When Generic Language does not Promote Psychological Essentialism

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Abstract

Generic language (e.g., "Women are nurturing"; "Women do not like math") is prominent in child-directed speech, and has been shown to promote essentialist beliefs about the relevant kind, supporting stereotyping and prejudice. Here we investigate a theoretically-motivated intervention to break the link between generics and essentialist assumptions. In a study with 223 3-8-year-old children who learned about novel social groups from generic language, we demonstrate that a structural construal of generics (attributing the category-property association to stable external constraints) mitigates essentialist assumptions about social categories. We discuss practical applications for reducing stereotype endorsement, and theoretical implications regarding the meaning of generic language and the development of social kind representations.

Keywords: generic language, structural explanation, psychological essentialism, social categories

Imagine hearing the following: "women multitask a lot," "women quit jobs after having children," and "women have trouble getting tenure-track positions in mathematics." While they vary in content and valence, they share a common form: all three are "generic claims," attributing properties to the category in general (Carlson & Pelletier, 1995). Generic language plays an important role in learning and communicating about the social and natural world. Even though few people living in the western industrialized world have actually observed a whale feeding or seen an Inuit build an igloo, most have learned at some point that "whales eat plankton" and that "the Inuit build igloos," and may use these generics to teach a child about the natural and social world.

While generic language is enormously powerful and often appropriate, it has also been implicated in perpetuating essentialist stereotypes about categories (e.g., that women have the properties above due to their inherent, immutable nature), even in children. Here we investigate a theoretically motivated intervention to break the link between generic language and essentialist beliefs. Specifically, we test the hypothesis that with appropriate scaffolding even young children can adopt a *structural construal* (Vasilyeva, Gopnik, & Lombrozo, 2018) of generics, and that this construal mitigates essentialist assumptions. This result not only has practical implications for the role of generics in promoting harmful stereotypes, but also theoretical implications concerning the meaning of generic language and the development of social kind representations.

Prior work on generics about social categories

Generic language has recently come under scrutiny as a vehicle promoting psychological essentialism: the belief that a category has an underlying nature, or essence, that is causally responsible for observable characteristics (e.g., Cimpian, 2010; Cimpian & Markman, 2010; Gelman, 2003; Rhodes, Leslie, & Tworek, 2012; Wodak, Leslie, & Rhodes, 2015). Psychological essentialism underwrites a cluster of related beliefs and expectations, such as assuming inherent and often innate differences between members of different categories, where categories are separated by sharp and immutable boundaries. Such views of categories can interfere with scientifically accurate representations of the natural world (e.g., making it harder to grasp how one species can transform into another in evolutionary theory, Shtulman & Schulz, 2008). When applied to social categories, generic language can promote stereotyping, prejudice, and endorsement of the status quo in children and adults (Bastian & Haslam, 2004; Cimpian, 2010; Diesendruck & Menahem, 2015; Leslie & Gelman, 2012). For example, explanations of women's underrepresentation in mathematics that appeal to their "essential" or inherent nature have been shown to discourage girls from pursuing careers in this field (Leslie, Cimpian, Meyer, & Freeland, 2015).

One proposal is that generic language (a) reflects the essentialist beliefs of the speaker, and (b) plays an important causal role determining which social categories a learner will essentialize. On this view, generics about social kinds are by default understood to "hold because of common intrinsic features of the members of the kind" (Leslie, 2014, p. 216; Cimpian & Markman, 2011; Gelman & Rhodes, 2013;

Wodak, Leslie, & Rhodes, 2015). In other words, hearing a category label featured in a generic claim signals to the listener that the social group is an essentialized kind. Rhodes, Leslie, and Tworek (2012) offer evidence in support of this proposal. They taught children and adults about a novel social group, Zarpies, using either generic language (e.g., "Zarpies sleep in tall trees") or non-generic language, namely specific claims (e.g., "This Zarpie sleeps in tall trees"). They measured whether participants formed an essentialized representation of the group through a combination of explanation, inheritance, and generalization measures. They report "strong evidence that generic language is a mechanism by which social essentialist beliefs can be transmitted from parents to children....hearing generic language about a novel social category led both preschool-age children and adults in our samples to develop essentialist beliefs about the category" (p. 4).

Overall, it appears that generic language easily and powerfully triggers essentialist thinking. Even generics with positive valence (e.g., "girls are good at math") are problematic because they similarly promote an essentialized view of the category (Cimpian, 2010), thus supporting a more homogenous and immutable representation of category members. The implications of these results are particularly troublesome from a developmental perspective, since generic language serves as an important input to children learning about the social world.

Here we explore an approach based on a new theoretical proposal about the interpretation of generics, and report a test of this proposal with 3-8-year-old children. As Vasilyeva and Lombrozo (under revision) argue, generic claims are not necessarily interpreted in essentialist terms; they are also compatible with a *structural* construal, where the association between kind membership and a particular property is explained by stable external constraints. Consider the generics cited in the very beginning of this paper: they could, of course, be uttered by a person holding essentialist beliefs about women, implying that "women quit jobs after having children" and "women have trouble getting tenure track positions in mathematics" because of their inherent preferences or capacities. But the very same generics could be uttered by an activist fighting for equal rights and opportunities. They would say "women quit jobs after having children!" and "women have trouble getting tenure track positions in mathematics!" to call out the systematic barriers and additional challenges that women face in our society, resulting in lower participation in the work force (due, e.g., to the gender wage gap and limited paid parental leave), and under-representation of women in prestigious occupations (due, e.g., to biased hiring policies and the glass ceiling). It is not only possible to draw attention to these systematic patterns using gender and racial generics (e.g., "Black people end up in prison") – it is an especially apt way of doing so, since generics are particularly well-suited to conveying the idea that some characteristics of social groups are products of systematic societal patterns that can't be brushed off as mere coincidences (Ritchie, 2019).

On this view, while a generic claim acknowledges that the property is associated with kind membership in virtue of some stable facts about the kind, it does not commit the speaker or the listener to a particular explanation of the association: either stable internal/inherent causes, or stable external causes (or other types of relevant causal and/or constitutive relationships) could be responsible for the association. Vasilyeva and Lombrozo (under revision) report evidence that adults recognize multiple construals of generic meaning (including both internalist and structural) and that explanations can shape and shift these construals.

While it is promising that adults can understand generics in either internalist of structural terms, it is important to examine whether children are capable of doing so as well. Children are just learning about many social categories through adults' testimony, which includes generic claims. If the capacity to understand generics in structural terms is a late-developing skill, even adults who understand and use generics in structural terms could be unwittingly perpetuating essentialized stereotypes in their communication with children. It is thus especially pressing, for both theoretical and practical reasons, to understanding whether children are able to understand generics in structural terms, and the conditions under which they succeed in doing so.

Current Study

Our study examined the impact of generics on children's representations of social groups. We do not question the conclusion that generics *can* promote psychological essentialism (Rhodes, Leslie, & Tworek, 2012); rather, we question the generality of the conclusion. We hypothesize that generics do not always or necessarily promote essentialism in children. Specifically, we explore the possibility that generics only do so when they are construed in internalist terms (i.e., as indicating that category members have a property due to their inherent, essential nature). But if we give children tools to reinterpret generics structurally, we can potentially promote an alternative construal that blocks problematic essentialist assumptions.

To test this proposal, we taught 3-8-year-old children about two novel social groups, Zarpies and Lollies, using generic language (e.g., "Zarpies talk loudly"; "Zarpies look up as they walk"; "Zarpies sleep in tall trees"; "Lollies talk quietly"; "Lollies look down as they walk"; "Lollies sleep in caves"). Half of the children also received information about the stable structural characteristic of each group's environment: Zarpies live in the land of giants, and Lollies live in the land of elves. An additional group of children was tested in a control condition, where specific, rather than generic language was used to teach the properties (e.g., "This Zarpie talks loudly", "This Lollie sleeps in a cave"). All participants then completed a series of tasks designed to measure their essentialist beliefs (open-ended explanations of novel properties; switched-at-birth task measuring expectations about property heritability), as well as an additional measure probing their intuitions about the target groups (generalizability of properties).

Based on Rhodes, Leslie, and Tworek (2012), we expected that in the absence of additional structural information (the *plain generic* condition), generic language would promote an essentialist construal of the group, with properties causally rooted in the group's essence. For example, children might think of Zarpies as inherently predisposed to be loud and wanting to stand out, and of Lollies as inherently more quiet and subdued. Such a construal would be reflected in property explanations citing internalist, inherent characteristics, and relatively high expectations of property heritability, even for individuals who are brought up in a different social context. In contrast, we expected that adding information about the stable structural characteristics of the environment (the *structural generic* condition) would invite children to construe group properties cited in generics as products of these constraints (e.g., Zarpies might look up as they walk and talk loudly and sleep in tall trees because they live with giants: it's helpful to draw attention to oneself and avoid being on the ground at night so you don't get stepped on; Lollies might speak quietly, look down as they walk, and sleep in caves etc. to ensure harmonious cohabitation with elves by not disturbing them and not squishing them accidentally). We expected that under the structural construal of generics participants would explain novel category properties by citing stable properties of the environment (e.g., the presence of giants or elves) rather than inherent predispositions and preferences; we also expected the structural construal to weaken expectations of property heritability, by virtue of highlighting the dependence of group properties on context.

Essentialist construals have also been proposed to promote the generalization of properties across category members and boost expectations of property stability. In fact, property generalizability is routinely used as a measure of psychological essentialism (e.g., Gelman, 2003; Rhodes, Leslie, & Tworek, 2012). However, people might expect properties to generalize for reasons other than inherent similarities (Lombrozo & Gwynne, 2014; Vasilyeva & Coley, 2013), so high generalizability is not a reliable cue to essentialist beliefs. When a social group is affected by stable structural constraints, we can also expect relative homogeneity of properties across group members, even in the absence of a shared group essence (e.g., in our example we can expect relative homogeneity across Zarpies simply because they are adapted to a common constraint: sharing space with giants). We thus predicted that both the plain and structural generic conditions would support expectations of high property generalizability, relative to the control condition.

We spanned a fairly broad developmental range, from 3 to 8 years of age, since prior work has documented early signs of structural thinking in children as young as 3, with the capacity to appreciate structural constraints becoming more robust through ages 5 and 6 years (Vasilyeva, Gopnik, & Lombrozo, 2018)

Figure 1: Sample illustrations of properties attributed to Zarpies and Lollies (look up / down as they walk; speak loudly / quietly; sleep in tall trees / caves).

Method

Participants Two-hundred-and-twenty-three children from 3 to 8 years of age were recruited in preschools and museums in San Francisco Bay Area, California (younger group (3-5-years) mean age 59 months, SD = 7; older group (6-8 years) mean age 83 months, SD=7).

Materials, Design and Procedure All children were tested in individual sessions with an experimenter, who read out an illustrated story about two novel social groups, Zarpies and Lollies, living in Zarpieland and Lollieland, respectively. Accompanying illustrations showed each group as diverse in age, gender, and racial composition; the two groups could be visually differentiated by clothing color. Each child was assigned to one of three conditions: plain generic language, structural generic language, and specific language (control). In the two generic language conditions, the experimenter used generic language to teach participants properties of each group (e.g., "Look at this Zarpie! Zarpies sleep in tall trees"; "Look at this Lollie! Lollies sleep in caves"). In the specific language condition, the same properties were attributed to individual category members (e.g. "Look at this Lollie! This Lollie sleeps in a cave"). Each property was illustrated by an image (see Figure 1 for examples). The same set of properties and images was used across the three experimental conditions.

The crucial manipulation concerned the framing of the generic language in the two generic conditions. In the plain generic condition, no additional information was provided. In the structural generic condition, participants additionally learned that Zarpies live in the land of giants, and Lollies live in the land of elves. These stable features of each group's

environment offered an account of the group features (e.g., children learned that Zarpies look up as they walk because this way they can spot the giants, and Lollies look down as they walk because this way they don't step on elves).

After learning the properties and responding to comprehension checks, children completed a series of tasks designed to measure the extent to which they construed the target social groups in essentialist vs. structural terms, as well as to probe their intuitions about the generalizability / stability of properties.

In the *property explanation task*, participants were presented with two novel properties and asked to explain them. For instance, in the generic conditions they heard: "Zarpies paint colorful sparkling stripes on their hair. Why do they do that, what do you think?" In the specific condition they heard: "This Zarpie paints colorful sparkling stripes on her hair. Why does she do it, what do you think?"

In the *switched-at-birth task* designed to measure intuitions about property heritability, participants learned about a baby who was born to a Zarpie mom, but was brought up by a Lollie mom in Lollieland (or vice versa). Participants indicated whether the baby, when grown up, would share specified properties with the birth mother or the adoptive mother. The properties included looking up/down while walking, speaking loudly/quietly, liking/hating spicy food, and swimming really slow/fast.

The property generalization task introduced two novel properties: being good at climbing very tall fences and playing a game called "flub." Each property was attributed to one Zarpie. Participants were then shown two new Zarpies (differing from the first Zarpie in age, race, and gender), and asked whether they share the property. Participants selected one of three response options, generalizing the property to both of the new category members, to only one of them, or to neither (indicating expectations of high, moderate, or low property homogeneity across category members, respectively).

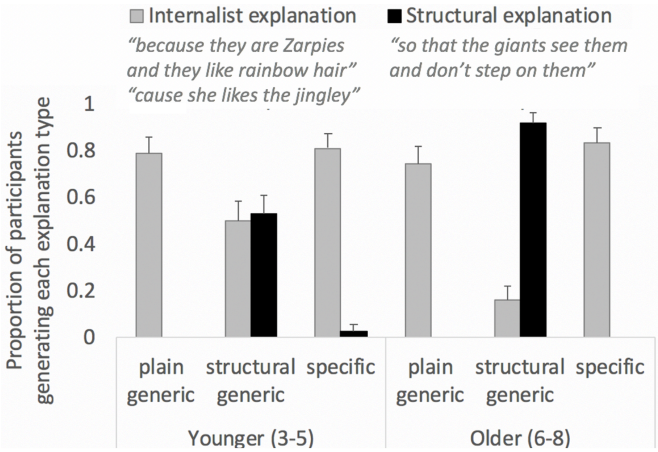

Figure 2: Proportion of participants generating internalist and structural explanations, as a function of language condition and age group. Error bars: 1 SE of proportion.

Results

Property Explanation Participants' explanations were transcribed and coded by two independent coders. They were coded as "internalist" if they cited preferences or other characteristics true of the groups or individuals in isolation from their context (e.g., "because they are Zarpies and they like rainbow hair"; "'cause she likes the jingley"). They were coded as structural if they cited stable characteristics of the social or physical context (e.g., "so that the giants see them and don't step on them"). Explanations citing both types of factors received both codes. The proportion of participants generating each explanation type is shown in Figure 2.

Due to null or near-null frequencies of structural explanations in some design cells, we conducted two sets of analyses. First, we examined the distribution of internalist explanation in a logistic regression, predicting whether a participant generated an internalist explanation (yes or no) from the language condition (plain generic, structural generic, specific), centered age in months, and their interaction. A significant interaction was observed, model likelihood ratio test $\chi^2(2) = 6.31$, $p = .043$, which we explored further by switching to the categorical age predictor (younger vs. older children). The interaction was driven by the structural generic condition, in which older children generated fewer internalist explanations than younger children (*OR* (odds ratio) = .19, $z = -2.95$, $p = .003$). The two age groups were equally likely to generate internalist explanations in the plain generic condition, $z = -.43$, $p = .630$, and in the specific language condition, $z = .27$, $p = .802$. Within each age group, the structural generic condition produced the lowest rate of internalist explanations (younger: vs. plain generic *OR* = .27, $z = -2.55$, $p = .011$; vs. specifc *OR* = .23, $z = -2.72$, $p = .007$; older: vs. plain generic *OR* = .07, $z = -4.58$, $p < .001$; vs. specific *OR* = .04, $z = -5.15$, $p < .001$). The plain generic and specific language conditions did not differ (younger: $z = .23$, $p = .817$; older: $z = .93$, $p = .354$). Overall, older children were marginally less likely to generate internalist explanations than older children (*OR* = .55, $z = 1.75$, $p = .079$).

In the second analysis, we examined novel property explanations generated in the structural generic condition only, in a mixed effects logistic regression with age (in months) and explanation type as predictors, allowing for random intercepts across participants, using the *glmer* command in R. We observed a significant interaction, likelihood ratio test $\chi^2(1) = 27.88$, $p < .001$, which we explored by switching to the categorical age predictor. The younger children were equally likely to generate internalist and structural explanations in this condition, $z = .236$, $p = .814$. Older children were significantly more likely to generate structural explanations than internalist explanations, *OR* = 58.56, $z = 5.43$, $p < .001$.

Switched at Birth Figure 3 shows the proportion of trials on which participants in each condition expected the baby to develop properties shared with the birth parent, rather than

with the adoptive parent (indicating a more essentialist construal of the category), averaged across the four trials and across participants. Participants' responses were analyzed as binary outcomes (attributing the property of the adoptive vs. birth parent), predicted from language condition (plain generic, structural generic, specific language), centered age in months, and their interaction, allowing for random participant intercepts, using the *glmer* command in R. The interaction between condition and age group was not significant, $\chi^2(2) = 1.52$, $p = .467$, and was dropped from the model. Both age and condition significantly affected participants' responses. The expectation that an adopted baby would develop the properties of the birth-parent became less pronounced with age, $z = 2.05$, $p = .041$ (mean proportion of birth-parent selections in the younger vs. older groups, mean proportion of birth-parent selections in younger vs. older groups: .54 vs .40). Most importantly, the structural framing of generics significantly reduced essentialist expectations about the baby's properties relative to the plain generic language, $z = -3.01$, $p = .006$, and relative to specific language, $z = -3.18$, $p = .004$; the latter two did not differ, $z = .04$, $p = .999$.

Property Generalization The mean number of category members (out of 2) predicted to share the property with the target individual in each condition is shown in Figure 4. Participants' generalization responses were treated as an ordinal variable (with levels corresponding to the number of individuals sharing the property: 0, 1, or 2), and were predicted from language condition (plain generic, structural generic, specific language), centered age in months, and their interaction, allowing for random participant intercepts, in an ordinal regression, using the *clmm* command in R. The

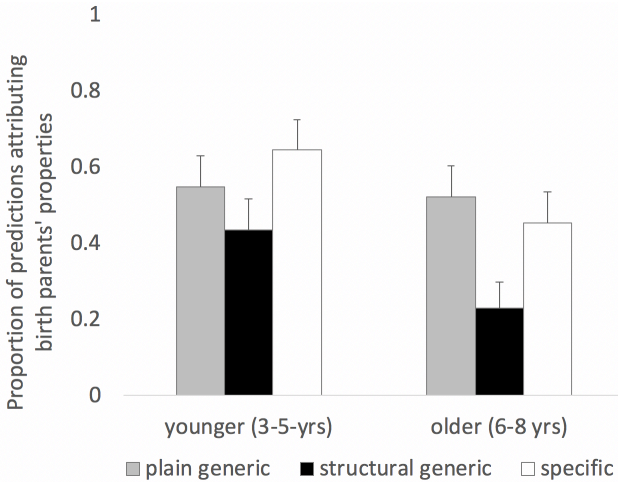

Figure 3: The mean proportion of times participants expected the baby to develop properties of the birth parent, rather than the adoptive parent (indicating a more essentialist construal of the category), as a function of condition and age group, averaged across trials and participants. Error bars: 1 SE of proportion.

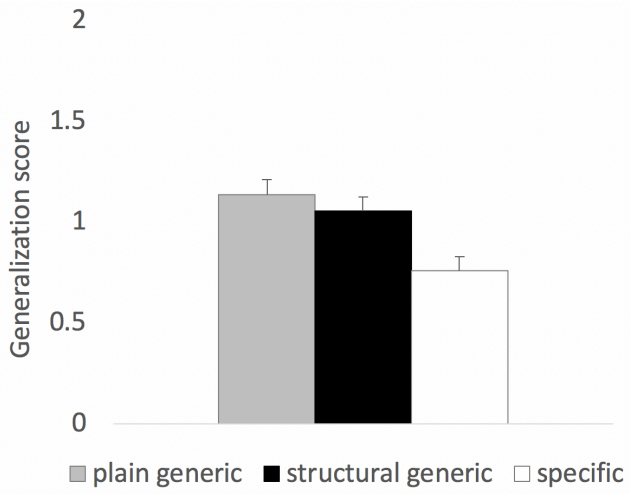

Figure 4: The mean number of category members (out of 2) predicted to share the property with the target individual in each condition. Error bars: 1 SEM.

interaction was not significant, likelihood ratio .90, $p = .639$, and was dropped from the model. Participant age did not have a significant effect, $z = 1.08$, $p = .281$. Language condition, however, did have a significant effect, likelihood ratio 12.96, $p = .001$: as predicted, both plain generic language, $z = 3.34$, $p < .001$, and structural generic language, $z = 2.68$, $p = .007$, significantly boosted generalization ratings, relative to specific language. The generalization ratings did not differ across the two generic language conditions, $z = .75$, $p = .456$.[1]

Discussion

Our findings demonstrate that children as young as 3-5 years of age already recognize that generic language supports both essentialist and structural readings: properties of social kinds can be seen as products of kind essences, or as stable structural constraints acting on social positions. When appropriate cues to the existence of stable structural constraints were available (in our example, in the form of information about the group sharing the space with giants or elves), children were able to interpret generics about the novel groups in structural terms, instead of forming essentialized representations (as suggested by the types of explanations they generated for novel properties of group members, and by their intuitions about the heritability of properties). These findings offer a new perspective, questioning the generality of previous claims about the role of generic language in the perpetuation of essentialism and stereotyping across development, with the associated negative consequences of an essentialist construal (e.g., Cimpian, 2010; Cimpian & Markman, 2010; Leslie, 2014; Rhodes, Leslie, & Tworek, 2012). We show that these effects can be moderated by a structural construal.

[1] But see Vasilyeva & Lombrozo (under revision) for evidence that generalization patterns under the internalist and structural construals can diverge when category membership and social environment are deconfounded.

Our findings are particularly important given that few other "damage control" strategies for managing generic language are on offer. One proposed strategy is to draw attention to the precise feature prevalence in a category, e.g., responding to "Muslims are terrorists" with "Well, what percentage of Muslims commit terrorist acts?" (Wodak, Leslie, & Rhodes, 2015). This may work well when the generic cites a striking but very rare property. But when generics cite properties with relatively high prevalence (women *do* leave the work force after having children more often than men do; Black people *are* over-represented in prisons), appealing to accurate statistics may be insufficient, without offering an alternative (non-essentialist) explanation for what appears to be a highly non-accidental regularity. Another strategy for managing social generics is to negate the attributed property, e.g., to assert that "women do not quit jobs after having children" (Haslanger, 2011; Langton, Haslanger, & Anderson, 2012). Again, when the actual property prevalence is relatively high, this may appear to contradict the data, discrediting the speaker. More importantly, negating the property fails to question the presupposition that the group has a distinctive essence, and is therefore unlikely to mitigate negative consequences of an essentialist construal (Foster-Hanson, Leslie, & Rhodes, forthcoming; Wodak, Leslie, & Rhodes, 2015). Finally, replacing generics (or responding to them) with quantified statements (involving the quantifiers "some," "many," "most") does not work either, since children (and sometimes adults) tend to interpret and remember quantified statements as generics (Hollander, Gelman, & Star, 2002; Leslie & Gelman, 2012). Given the problematic social consequences of essentialist beliefs about social categories, identifying an effective way to neutralize essentialist interpretations of generics, as we do in this paper, is of no small practical value.

Our findings also raise an intriguing possibility that goes beyond buffering the negative consequences of essentialist generics: the possibility of harnessing generic language to enhance structural thinking. As mentioned above, generics do a better job than, for example, quantified statements at flagging systematic societal patterns that call for an explanation (as opposed to mere coincidences; Ritchie, 2019). While the direct test off this claim is beyond the scope of this paper, the reported findings do document the requisite compatibility between generics and structural thought.

In terms of theoretical import, our findings bear on our understanding of generic language and the development of social kind representations. While we do not offer a worked out account of generic meaning here, we introduce important constraints on such accounts: the requirement to accommodate a structural construal of generics. This is compatible with many aspects of prior accounts characterizing generic language as expressing systematic regularities (Carlson, 1995; Nickel, 2017; Tessler & Goodman, 2019), indicating that the property is connected to the kind in a non-accidental way (e.g., principled connections; Haward, Wagner, Carey, & Prasada, 2018; Prasada & Dillingham, 2006; although generics sometimes do support accidental generalizations; Prasada & Dillingham, 2006; Vasilyeva & Lombrozo, under revision), and signaling that the category in question is a genuine kind (Noyes & Keil, 2019; Gelman et al., 2010; Rhodes & Mandalaywala, 2017). What we suggest is that the underlying commitments to the causal origin of these kind-property relationships are less constrained than previously recognized. When we learn about social groups through generics, we may establish representations that contain some basic information about the "kind-ness" of the category, yet such representations are compatible with a rich variety of kinds. Essentialized kinds are just one way to be a kind.

In addition to the theoretical and practical implications noted above, our findings also have an important methodological implication: given that high property generalizability is compatible with a structural construal, it cannot be treated as especially diagnostic of essentialist thinking (cf. Gelman, 2003; Rhodes, Leslie, & Tworek, 2012; see also Noyes & Keil, 2019).

One interesting set of remaining open questions concerns the default interpretation of generics, and more broadly, the default construal of category-property associations. With respect to the interpretation of generics, we have shown that children can interpret generics one way or another when fairly clear, disambiguating explanatory cues are available (e.g., in the form of information about the structural constraints). It remains unclear what people – and children in particular – do when a stimulus is truly ambiguous. Do we suspend judgment completely until further information comes in, or do we go with some prior expectation based on prior personal experience or community norms? Once a construal is adopted, how is it revised?

With respect to the overall "default" construal of categories and their properties, if we do see an early preference for one construal, is it a product of early learning, or is one construal inherently less cognitively costly? It is noteworthy that while we do see some age differences in some elements of essentialist thinking – e.g., in our sample, the younger children were more likely than the older children to assume that adopted individuals inherit their properties from birth parents who share group membership, consistent with an essentialized construal of groups – the sensitivity of this judgment to structural cues, when they were provided, appeared stable within the examined age range. This points to the possibility that while young children may be less likely to consider structural explanations of the social world spontaneously, and might have a harder time verbalizing them in open-ended tasks, when they are provided they are just as responsive to them as older children (and in some cases, as responsive as adults; Vasilyeva, Srinivasan, Elwood-Lowe, Delaney, Gopnik, & Lombrozo, under revision).

In practice, we expect that interpretation of any given generic will greatly depend on the relative ease of generating or comprehending structural and/or essentialist explanations for the specific attributed property. Category properties may vary in what type of explanation they spontaneously lend

themselves to (Noyes & Keil, 2019; Vasilyeva & Coley, 2013), and in the extent to which they are flexibly compatible with alternative explanations. Acknowledging this variability, we see our contribution as demonstrating that even for one and the same property, we can induce different interpretations of generics by varying the explanation of a category-property connection. Moreover, our theoretical framework and findings do more than point out limitations with essentialism accounts (Noyes & Keil, 2019): we develop and characterize in detail one specific causal-explanatory stance – the structural construal - under which social kinds can be represented without invoking essentialist assumptions.

In sum, we show that while generic language can promote essentialist thinking under some conditions, it can carry a structural message in others. In other words, the generic claim that "generics promote essentialism" needs to be qualified.

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