Supporting Information

Rhodes et al. 10.1073/pnas.1208951109

SI Text

Paragraph to Induce Essentialist vs. Nonessentialist Beliefs About Zarpies, Study 3. "Imagine that some scientists went to a far-away place and they discovered some people living there. These were people that the scientists had never studied before, so the scientists studied the people in detail. They looked at all of their biological features—their DNA and their blood types—and at their cultural practices. They discovered that the population was [essential condition: *very different from any*; nonessential condition: *very similar to every*] community that scientists had ever studied before. They had [*very different/very similar*] biological properties, and [*very different/very similar*] cultural practices, [*from/as*] any people that the scientists had ever studied. The scientists [*had discovered/named the people*] Zarpies!".

Description of Test Items. For explanation items (four items), children were asked to explain a property (e.g., "Why is this Zarpie climbing a tall fence?"). Explanation content was coded as 1 = intrinsic causes ("born with long legs to climb") or 0 = incidental causes ("to get to the other side"). Explanation scope was coded as 1 = categories ("because Zarpies are born...") or 0 = individual ("because he was born..."). Two independent raters blind to condition coded explanations; initial agreement was 96%, with differences resolved by discussion. For inheritance items (three items), children were told that a baby was born to a Zarpie mom but raised by a non-Zarpie mom, and were asked to predict whether the baby grew up to have a property of the Zarpie mom (1 = "loves to eat flowers") or the non-Zarpie mom (0 = "loves to eat crackers"). For induction items (six items), children were shown the property of one Zarpie ("Look at this Zarpie? This Zarpie makes a buzzing sound when she is angry") and were asked to predict whether each of two other Zarpies have the property (1 = yes; 0 = no). Three induction items asked about properties included in the story, and three items asked about novel properties not included in the story. For each item, one test Zarpie matched the target on race, sex, and age, and the other differed in these characteristics.

Summary of Memory Data. In Studies 1a and 1b, after the test items, participants were asked to recall the story after completing all of the test questions, to evaluate whether memory differences could account for condition differences in essentialism. In study 1a, adults were given a copy of the story illustrations with no accompanying text and were asked to write down the story as they remembered it. In study 1b, children were shown a copy of the story illustrations with no accompanying text and were asked to tell the story back to the experimenter. To score these data, participants received one point for each piece of correctly recalled information (e.g., "...is scared of ladybugs" would receive two points, one point for "scared" and the other point for "ladybugs"); data are presented as percentages of information recalled correctly. Two independent raters scored these data; initial interrater agreement was 89%, with differences resolved by discussion. In study 1a, adults' recall of the information in the sentences was quite good and did not differ by condition (mean ± SE, generic, 73.52 ± 1.91; specific, 73.49 ± 1.86; no label, 75.73 ± 1.90). Children's recall of this information was also quite good (mean ± SE, generic, 73.10 ± 2.72; specific, 77.08 ± 2.63; no label, 83.06 ± 2.47). Children's recall of the properties was equivalent in the generic and specific conditions, but children recalled more accurate information in the no label condition than in the generic condition [$P < 0.05$; $F(2, 43) = 3.77$; $P = 0.03$]. Given that the direction of this effect is counter to what would be expected if differences in memory contributed to differences in essentialism, these data do not support that possibility.

Table S1. Text of the storybooks, studies 1a and 1b

Page no.	Generic	Specific	No label
1	Look at this Zarpie! Zarpies love to eat flowers.	Look at this Zarpie! This Zarpie loves to eat flowers.	Look at this! This one loves to eat flowers.
2	Look at this Zarpie! Zarpies have stripes in their hair.	Look at this Zarpie! This Zarpie has stripes in her hair.	Look at this! This one has stripes in her hair.
3	Look at this Zarpie! Zarpies can bounce a ball on their heads.	Look at this Zarpie! This Zarpie can bounce a ball on his head.	Look at this! This one can bounce a ball on his head.
4	Look at this Zarpie! Zarpies like to sing.	Look at this Zarpie! This Zarpie likes to sing.	Look at this! This one likes to sing.
5	Look at this Zarpie! Zarpies climb tall fences.	Look at this Zarpie! This Zarpie climbs tall fences.	Look at this! This one climbs tall fences.
6	Look at this Zarpie! Zarpies flap their arms when they are happy.	Look at this Zarpie! This Zarpie flaps her arms when she is happy.	Look at this! This one flaps her arms when she is happy.
7	Look at this Zarpie! Zarpies have freckles on their feet.	Look at this Zarpie! This Zarpie has freckles on his feet.	Look at this! This one has freckles on his feet.
8	Look at this Zarpie! Zarpies hop over puddles.	Look at this Zarpie! This Zarpie hops over puddles.	Look at this! This one hops over puddles.
9	Look at this Zarpie! Zarpies hate walking in the mud.	Look at this Zarpie! This Zarpie hates walking in the mud.	Look at this! This one hates walking in the mud.
10	Look at this Zarpie! Zarpies draw stars on their knees.	Look at this Zarpie! This Zarpie draws stars on her knees.	Look at this! This one draws stars on her knees.
11	Look at this Zarpie! Zarpies can flip in the air.	Look at this Zarpie! This Zarpie can flip in the air.	Look at this! This one can flip in the air.
12	Look at this Zarpie! Zarpies are scared of ladybugs.	Look at this Zarpie! This Zarpie is scared of ladybugs.	Look at this! This one is scared of ladybugs.
13	Look at this Zarpie! Zarpies hate ice cream.	Look at this Zarpie! This Zarpie hates ice cream.	Look at this! This one hates ice cream.
14	Look at this Zarpie! Zarpies chase shadows.	Look at this Zarpie! This Zarpie chases shadows.	Look at this! This one chases shadows.
15	Look at this Zarpie! Zarpie babies are wrapped in orange blankets.	Look at this Zarpie! This Zarpie baby is wrapped in an orange blanket.	Look at this! This one baby is wrapped in an orange blanket.
16	Look at this Zarpie! Zarpies sleep in tall trees.	Look at this Zarpie! This Zarpie sleeps in tall trees.	Look at this! This one sleeps in tall trees.

Table S2. Text of the storybooks, studies 2a and 2b

Page no.	Text*,†
1	A/This Zarpie loves to eat flowers in the morning.
2	A/This Zarpie has striped hair.
3	A/This Zarpie bounces a ball on his head when he is outside.
4	A/This Zarpie loves to sing in the afternoon.
5	A/This Zarpie climbs tall fences when it is nice out.
6	A/This Zarpie flaps his arms when he is happy.
7	A/This Zarpie has freckles on his feet.
8	A/This Zarpie hops over puddles after it rains.
9	A/This Zarpie hates walking in the mud.
10	A/This Zarpie has starred knees.
11	A/This Zarpie flips in the air when he is excited.
12	A/This Zarpie is scared of ladybugs.
13	A/This Zarpie hates ice cream.
14	A/This Zarpie chases shadows when he sees one.
15	A/This Zarpie baby is wrapped in an orange blanket when it is born.
16	A/This Zarpie sleeps in tall trees.

*Each sentence in the indefinite singular generic condition was preceded by, "Look, this is a Zarpie!", and then began, "A Zarpie…." Each sentence in the specific condition was preceded by, "Look at this Zarpie!", and then began, "This Zarpie…." In study 2b, there was also a bare plural generic condition. In that condition, each sentence was preceded by, "Look at this Zarpie!", and then began, "Zarpies…." The rest of each sentence was modified to match for plurality, but the content of the sentences remained unchanged.

†The sentences were altered slightly from study 1 to study 2 so that the indefinite singular sentences would be considered generic based on recent work in linguistics (1)

1. Greenberg Y (2003) *Manifestations of Genericity* (Routledge, New York).

Table S3. Coding scheme for character references, study 3

Code	Definition	Examples
Generic*	Makes a claim about the category in general; has a bare plural, "Zarpies"; plural pronoun, "they"; definite plural, "the Zarpies"; or indefinite singular, "a Zarpie."	"This is a game that Zarpies like to play." "They sing in a different language."
Category label	Uses the category label "Zarpie."	"This Zarpie is smelling a flower."
Pronoun	Uses he, she, it, or they (nongeneric).	"He was tired from playing all day long."
Other category	Uses a category label other than "Zarpie."	"Does the baby look happy?"
Quantified	Refers to all or every Zarpie.	"They all seem to have similar clothing."

*To receive a generic code, the predicate had to be individual level in the linguists' sense, meaning that the property it expressed was one that is typically possessed for an extended period (1, 2). For example, the predicate "is going to the park" is not individual level, because going to the park is a short-lived event. However, "sings in a different language" is an individual level predicate, because it describes an ongoing, stable disposition. Thus, the sentence "They are going to the park" was not coded as generic; however, the sentence "they sing in a different language" was considered potentially generic. In the case of the pronoun "they" and the definite plural "the Zarpies," if the predicate in question was individual level and thus potentially generic, care was taken to determine whether there was any conversational antecedent that might suggest that the parent was talking about several Zarpies, in which case the utterance was not coded as generic. If there was no plural group to serve as the antecedent of the noun phrase, then it was coded as generic; however, if there was any doubt, then, to be conservative, the utterance was not coded as generic.

1. Carlson G (1977) References to kinds in English. PhD dissertation (University of Massachusetts, Amherst).
2. Milsark G (1974) Existential sentences in English. PhD dissertation (Massachusetts Institute of Technology, Cambridge, MA).

Table S4. Essentialist responses by condition and type of measure, Studies 1a and 1b

	Generic (bare plural)	Specific label	No label
Children			
Inheritance	0.52 (0.38, 0.67)	0.22 (0.12, 0.37)	0.35 (0.23, 0.49)
Explanation	0.50 (0.41, 0.59)	0.28 (0.21, 0.37)	0.20 (0.14, 0.27)
Induction	0.41 (0.34, 0.49)	0.39 (0.33, 0.47)	0.31 (0.25, 0.38)
Adults			
Inheritance	0.50 (0.38, 0.62)	0.32 (0.21, 0.44)	0.25 (0.16, 0.37)
Explanation	0.74 (0.67, 0.81)	0.24 (0.19, 0.31)	0.24 (0.18, 0.31)
Induction	0.68 (0.62, 0.74)	0.44 (0.38, 0.50)	0.28 (0.22, 0.34)

The Chronbach's α for each subscale examined separately was 0.85 for explanation, 0.62 for inheritance, and 0.84 for induction. For study 1, we piloted two additional measures previously used to assess essentialism for animal categories, asking about the stability and centrality of individual properties (1). Initial examination of these measures revealed that children had difficulty understanding the measures and responded quite differently from adults (which they did not do for any other measure of essentialism). Indeed, previous studies have shown that reasoning about the stability of individual properties for people is quite different from reasoning about the stability of individual properties for animals (2–5) and is a late-developing component of essentialism for social categories (not emerging until age 7–8 y). Thus, we chose not to include these measures and to focus instead on early-developing components of essentialist thought.

1. Gelman SA, Ware EA, Kleinberg F (2010) Effects of generic language on category content and structure. *Cognit Psychol* 61:273–301.
2. Gelman SA, Heyman GD (1999) Carrot-eaters and creature-believers: The effects of lexicalization on children's inferences about social categories. *Psychol Sci* 10:489–493.
3. Gelman SA, Heyman GD, Legare CH (2007) Developmental changes in the coherence of essentialist beliefs about psychological characteristics. *Child Dev* 78:757–774.
4. Kalish CW (2002) Children's predictions of consistency in people's actions. *Cognition* 84:237–265.
5. Rhodes M, Gelman SA (2008) Categories influence predictions about individual consistency. *Child Dev* 79:1270–1287.

Table S5. Essentialist responses by condition and type of measure, Studies 2a and 2b

	Generic (bare plural)	Generic (indefinite singular)	Specific
Children			
Inheritance	0.54 (0.38, 0.69)	0.38 (0.25, 0.53)	0.29 (0.18, 0.44)
Explanation	0.36 (0.27, 0.45)	0.33 (0.25, 0.42)	0.27 (0.20, 0.36)
Induction	0.23 (0.21, 0.34)	0.23 (0.17, 0.30)	0.11 (0.07, 0.17)
Adults			
Inheritance		0.21 (0.12, 0.32)	0.26 (0.17, 0.39)
Explanation		0.45 (0.37, 0.52)	0.17 (0.12, 0.24)
Induction		0.60 (0.53, 0.65)	0.36 (0.30, 0.43)

Across all measures in studies 1 and 2, the only measure to show a pattern of effects that was inconsistent with predictions was the inheritance measure for study 2 among adult participants. Also, among adults, the overall levels of essentialist responses were lower in the generic indefinite singular condition than in the generic bare plural condition of study 1 (Table S4). Linguistics research suggests that whether indefinite singulars are interpreted as generics (as opposed to as referring to specific individuals) is sometimes more ambiguous than in the case of bare plurals (1). Thus, one possibility is that adults did not interpret all of the indefinite singular sentences in the storybook as generic and thus received less generic input in the indefinite singular condition than in the bare plural condition, resulting in weaker effects (lower overall, and on only two of three measures). The Inheritance measure depends on particularly strong essentialist beliefs; thus, more generic input may be required to elicit effects on this particular measure. However, this study was not designed to evaluate effects on different components of essentialist beliefs and might not have included sufficient numbers of items of each type to enable us to draw strong conclusions about these issues.

1. Greenberg Y (2003) *Manifestations of Genericity* (Routledge, New York).