information
90 provided by the familiar individual (Corriveau & Harris, 2009). The influence of
91 informant familiarity has been shown to be more variable within the domain of action
92 copying, with some studies indicating that children are as likely to copy the actions
93 performed by familiar adults as they are unfamiliar adults (Nielsen & Tomaselli,
94 2010; Stenberg, 2013), and others showing a preference towards copying adults who
95 are familiar (Learmonth, Lamberth, & Rovee-Collier, 2005). Further studies paint a
96 yet more complex picture in which informant familiarity leads to different levels of
97 copying fidelity depending on informant status and the location (lab or home
98 environment) in which the actions are performed (McGuigan, 2013; Seehagen &
99 Herbert, 2012).

100 As well as exploring the influence that informant familiarity has on children's
101 behavior studies from the selective trust literature have also detailed the influence of
102 informant age in a variety of different domains. Within the domain of verbal
103 testimony children have been shown to correctly attribute knowledge likely to be
104 within the adult domain (e.g., knowledge about food) to adults, and knowledge likely
105 to be within the domain of children (e.g., knowledge about toys) to children (Fitneva,
106 2010; Jaswal & Neely, 2006; Taylor, Cartwright, & Bowden, 1991; Vanderborcht &
107 Jaswal, 2009). Similarly, when asked to choose between information provided by a
108 child informant and an adult informant, preschool children more frequently trust the
109 information provided by the adult informant, so long as both the child and adult
110 informants were reliable (Jaswal & Neely, 2006). However, when the reliability of
111 each informant was varied, such that one informant provided correct information and
112 the other informant provided incorrect information, children more readily trusted the
113 reliable informant irrespective of whether they were an adult or a child (Boseovski,
114 2012; Jaswal & Neely, 2006). More recent research, adds yet more complexity,
115 showing that the authority level of the adult informant strongly influences the level of
116 trust displayed in them (Chan & Tardiff, 2013). Thus it appears that the relationship
117 between informant age and trust is multifaceted, with many factors influencing the
118 tendency of children to trust the testimony of a particular informant.

119 The complex relationship between informant age and observer trust extends to
120 domains outside of the testimony literature. In the domain of action copying children
121 tend to copy the actions performed by adults, but not peers, when the actions are
122 inefficient (Flynn, 2008; McGuigan & Graham, 2010; McGuigan, Makinson, &
123 Whiten, 2011; Wood, Kendal, & Flynn, 2012), or unusual (Zmyj, Daum, Prinz, &
124 Aschersleben, 2012), whereas when the model's actions are familiar, peers are

125 preferentially copied (Ryalls, Gul, & Ryalls, 2000; Zmyj, Daum, Prinz, et al., 2012;
126 Zmyj, Daum, & Prinz, 2012). In addition to differences in the fidelity with which the
127 actions of adult and child informants are copied, it has recently been shown that the
128 level of copying fidelity following task demonstration by different adults can vary,
129 with the technique displayed by high status individuals being copied more readily
130 than the technique displayed by low status individuals, or strangers (McGuigan,
131 2014). As well as showing age based selectivity in the domains of verbal testimony
132 and action copying preschool children have also demonstrated similar selectivity
133 within the context of learning the rules of games, with children learning the rules of
134 games more readily from adults than peers (Rakoczy, Hamann, Warneken, &
135 Tomasello, 2010)

136 In sum those studies that have explored conformity in the preschool period
137 have shown that young children often adopt the behavior of a group majority,
138 comprised of either adults or peers, across a variety of different domains. In parallel to
139 the conformity studies another cluster of ‘selective trust’ studies have explored
140 children’s trust in single informants, showing that children respond selectively to
141 characteristics of different informants, including age and familiarity. The aim of the
142 current study was to integrate the findings from the conformity and selective trust
143 literatures by asking whether the selectivity seen at the level of single informants
144 extends to the context of a group majority. More specifically, whilst holding the task
145 domain constant (number judgement task), we asked whether 3- and 4-year-old
146 children always conform to a group majority irrespective of the identity of the
147 individuals comprising the majority, or whether the tendency to conform varies
148 according to the age and familiarity of the informants. It was predicted that the
149 children would display conformist behavior, but the extent to which they did so would

150 vary, with participants conforming most frequently after viewing a majority
151 comprised of familiar adults, and least frequently when the majority comprised
152 unfamiliar peers.

153

154 Method

155 *Participants.* A total of 40 children (26 boys and 14 girls) who were aged 3 and 4
156 years at the time of testing (mean = 48 months, range = 36-59 months, SD = 6
157 months) participated in the study. All children attended the same Kindergarten in the
158 North East of Scotland, UK.

159

160 *Design.* The participants were allocated to one of four conditions using a 2 (familiar
161 informants or unfamiliar informants) x 2 (child informants or adult informants)
162 between-participants design. In the first phase of the experiment, the ‘Majority
163 Phase’, participants in each of the four conditions viewed five different informants
164 perform the task incorrectly. The informants varied with respect to familiarity and age
165 with participants viewing either: five familiar children, five unfamiliar children, five
166 familiar adults or five unfamiliar adults. In a second ‘No-majority Phase’ participants
167 performed a near identical task in which they were allowed to respond without having
168 witnessed the choice made by other individuals (see Fig. 1 for an overview of the
169 experimental design).

170

171 ---Fig. 1 about here---

172

173 *Materials.* The stimuli presented to the participants in both phases of the experiment
174 comprised three line drawn tigers (positioned side by side) that varied only in color

175 and the number of stripes they possessed. In Phase 1 the tiger on the left hand side of
176 the display was orange with two stripes, the tiger in the middle was red with three
177 stripes, and the tiger on the right hand side was yellow with four stripes. In Phase 2
178 the tigers (from left to right) were purple with two stripes, green with three stripes and
179 blue with six stripes.

180 In order to present the participants with information from an incorrect majority
181 we created a series of still frames consisting of head shots of five familiar adults, five
182 familiar children, five unfamiliar adults, and five unfamiliar children. The familiar
183 informants were either classmates or teachers who the participants' knew from their
184 kindergarten class. The still frame of each face was followed by a second still frame
185 of an age appropriate hand pointing to the incorrect choice (the red tiger). The
186 photographs of the hands were taken from two of the children and two of the adults
187 who were photographed for the head shot. We included the hand shots from a small
188 number of individuals to maintain consistency across conditions, i.e., the same stills
189 of the informants hands could be presented in both the familiar and unfamiliar child
190 conditions, and both the familiar and unfamiliar adult conditions. In order to create the
191 illusion that each picture showed the hands of a different individual each model's
192 hands were photographed pointing to the incorrect tiger from a variety of different
193 angles to give the appearance of five different individuals making the selection. All
194 stills were presented in slideshow format on a laptop display.

195

196 *Procedure.* Phase 1: Exposure to an incorrect majority.

197 Children were tested individually at a table in a quiet room within their kindergarten.
198 Once the participant appeared comfortable the experimenter laid out the three tigers in
199 the same order as the child would view in the slideshow (L to R: orange tiger, red

200 tiger, and yellow tiger). It was explained to the participants that they would be asked
201 to 'pick the tiger that had the most stripes' but first they were going to see some
202 pictures showing five other people (either five familiar children; five unfamiliar
203 children; five familiar adults; or five unfamiliar adults) pointing to the tiger that they
204 thought had the most stripes. On completion of the slideshow the participants were
205 asked to select the tiger that they thought had the most stripes.

206

207 Phase 2: No majority exposure

208 In order to ensure that the children were picking the incorrect tiger as a result
209 of viewing the incorrect majority, rather than simply making an incorrect response,
210 the children were presented with a second near-identical task without viewing the
211 responses of other individuals. This allowed the participants to display their real
212 knowledge of the task free of the influence of others. On completion of the
213 experimental trial the participant was taken to a table in the opposite corner of the
214 room and shown three more tigers that varied in color and the number of stripes they
215 possessed (L to R: purple two stripes, green three stripes, blue six stripes). The
216 participant was once again asked to pick the tiger with the most stripes.

217

218 *Scoring.* In Phase 1 we recorded whether the participants displayed conformist
219 behavior by selecting the tiger chosen by the incorrect majority (selected the red
220 tiger), whether the participants ignored the information provided by the majority and
221 responded accurately (selected the yellow tiger), or whether they picked neither the
222 correct tiger nor the majority tiger (orange tiger). In Phase 2 we recorded whether or
223 not the children correctly selected the tiger with the most stripes (the blue tiger), or
224 whether they made an incorrect selection (either the purple tiger or the green tiger).

225

226 Results

227 Of the 40 participants who took part in the study 18 (45%) chose the incorrect (red)
228 tiger indicated by the group majority in Phase 1, with the remaining 22 participants
229 (55%) responding correctly by indicating the yellow tiger. No participant selected the
230 orange tiger in Phase 1. In contrast in Phase 2, where children responded without
231 having first viewed a majority response, only 3 participants (7.5%) failed to select the
232 correct tiger. As we could not be sure that the 3 children who failed Phase 2
233 understood the task, the data from these individuals was omitted from all subsequent
234 analyses, leaving a final sample of 37 participants. The gender of the participants was
235 also excluded from all further analyses as preliminary analyses revealed that there was
236 no effect of participant gender on conformist behavior in Phase 1.

237

238 *Influence of informant age and familiarity.* In order to determine whether the extent to
239 which the participants conformed was influenced by the familiarity and age of the
240 informants we compared the level of correct responding that occurred in Phase 1, to
241 the level of correct responding that occurred in Phase 2 in each of the four conditions.
242 Conformity was indicated by a significant decrease in correct responding in Phase 1
243 (as a result of the participants adopting the incorrect choice indicated by the majority)
244 relative to the level of correct responding witnessed in Phase 2. A series of Wilcoxon
245 tests performed on each of the four conditions revealed that the children performed
246 significantly fewer correct responses in Phase 1 than Phase 2 after viewing the
247 incorrect response indicated by the majority comprising familiar adults ($Z = -2$, N -ties
248 $= 5$, $p = .046$, two tailed; see Fig 2.) and the majority comprising unfamiliar adults (Z
249 $= -2.7$, N -ties $= 3$, $p = .008$, two tailed; see Fig 2). However, the participants

250 responded accurately in both Phase 1 and Phase 2 after viewing an incorrect majority
251 comprising children, irrespective of whether they were familiar or unfamiliar,
252 suggesting that same aged peers had little influence on the tendency to conform (see
253 Fig. 2).

254

255 ---Fig. 2 about here---

256

257 Discussion

258 The current study extended our knowledge of conformity in the preschool
259 period to the new, unexplored, domain of number judgement. Solutions to the task
260 were indicated by four different informant groups allowing us to provide, what is to
261 our knowledge, the first systematic exploration of the influence of the age and
262 familiarity of the group majority. Results showed that 3- and 4-year-old children often
263 conformed to the informants' incorrect judgements, but the extent to which they did
264 so varied according to the identity of the informants comprising the group majority.
265 The informant characteristic that had the greatest influence on conformity was
266 informant age, with only the adult majorities influencing the participants' behavior to
267 such an extent that they acted against their real world knowledge of the task and
268 responded incorrectly. In contrast informant familiarity had no influence on the
269 participants' responses with similar levels of conformity being witnessed after
270 exposure to both familiar and unfamiliar adults, and familiar and unfamiliar peers.
271 This pattern of performance suggests that preschool children do not blindly copy the
272 way in which a majority of respondents perform a task. Instead it appears as though
273 the tendency to conform can be applied selectively, and in the case of the current
274 study varies according to the age of the individuals comprising the group majority.

275 That the children so ‘blindly’ adopted the solution provided by the adult
276 informants is somewhat curious as the task was well within the capabilities of
277 preschool children, and contained an unambiguously correct solution (one tiger had
278 more stripes than the others). However, despite the apparent simplicity of the task the
279 fact that all five adult informants selected the same incorrect option may have led the
280 children to doubt their own knowledge of the task, and subsequently adopt the choice
281 made by the adults as they believed the adult choice to be the correct one. If the
282 participants were harbouring reservations that their own knowledge of the task was
283 inaccurate then we would have expected the participants to attempt to align their
284 responses on the second task to the response made by the adults in Phase 1. However,
285 no attempt to modify responding was witnessed in Phase 2 where the levels of correct
286 responding were very high. This suggests that the participants were not conforming to
287 the choice made by the adult informants as a result of a belief that their own
288 knowledge was somehow deficit and that the adult response was the correct one.

289 If the children did not believe that the option chosen by the adult informants
290 was the correct solution how can the high levels of conformity be explained? One
291 possibility is that the selection made by the children was influenced by the fact that
292 the group of adult informants appeared to be making the incorrect response
293 deliberately. Previous studies have shown that preschool children are highly skilled in
294 correctly attributing knowledge, and expertise, from different domains to
295 appropriately aged informants (Fitneva, 2010; Jaswal & Neely, 2006, Taylor et al.,
296 1991; Vanderborght & Jaswal, 2009). It therefore likely that the children would have
297 correctly ascribed adults with the ability to make accurate number judgements. The
298 awareness that adults are generally accurate when making number judgements would
299 have led to the incorrect performance of all five of adult informants appearing highly

300 unusual, and may have resulted in the children interpreting the incorrect responses as
301 intentional and therefore worth adopting (McGuigan, Whiten, Flynn, & Horner, 2007;
302 McGuigan, 2012). Indeed, the influence that unusual responses can have on children's
303 selective copying was highlighted in a recent review that concluded that adult
304 informants were more likely to be copied than peer informants when the response was
305 inefficient or unusual, whereas peers were more likely to be copied when familiar
306 actions were involved (Zmyj & Seehagen, 2013).

307 The unusual, and somewhat ambiguous, nature of the adults' actions in the
308 current study may have led the children to adopt a socially driven mode of learning,
309 where social information was prioritized over accurate information (DiYanni et al.,
310 2015). Within the context of the current task social information may have been more
311 heavily weighted as the adult consensus was interpreted as providing useful
312 information about a social convention. Conventional actions, like the current actions,
313 are typically performed without an apparent rationale, and are often those kinds of
314 actions that define different cultural behaviors (e.g., the way we dress and eat in
315 different societies). A suite of recent studies have shown that young children are more
316 likely to copy behaviors when conventional cues are present in a display, including
317 the number of informants displaying a particular action (e.g., Herrmann et al., 2013;
318 McGuigan & Roberston, 2015), and the nature of the language used (Moraru, Gomez
319 & McGuigan, 2016). In contrast the participants may have viewed the incorrect
320 performance of the child informants as less unusual than that of the adults, instead
321 attributing the incorrect responses of the children as resulting from a lack of expertise,
322 rather than displaying useful conventional behavior. In this instance the participants
323 engaged in a perceptually driven mode of learning, and subsequently responded
324 accurately, rather than conforming, in the child informant conditions.

325 Future studies should detail the circumstances under which children will
326 engage in either a perceptually driven or a socially driven mode of learning. The
327 current results suggest that a key factor in determining which learning mode children
328 will adopt is the ability of children to provide a rationale for the incorrect response
329 provided by the informant group. If children can attribute a rationale for the incorrect
330 choice (e.g., a lack of expertise) then children ignore the consensus information and
331 engage in a perceptually driven mode of learning. If however a rationale cannot be
332 found (e.g., a group of expert adults make unusual choices) then children ignore the
333 perceptual information and engage in a socially driven mode of learning. Another
334 factor that may influence which learning mode children engage with is whether the
335 adopting the incorrect behavior of the group impacts on the ability to complete the
336 task successfully. In the current task adopting the approach of the incorrect adult
337 majority was cost free, and did not impact on the children's ability to complete the
338 task, and the levels of conformity were high. In contrast in DiYanni et al. (2015)
339 adopting the response of the majority (select an inefficient tool) would have impacted
340 on the children's ability to complete the task (crush cookies) successfully, and
341 conformity was low.

342 In conclusion it appears that children in the preschool period do not display
343 conformist behavior on every occasion where they view a majority of individuals
344 performing a particular response. Instead, children have the capacity to act selectively,
345 basing their decision to conform on characteristics of the individuals comprising the
346 informant group. The complex interplay between the tendency to conform and
347 characteristics of the group majority may also be influenced by the nature of the task
348 response (ambiguous or unambiguous), and the context in which the task is presented
349 (e.g., conventional or instrumental). This selective approach to conformity may be a

350 product of evolved transmission biases, a set of biases that allow observers to
351 maximize social learning in an environment in which a variety of task variants and
352 models are available (Boyd & Richerson, 2009). When approaching a task for the first
353 time a useful strategy for a naïve individual is to copy the approach to the task that is
354 displayed most frequently by individuals in the surrounding environment, as it is
355 likely that the most frequent approach is a successful one. This ‘conformist bias’ takes
356 away the need for trial and error learning, which is potentially ineffective and time
357 consuming, and instead provides a powerful, and quick, way to socially learn both the
358 conventions and instrumental actions necessary to function successfully in social
359 groups. If however the capacity to adopt the majority approach interacts with a
360 capacity to learn selectively from different informants-‘model-based bias’-, then
361 children will be able to selectively prioritize the information provided by certain
362 groups of individuals (e.g., experts), providing children with a powerful set of tools
363 with which to learn from the individuals surrounding them. Intriguingly it appears as
364 though these biases are evident in children as young as three years of age, with
365 children moderating their behavior depending on the identity of the group majority
366 within the context of environmental uncertainty.

367

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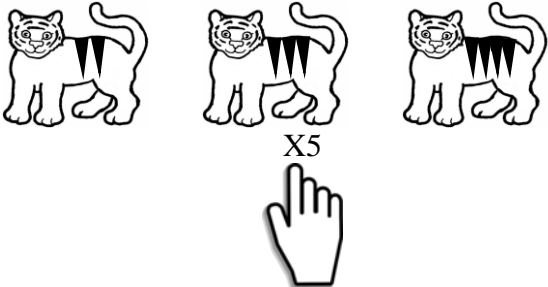
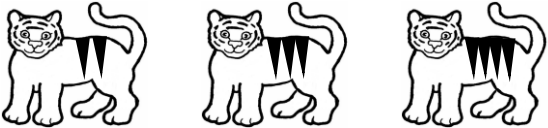
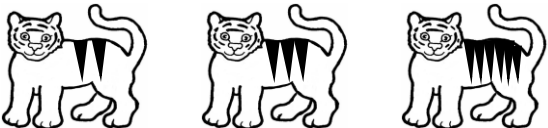
<u>Phase</u>	<u>Prior information</u>	<u>Which tiger has the most stripes?</u>
Phase 1: Majority		
Phase 2: No-majority	No prior information	

Figure 1. The upper panel shows the stimuli used in Phase 1, and the lower panel the stimuli used in Phase 2. In the prior information stage of Phase 1 the children saw 5 informants point to the middle ‘incorrect’ tiger before being asked to judge which of the same three tigers (2 stripes, 3 stripes and 4 stripes) has the most stripes. In Phase 2 children received no prior information before being asked to judge which of three tigers (2 stripes, 3 strips and 6 stripes), different to those used in Phase 1, has the most stripes.

Influence of informant age and familiarity on conformity

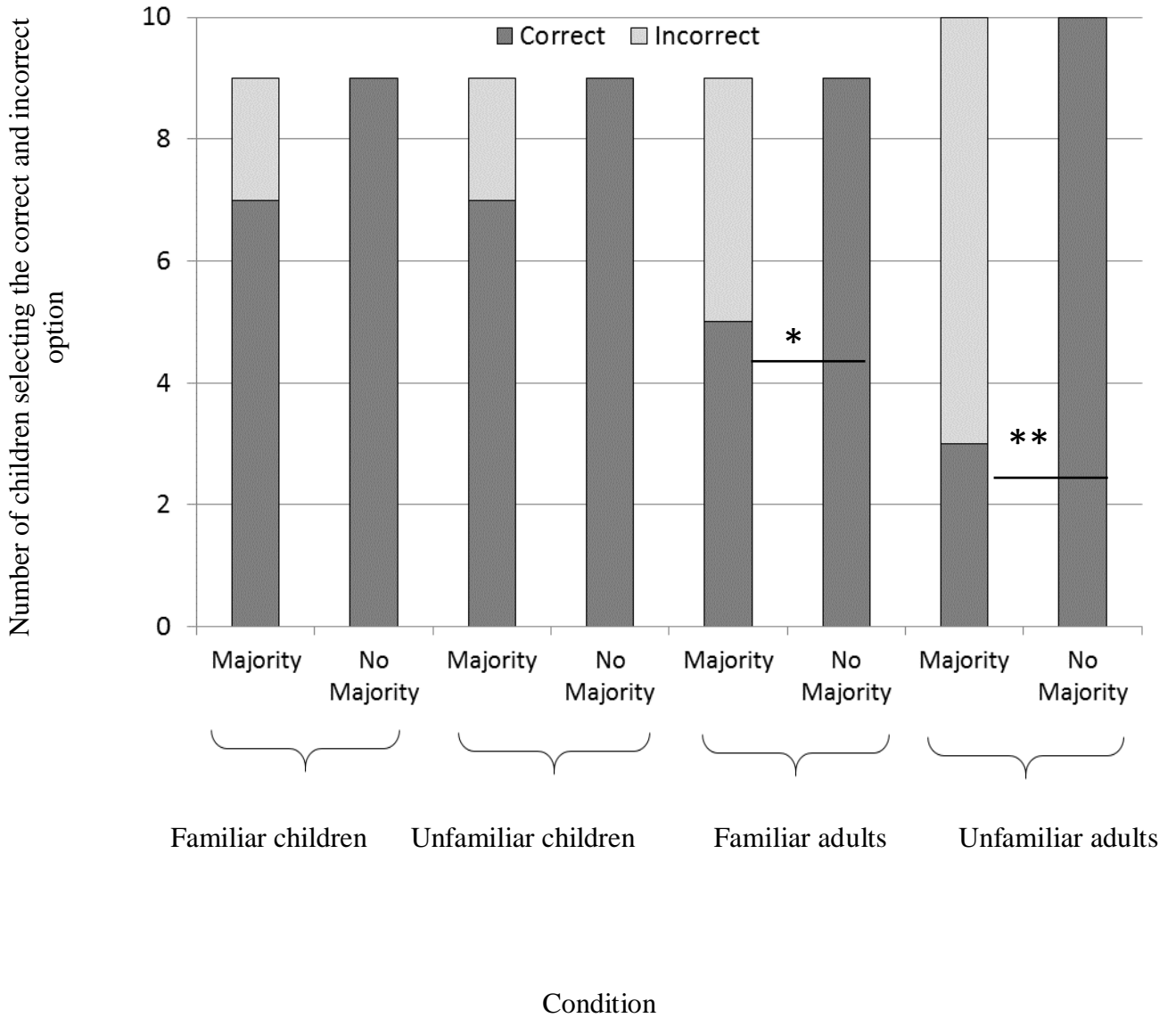


Figure 2. Dark gray bars show the number of children choosing the correct option in each phase. Light gray bars show the number of children selecting the incorrect option indicated by the majority. Stars indicate significant difference from the No-majority control condition. * $p < .05$; ** $p < .01$

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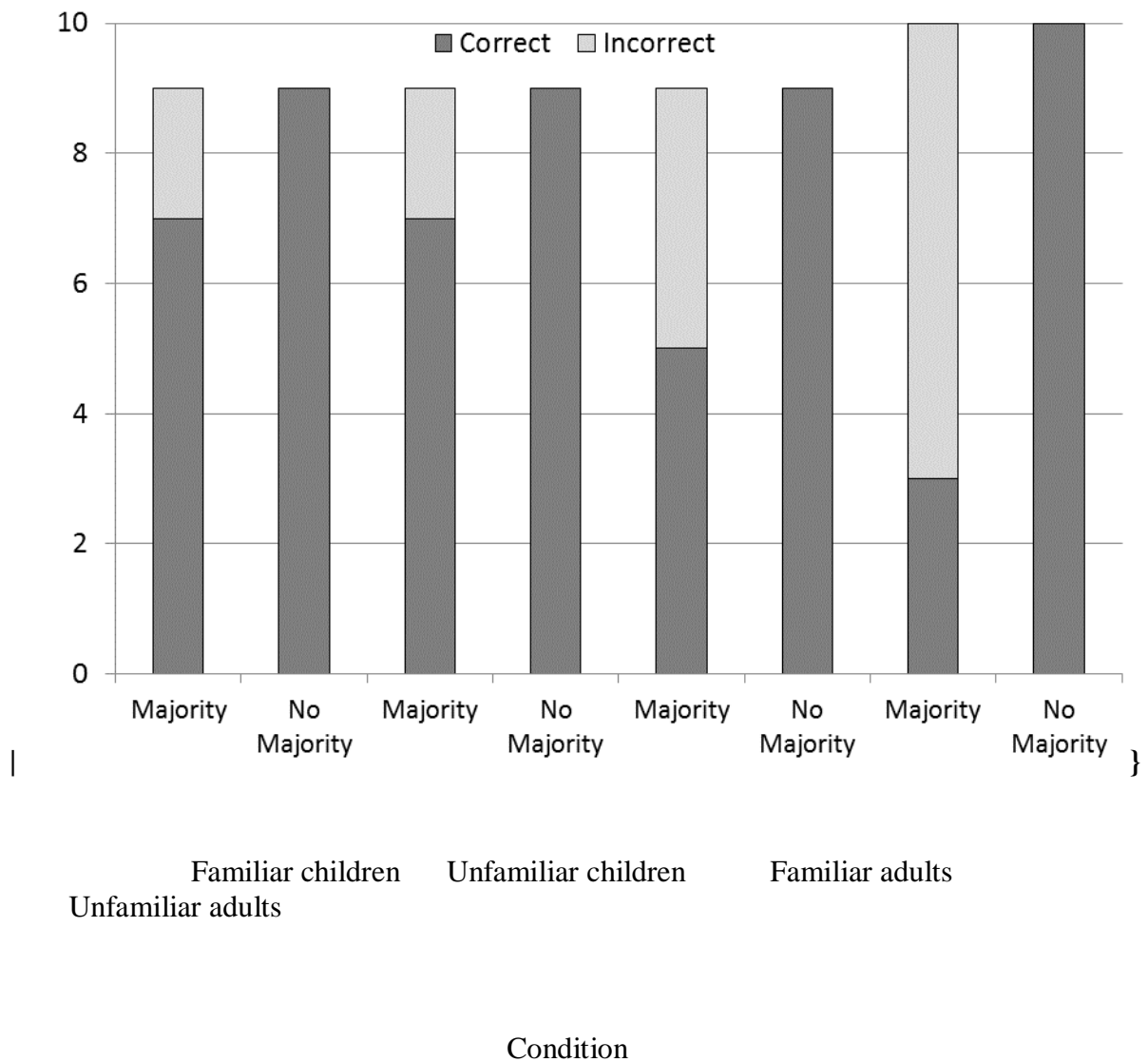


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