Journal of Experimental Child Psychology xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Journal of Experimental Child Psychology

journal homepage: www.elsevier.com/locate/jecp

Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China

Steven O. Roberts [a,*], Cai Guo [b], Arnold K. Ho [a], Susan A. Gelman [a]

[a] Department of Psychology, University of Michigan, Ann Arbor, MI 48109, USA
[b] Department of Psychology, Stanford University, Stanford, CA 94305, USA

ARTICLE INFO

Article history:
Available online xxxx

Keywords:
Group norms
Social cognitive development
China
Novel groups
Cultural comparisons
Conformity

ABSTRACT

Research with U.S. samples found that children use descriptive group regularities (characteristics shared by individuals within a group) to generate prescriptive judgments (characteristics that *should be* shared by individuals within a group). Here, we assessed this descriptive-to-prescriptive tendency in a sample of children (ages 4–13 years) and adults (ages 18–40 years) from mainland China. Participants were introduced to novel groups (i.e., Hibbles and Glerks) who engaged in contrasting morally neutral behaviors (e.g., listening to different kinds of music) and then to conforming and non-conforming individuals (e.g., a Hibble who listened to music more typical of Glerks). Like U.S. children, Chinese children disapproved of non-conformity and rates of disapproval declined with age. However, compared with U.S. children, younger Chinese children (ages 4–6 years) rated non-conformity more disapprovingly, and unlike U.S. adults, Chinese adults rated non-conformity more negatively than conformity. Moreover, compared with U.S. participants, Chinese participants across all age groups appealed more often to norm-based explanations when justifying their disapproval. These data provide a cross-cultural replication of children's descriptive-to-prescriptive tendency but also reveal cross-cultural variation, and they have implications for understanding the mechanisms that underlie stereotyping and normative reasoning.

* Corresponding author.
E-mail address: sothello@umich.edu (S.O. Roberts).

http://dx.doi.org/10.1016/j.jecp.2017.03.018
0022-0965/

Introduction

Recent research found that children use descriptive group regularities (the way a group *is*) to make prescriptive judgments (the way a group *should be*) (Roberts, Gelman, & Ho, 2016). Specifically, Roberts et al. (2016) introduced middle-class U.S. children (ages 4–13 years) to two novel groups, Hibbles and Glerks, who differed from each other in innocuous behaviors (e.g., listened to a certain kind of music, ate a certain kind of food). When shown non-conforming group members (e.g., a Hibble who listened to a kind of music that was more typical of Glerks), children, particularly those in the youngest age group (4–6 years), disapproved, evaluated the acts as negative, and explained their evaluations through norm-based reasoning (e.g., "Hibbles are *not allowed* to listen to that kind of music"). Importantly, children's descriptive-to-prescriptive tendency was robust across intergroup contexts; regardless of whether Hibbles were in cooperation or in competition with Glerks, children judged that it was bad for Hibbles to not conform to their group. Critically, however, when the emphasis was on individuals and not on groups, children were more accepting of non-conformity.

In a follow-up study, Roberts, Ho, and Gelman (2017) found that relatively minimal input generated children's prescriptiveness. That is, previous research demonstrates that group presence, group labels, and generic statements independently provide children with cues to group membership (Bigler & Liben, 2006; Rhodes, Leslie, & Tworek, 2012; Waxman, 2010), and all these factors were provided simultaneously to children in Roberts et al. (2016). To more precisely understand what information children used to detect group regularities, Roberts et al. (2016) randomly assigned children (ages 4–9 years) to one of four conditions that manipulated how regularities were presented: group presence (e.g., "These ones [a group of three individuals] listen to this kind of music"), group labels (e.g., [showing an individual] "This Hibble listens to this kind of music"), generics (e.g., [showing an individual] "Hibbles listen to this kind of music"), or control (e.g., "This one [individual] listens to this kind of music"). Children evaluated non-conformity negatively in all conditions but the control condition, demonstrating that group presence, category labels, and generic statements each provoked children to treat social groups as having normative force, thereby highlighting further how easily children take on a normative stance.

Taken together, the findings reported by Roberts et al. (2016, 2017) provided new insight into children's normative reasoning and highlighted the profound implications group concepts have for stereotyping and normative reasoning. If a group is characterized by a property, children believe that individual group members *should be* characterized by that property. The readiness, robustness, and ease with which children's descriptive-to-prescriptive tendency is elicited may be evolutionarily rooted in humans' group-based way of life. That is, recognizing and conforming to group norms is adaptive for the self (e.g., leading to social acceptance and opportunities for collaborative learning) and the group (e.g., leading to more efficient group functioning and strength against competing groups) (Tomasello, 2016). Thus, individuals who can quickly learn, adopt, and enforce their group's norms are model group members as they increase their own (and their group's) functioning, resources, and survival.

Consistent with the notion that a preference for normative conformity has evolutionary roots, recent research demonstrates that early in development concepts of norms play a critical role in children's social cognition (Rakoczy & Schmidt, 2013). For example, preschoolers are quick to learn norms (Rakoczy, Warneken, & Tomasello, 2008), especially when they are modeled by adults (Rakoczy, Hamann, Warneken, & Tomasello, 2010), and they learn norms even when there is no language or instruction suggesting that they should do so (Schmidt, Rakoczy, & Tomasello, 2011) and even when they see the behavior occur only once (Schmidt, Butler, Heinz, & Tomasello, 2016). In addition, children not only learn norms from others but also spontaneously create their own norms and teach them to others (Göckeritz, Schmidt, & Tomasello, 2014). When they observe someone violate a norm, they feel emotionally agitated (Hardecker, Schmidt, Roden, & Tomasello, 2016) and respond with protest and critique (e.g., "You *can't* do that!") (Cooley & Killen, 2015; Rakoczy & Schmidt, 2013; Riggs & Young, 2016) even when they understand that the norm violation was unintentional (Samland, Josephs, Waldmann, & Rakoczy, 2016), but especially when they believe it was freely chosen (Josephs, Kushnir, Gräfenhain, & Rakoczy, 2016). In addition, children show more positive feelings

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

toward norm enforcers than toward individuals who leave norm violations uncorrected (Vaish, Herrmann, Markmann, & Tomasello, 2016). Together, these studies demonstrate that children not only learn and accept norms from others but also create, transmit, and enforce them.

If normative reasoning, as outlined above, is indeed evolutionarily rooted, and therefore is a central and fundamental aspect of human cognition (Tomasello, 2016), children's descriptive-to-prescriptive tendency, even under novel and minimal conditions, should emerge cross-culturally. To date, however, this is unclear, given that Roberts et al. (2016, 2017) conducted their research with U.S. samples. Indeed, the overreliance on samples recruited from WEIRD (Western, educated, industrialized, rich, and democratic) cultures is a problem for the general field of psychology (Henrich, Heine, & Norenzayan, 2010), the subfield of developmental psychology (Legare & Harris, 2016), and the specific research on children's normative reasoning, which includes mostly data derived from Germany, the United States, and Sweden (for examples, see Cooley & Killen, 2015; Göckeritz et al., 2014; Josephs et al., 2016; Kenward, 2012; Roberts et al., 2016, 2017; Samland et al., 2016; Schmidt, Hardecker, & Tomasello, 2016; but see research on "over-imitation," reviewed below, for a notable exception). Because of this, our theoretical models are founded on the assumption that WEIRD cultures provide a standard from which to understand normative reasoning.

In an effort to test the extent to which children's descriptive-to-prescriptive tendency, with regard to novel and innocuous groups, replicates (and varies) cross-culturally, and to move toward more inclusive, diverse, and generalizable data, we examined whether children recruited in mainland China, like children recruited in the United States, interpreted descriptive group regularities as having normative force. Our focus on Chinese participants was motivated by previous research demonstrating that Chinese children, compared with U.S. children, engage in more group-based reasoning (as reviewed below), suggesting that Chinese children may also more often use descriptive group regularities to make prescriptive judgments. Thus, comparing children's descriptive-to-prescriptive tendency across two distinct cultures (i.e., the United States and China) permitted a test of the replicability of previously detected effects with U.S. children (Roberts et al., 2016, 2017) while also testing for cross-cultural variation.

As discussed above, because normative reasoning may have an evolutionary basis (Tomasello, 2016), and because children quickly and intuitively enforce normative conformity (Rakoczy & Schmidt, 2013), it is possible that Chinese children, like U.S. children, would show a descriptive-to-prescriptive tendency. Further evidence for this possibility is cross-cultural similarity in children's tendency to over-imitate (i.e., faithfully reproduce modeled actions), suggesting that children's adherence to norms is a universal component of human cognition (see Nielsen & Tomaselli, 2010). Specifically, children across several diverse contexts (e.g., Aboriginal and Western Australia, Botswana, England, South Africa, Sweden) interpret the actions of adults as normative, imitating them precisely even if they understand that the actions are inconsequential for achieving a goal (e.g., tapping a stick on the outside of a box before using it to dislodge a bolt) (Horner & Whiten, 2005; Kenward, 2012; Nielsen & Mushin, 2014). Because children across diverse cultural contexts interpret neutral behaviors as normative in their imitations, they may also interpret neutral descriptive group regularities as normative. Critically, however, the extent to which children engage in normative reasoning, including the extent to which they engage in imitative behavior, varies cross-culturally. For example, children in Vanuatu, a Pacific island nation, compared with children in the United States, show higher rates of imitation (Clegg & Legare, 2016; see also Berl & Hewlett, 2015). Clegg and Legare (2016) argued that this cross-cultural variation could stem from non-Western cultures placing greater value on social conformity (see also Little, Carver, & Legare, 2016; Strachan, Samuel, & Takaro, 2007).

Indeed, in their seminal review, Markus and Kitayama (1991) discussed how people in Eastern cultures, such as China, tend to hold an interdependent view of the self, leading them to value social responsibility, interconnectedness, group solidarity, and fitting in. In contrast, people in Western cultures, such as the United States, tend to hold an independent view of the self, which entails valuing self-expression, autonomy, uniqueness, and standing out (see also Henrich et al., 2010). Furthermore, recent work has documented East–West cultural differences in neural substrates related to the detection of social norm violations (Mu, Kitayama, Han, & Gelfand, 2015). There is, of course, variation in the degree to which individuals within cultures hold certain ideologies (e.g., not every person in the United States values independence over interdependence), although at the aggregate level these cultural differences are well

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

documented (Oyserman, Coon, & Kemmelmeier, 2002) and have important implications for behavior and social cognition. For example, Wang, Leichtman, and Davies (2000) documented that U.S. and Chinese families provided their children with different frameworks from which to create and understand narratives; storytelling within U.S. families typically involved reference to individual feelings, thoughts, and opinions, whereas storytelling within Chinese families more often involved reference to social relationships, rules, and responsibilities. Moreover, Li and Wang (2004) found that U.S. children believed that learning improved the *individual* (e.g., self-growth), whereas Chinese children believed that learning improved the larger *collective* (e.g., moral development). Relatedly, Wang (2004) asked children to recollect an early memory and to describe themselves and found that U.S. children tended to reference personal emotions and opinions, whereas Chinese children tended to reference social interactions and group activities (for comparable findings from adult samples, see Wang, 2001). In other work, Fu, Xu, Cameron, Heyman, and Lee (2007) found that Chinese children (compared with Canadian children) were more likely to disadvantage an individual to help a group than to disadvantage a group to help an individual, suggesting that they valued group needs over individual needs. Thus, because culture contributes to differences in children's behavior and social cognition, it may also contribute to differences in children's descriptive-to-prescriptive tendency.

The current research

Given the cross-cultural differences reviewed above, we were interested in the extent to which children's descriptive tendency replicated and varied cross-culturally. We examined whether Chinese children (ages 4–13 years), like same-aged U.S. children, used descriptive group regularities to make prescriptive judgments. As in Roberts et al. (2016, 2017), we introduced children to novel groups: Hibbles and Glerks, who were characterized in terms of morally neutral behaviors (e.g., the kind of music they listened to) and then to a series of conforming and non-conforming individuals (e.g., a Hibble who listened to music more typical of Glerks). We then measured children's *disapproval* of the behavior, *negativity* toward disapproved behaviors, and open-ended *explanations* regarding how children justified their evaluations. Including open-ended responses was important because they can be a more culturally sensitive method for detecting variation in children's concepts; they permit participants to share their own perspectives, use their own vocabularies, and generate their own responses (Hart & Edelstein, 1992). We focused on 4- to 13-year-olds because this permitted a direct comparison with the age range in Roberts et al. (2016) and because important developmental changes involving social concepts occur throughout these years (Bigler & Liben, 2006; Quintana, 1998; Rhodes & Gelman, 2009; Roberts & Gelman, 2015).

We had several hypotheses. First, because a preference for normative conformity may be evolutionarily rooted (Tomasello, 2016), and because early in development children often take a strong normative stance (Rakoczy & Schmidt, 2013), we hypothesized that Chinese children, like U.S. children in previous research, would use descriptive group regularities (what *is*) to generate prescriptive judgments (what *should be*). That is, we predicted that they would disapprove of non-conformity, evaluate it negatively, and use norm-based reasoning when explaining their evaluations (H1). Second, because Chinese children, like U.S. children, become increasingly likely with age to consider individual traits and attributes in their social reasoning (Wang, 2004), we hypothesized that with age Chinese children would be more approving of non-conforming individuals (H2). Notably, however, an alternative hypothesis was that, by virtue of having greater experience with socialization and enculturation of the concept of interconnectedness, with age Chinese children would be more *disapproving* of non-conforming individuals. Third, because Chinese culture, on average, is more likely than U.S. culture to value interdependence, we hypothesized that Chinese participants would be more likely than U.S. participants to show a descriptive-to-prescriptive tendency. Alternatively, because of the recent Westernization of Chinese culture (e.g., economic development, urbanization, increases in formal education) (see Pingali, 2006; Wu, 2009; Zeng & Greenfield, 2015), there might be no differences between Chinese and U.S. participants. To test for cross-cultural differences, we compared the data collected by Roberts et al. (2016), which were collected in the midwestern United States during the spring of 2015, with the data from the current research, which were collected in China during the spring and summer of 2016.

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

Method

Participants

In the People's Republic of China, four age groups of participants were included (N = 172): 36 4- to 6-year-olds (39% female; M_{age} = 4 years 8 months, range = 4 years 1 month to 6 years 10 months), 37 7- to 9-year-olds (51% female; M_{age} = 8 years 5 months, range = 7 years 2 months to 9 years 11 months), 48 10- to 13-year-olds (56% female; M_{age} = 11 years, range = 10 years to 13 years 9 months), and 51 adults (49% female; M_{age} = 24 years, range = 18–40). All participants were recruited and tested by the second author. Children of the 4- to 6-year age group were recruited and tested in a kindergarten, and children of other age groups were recruited and tested in an elementary school; both were located in a southwestern county in the Hubei Province of Central China, which has a population of approximately 500,000 residents; the Hubei Province is demographically 96% ethnic Han Chinese. Non-parent adults were recruited and tested at local cafés in a metropolis near the city as well as by word of mouth. In school all children spoke Standard Mandarin Chinese, but at home most of them spoke a local dialect of Mandarin Chinese.

Materials and procedure

The method was adapted from previous research (Roberts et al., 2016) and presented via Qualtrics software. The materials used in Roberts et al. (2016) were translated from English into Chinese by the second author and then back-translated by one bilingual researcher to verify accuracy. First, participants were introduced to cartoon drawings of novel groups, "希博" (i.e., Hibbles) and "格里克" (i.e., Glerks), and were told, "I'm going to tell you about two kinds of groups. This group [*pointing*] is called Hibbles, and this group [*pointing*] is called Glerks." Group membership was portrayed by clothing pattern (green stripes or orange triangles) and category labels (Hibbles or Glerks), and each group consisted of three individuals located on one side of the screen (left or right). Following the introduction of the novel groups, participants were given eight test trials presented in random order. Half of the trials depicted a non-conforming individual, and the other half depicted a conforming individual. Across the eight trials, there were four behavioral domains: music, food, games, and language, with each behavior corresponding to the group in color (e.g., orange clothing pattern corresponded with an orange musical note, orange berries, an orange boomerang-shaped toy, and orange words in a foreign script within a speech bubble). On each trial, participants were given regularities for both groups and then were shown a conforming or non-conforming individual. For example, "Hibbles listen to this kind of music [*pointing*], and Glerks listen to this kind of music [*pointing*]. Look [*revealing the target*], this Hibble is listening to this [conforming or non-conforming] kind of music [*pointing*]." Participants were first asked to provide an *evaluation* (e.g., "Is it okay or not okay for this Hibble to listen to this kind of music?"). Participants who evaluated a behavior as "not okay" were then asked to provide a *negativity rating;* they were presented a scale with three increasingly unhappy faces and asked, "Is it a little bad, pretty bad, or very, very bad?" (1 = *a little bad,* 2 = *pretty bad,* 3 = *very, very bad*). Lastly, participants were asked to provide an *explanation* of their evaluation (e.g., "Why is it okay/not okay for this Hibble to listen to this kind of music?"). For an example trial in Chinese and in the English translation, see Fig. S1 in the online supplementary material.

Measures and coding

First, we calculated the frequency with which disapproval ("not okay" evaluations) was given for both the conformity and non-conformity trials (potential range for each was 0–4). We focused on the frequency of "not okay" evaluations as the dependent variable, which reflected disapproval, because disapproval was our primary interest and because "okay" and "not okay" evaluations were precise inverses. Second, we calculated the average negativity ratings of participants who evaluated a behavior as "not okay" and were presented with the 3-point negativity scale (potential range was 1–3). Third, participants' explanations were recorded verbatim in Chinese, translated into English

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

by the second author, and coded by two research assistants who were blind to the hypotheses of the study (Cohen's kappa = .81). Disagreements were resolved by discussion.

Using previous research as a theoretical guide (Rhodes, 2014; Roberts et al., 2016), responses were coded into five types: (a) norm based, (b) group based, (c) individual based, (d) similarity based, and (e) other. See Table 1 for a description of the coding scheme. Codes were not mutually exclusive, thereby allowing participants to appeal to multiple explanations within a single response. We then examined within each response type (e.g., approved non-conformity) how often participants provided each particular explanation type (relative to the number of trials a particular response type was given). For example, a child who approved of non-conformity on two trials and gave an individual-based explanation on one of those trials was coded as having given individual-based explanations for approved non-conformity 50% of the time.

For exploratory purposes, parents and adult participants were also given the option of completing a survey (94% response rate) adapted from Feldman (2003) that assessed their views on conformity ($\alpha = .54$), respect for common norms ($\alpha = .51$), and authoritarianism ($\alpha = .35$). Because these measure yielded low reliabilities and were not significantly related to participants' responses, they were not included in the primary analyses. However, we did test whether Chinese parents differed from a sample of U.S. parents in their value for conformity, respect for norms, and authoritarianism and found that the Chinese sample tended to value group norms significantly more highly, consistent with previous research (Markus & Kitayama, 1991; see supplementary material for these data and analyses).

Data analysis plan

The analytical plan was modeled after previous research with the same methodology (Roberts et al., 2016, 2017), which permitted direct comparisons across research reports. Preliminary analyses revealed no significant differences across behavioral domains (i.e., music, food, games, language), and there were no effects on the basis of participant sex. Therefore, data were collapsed across these variables. All significant effects and interactions were probed by Bonferroni-corrected planned comparisons ($p < .05$).

First, to test whether children would be more disapproving toward non-conformity or conformity (H1), and whether rates of disapproval declined at each age group (H2), we conducted a 4 (Age Group: 4–6 years, 7–9 years, 10–13 years, or adult) × 2 (Behavior: non-conformity or conformity) repeated-measures analysis of variance (ANOVA) (see Fig. 1 for a graphical representation of these data). Age group was a between-participants variable, behavior was the within-participants variable, and the frequency of "not okay" evaluations was the dependent variable (scores could range from 0 to 4, with higher scores indicating greater disapproval). For additional insight into these data, we conducted

Table 1
Description of the coding scheme.

Code	Description	Examples
Norm	Explicitly mentions that there is a rule or an obligation that the individual must adhere to	"They are supposed to listen to that kind of music." "They have to eat that kind of berry." "They aren't allowed to do that."
Group	References the categories or the group labels	"Because that's just what Hibbles do." "Because it's a Glerk." "Because that's what the rest of the group does."
Individual	References the mental states, including thoughts, emotions, motivations, and traits, or refers to individuals. States that the behavior is about personal choice rather than about group membership	"They can do whatever they feel like." "He can do that if he wants to or feels like it." "Different people like different things."
Similarity	Mentions similar or dissimilar physical appearances	"Because they are green." "Because it looks like that one." "Green things go together."
Other	Gives an explanation that does not fit the others' codes	"Because I think so." "I don't like them."

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

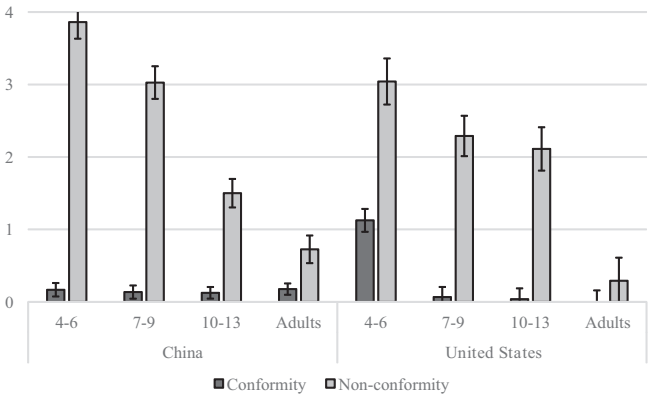

Fig. 1. Mean frequency of disapproval of conformity and non-conformity across age groups and country. Scores could range from 0 to 4. Bars depict standard errors.

Table 2
Means, standard errors, and one-sample *t*-test statistics comparing average disapproval frequencies against chance (i.e., 2) across age groups and behavior type.

Age	Behavior	*M* (*SE*)	*t*	*p*	*d*
4–6 years	Non-conformity	3.86 (0.11)	16.36	<.001	2.72
	Conformity	0.17 (0.09)	−19.62	<.001	3.27
7–9 years	Non-conformity	3.03 (0.27)	3.85	<.001	0.63
	Conformity	0.14 (0.09)	21.18	<.001	3.45
10–13 years	Non-conformity	1.50 (0.23)	−2.17	.035	0.33
	Conformity	0.13 (0.05)	−38.87	<.001	5.61
Adults	Non-conformity	0.73 (0.18)	−7.10	<.001	0.99
	Conformity	0.18 (0.10)	−18.27	<.001	2.56

one-sample *t* tests comparing responses with chance (see Table 2) as well as non-parametric Wilcoxon signed-ranks tests comparing the number of children who approved versus disapproved of non-conforming (or conforming) behaviors the majority of the time (e.g., number of 4- to 6-year-olds approving of conforming behaviors in three or four trials vs. number of children disapproving of the same behaviors in three or four trials; see Table 3). Second, to examine how negatively participants rated the behaviors they disapproved of, we conducted a univariate ANOVA with age group (4: 4–6 years, 7–9 years, 10–13 years, or adult) as the between-participants variable and negativity as the dependent variable (i.e., average across non-conformity trials on which children indicated "not okay"; scores could range from 1 to 3, where higher scores indicate greater disapproval).

Third, we analyzed the explanations (i.e., the percentage of times each explanation type was provided out of the total number of trials for each response type) that participants provided after they were asked why they approved or disapproved of a given behavior (e.g., "Why is it not okay for this Hibble to listen to this kind of music?"). Because participants rarely disapproved of conformity, we did not examine explanations for this response type. Rather, we focused on explanations for disapproved non-conformity, approved non-conformity, and approved conformity. We were particularly interested in the extent to which children appealed to norm-based explanations when disapproving of non-conformity (H1). We did not statistically compare across the response types because not all participants provided each type of response (e.g., a participant could have approved of all behaviors). Therefore, we examined within each response type (e.g., disapproved non-conformity) the frequency of the four explanation types (i.e., norm based, group based, individual based, similarity based). To do this, we conducted a series of repeated-measures ANOVAs with age group as a between-participants

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

Table 3
Non-parametric Wilcoxon signed-rank tests across age groups and behaviors, indicating how many Chinese children most often approved (okay), most often disapproved (not okay), or approved and disapproved equally (tie).

Age	Behavior	Okay	Not okay	Tie	*Z*	*p*	*r*
4–6 years	Non-conformity	1	35	0	5.84	<.001	.97
	Conformity	32	4	0	5.01	<.001	.84
7–9 years	Non-conformity	7	30	0	3.31	<.001	.55
	Conformity	34	3	0	5.21	<.001	.86
10–13 years	Non-conformity	29	19	0	1.96	.005	.28
	Conformity	42	6	0	6.36	<.001	.92
Adults	Non-conformity	34	17	0	1.99	.047	.29
	Conformity	47	4	0	5.82	<.001	.82

Table 4
Percentage of explanation types for each behavior across evaluation types and age groups.

Behavior	Evaluation	Age	*n*	Percentage of explanation types [*M* (*SE*)]			
				Norm	Group	Individual	Similarity
Non-conformity	Not okay	4–6 years	35	57.1 (5.4)	45 (7.4)	0	64.3 (7.2)
		7–9 years	30	23.6 (5.9)	52.5 (8.0)	5.8 (3.9)	44.2 (7.8)
		10–13 years	29	20.4 (6.0)	59.2 (8.2)	14.1 (4.0)	44.3 (7.9)
		Adult	17	4.4 (7.8)	42.6 (10.7)	5.9 (5.2)	23.5 (10.4)
Non-conformity	Okay	4–6 years	2	12.5 (12.2)	25.0 (21.2)	12.5 (24.4)	12.5 (10.5)
		7–9 years	10	2.5 (5.5)	28.3 (9.5)	70.8 (10.9)	13.3 (4.7)
		10–13 years	38	11.6 (2.8)	23.7 (4.9)	54.4 (5.6)	3.3 (2.4)
		Adult	46	4.3 (2.6)	15.8 (4.4)	43.1 (5.1)	8.3 (2.2)
Conformity	Okay	4–6 years	36	3.0 (2.2)	51.6 (6.3)	4.2 (4.7)	71.5 (6.3)
		7–9 years	37	6.1 (2.2)	57.2 (6.2)	12.2 (4.6)	40.8 (6.2)
		10–13 years	48	8.2 (1.9)	42.9 (5.5)	28.3 (4.0)	27.8 (5.4)
		Adult	50	5.5 (1.9)	23.0 (5.4)	26.0 (4.0)	20.5 (5.3)

Note. Scores represent each type of explanation out of the total number of trials. Across studies, individual explanations could have been coded as of more than one type, and explanations that did not fit any of the codes are not reported (thereby explaining why the percentages add to more than or less than 100). Because participants rarely disapproved of conformity, data for this response type are not presented.

variable, explanation type as a within-participants variable, and the percentage of given explanations as the dependent variable. We used the Huynh–Feldt correction to adjust the degrees of freedom for the calculated *F* values (Field, 2011; Huynh & Feldt, 1976) because the explanation data violated the repeated-measures assumption of sphericity. Refer to Table 4 for the explanation data.

Results

Disapproval toward conformity and non-conformity

There were significant main effects of age group, $F(3, 168) = 39.63$, $p < .001$, $\eta_p^2 = .41$, and behavior, $F(1, 168) = 346.13$, $p < .001$, $\eta_p^2 = .67$, and a significant interaction of age group and behavior, $F(3, 168) = 39.20$, $p < .001$, $\eta_p^2 = .41$. Consistent with our first hypothesis, all age groups were significantly more disapproving of non-conformity than of conformity ($ps \leq .009$), and consistent with our second hypothesis, disapproval toward non-conformity decreased at each age group ($ps \leq .032$), although the difference between 4- to 6-year-olds and 7- to 9-year-olds was non-significant ($p = .059$).

Negativity toward non-conformity

Focusing only on participants who disapproved of non-conformity and were subsequently asked how bad the behavior was (35 4- to 6-year-olds, 30 7- to 9-year-olds, 29 10- to 13-year-olds, and

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

17 adults), we found a main effect of age group, $F(3, 107) = 10.38$, $p < .001$, $\eta_p^2 = .23$. Both 4- to 6-year-olds ($M = 2.19$, $SE = 0.11$) and 7- to 9-year-olds ($M = 2.01$, $SE = .12$) were significantly more negative than 10- to 13-year-olds ($M = 1.41$, $SE = 0.12$) and adults ($M = 1.49$, $SE = .16$) ($ps \leq .05$). The two youngest age groups did not differ significantly, nor did the two oldest age groups ($ps = 1.00$).

Explanations

Explanations about disapproved non-conformity

Focusing on participants who disapproved of non-conformity ($n = 111$), there were significant main effects of explanation type, $F(2.60, 278.30) = 27.52$, $p < .001$, $\eta_p^2 = .21$, and age group, $F(3, 107) = 8.32$, $p < .001$, $\eta_p^2 = .19$, and a significant interaction of explanation and age group, $F(7.79, 8.89) = 3.56$, $p = .001$, $\eta_p^2 = .09$. The 4- to 6-year-olds gave mostly similarity-based and norm-based explanations, the 7- to 9-year-olds and 10- to 13-year-olds gave mostly similarity-based and group-based explanations, and the adults gave mostly group-based explanations. Together, these data indicate that when disapproving of non-conformity, younger children appealed to normative explanations (consistent with H1), whereas older children focused more on group-based explanations.

Explanations about approved non-conformity

Few 4- to 6-year-olds ($n = 2$) and 7- to 9-year-olds ($n = 10$) approved of non-conformity, so these age groups were excluded from this analysis. Thus, focusing on 10- to 13-year-olds ($n = 38$) and adults ($n = 46$) who approved of non-conformity, there were significant main effects of explanation type, $F(2.42, 198.08) = 42.80$, $p < .001$, $\eta_p^2 = .34$, and age group, $F(1, 82) = 6.02$, $p = .016$, $\eta_p^2 = .07$. Overall, both age groups gave mostly individual-based explanations when approving of non-conformity, with 10- to 13-year-olds overall giving more of each explanation type than adults (with the exception of similarity-based explanations).

Explanations about approved conformity

Focusing on participants who approved of conformity ($n = 171$), there was a main effect of explanation type, $F(2.52, 420.32) = 51.38$, $p < .001$, $\eta_p^2 = .24$, and age group, $F(3, 167) = 10.21$, $p < .001$, $\eta_p^2 = .16$, and a significant interaction of explanation type and age group, $F(7.55, 420.32) = 9.25$, $p < .001$, $\eta_p^2 = .14$. Children gave mostly group-based explanations, whereas adults gave mostly group-based, individual-based, and similarity-based explanations.

Secondary data analysis (China vs. United States)

We next compared the data derived from the current research with those derived from Roberts et al. (2016, Study 1). The data analysis plan paralleled that of the main study, with the addition of "country" as a between-participants variable. We report only the effects involving country because cross-cultural differences were our a priori interest (Bonferroni corrected at the $p < .05$ level).

Disapproval toward conformity and non-conformity

We found main effects of behavior and age group, a significant interaction of behavior and country, $F(1, 272) = 6.33$, $p = .012$, $\eta_p^2 = .02$, and a significant interaction of age group, behavior, and country, $F(3, 272) = 6.53$, $p < .001$, $\eta_p^2 = .07$. Consistent with our third hypothesis (H3), Chinese 4- to 6-year-olds rated non-conformity more disapprovingly than same-aged U.S. children ($p = .042$), and they rated conformity less disapprovingly than same-aged U.S. children ($p < .001$). Rates of disapproval did not differ between countries at any other age group for ratings of non-conformity or conformity ($ps > .072$).

Negativity toward non-conformity

We next focused only on children who disapproved of non-conformity ($n = 156$) and were subsequently asked how bad the behavior was (only 4 U.S. adults disapproved of non-conformity, so we excluded adults from this analysis) and did not find any significant effects involving country

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

(*ps* > .10). Interestingly, this suggests that although Chinese children were more disapproving than U.S. children, those who were disapproving were not more negative.

Explanations about disapproved non-conformity

Focusing on children who disapproved of non-conformity (n = 156), we found a significant effect of country, $F(2, 150) = 30.54$, $p < .001$, $\eta = .07$, and a significant interaction between explanation type and country, $F(2.66, 399.65) = 5.33$, $p = .002$, $\eta = .03$. Consistent with our third prediction, overall, Chinese children provided more norm-based and similarity-based explanations than U.S. children (*ps* < .02).

Explanations about approved non-conformity

Because younger Chinese children rarely approved of non-conformity, we focused only on 10- to 13-year-olds and adults (n = 127), although this analysis yielded no significant effects on the basis of country (*ps* > .072).

Explanations about approved conformity

Focusing on children who approved of conformity (n = 275), we found a significant effect of country, $F(1, 267) = 11.85$, $p = .001$, $\eta < .04$, a significant interaction of age group and country, $F(1, 267) = 6.77$, $p < .001$, $\eta = .07$, a significant interaction of explanation type and country, $F(2.75, 733.01) = 11.20$, $p < .001$, $\eta = .04$, and a significant interaction of explanation type, age group, and country, $F(8.23, 733.01) = 3.35$, $p = .001$, $\eta = .04$. All Chinese participant groups gave more similarity-based explanations than U.S. participant groups ($ps \leq .042$). Chinese 4- to 6-year-olds gave more group-based explanations, but fewer norm-based explanations, compared with same-aged U.S. children ($ps \leq .004$).

Discussion

The current results indicate that children's descriptive-to-prescriptive tendency replicates cross-culturally. More specifically, consistent with research with same-aged U.S. children (Roberts et al., 2016), and consistent with our first hypothesis, Chinese children disapproved of non-conformity, rated it negatively, and provided norm-based explanations when justifying their evaluations (e.g., if Hibbles were characterized as listening to a specific kind of music, individual Hibbles *should* listen to that kind of music and it was bad if they did not). These data are consistent with the proposal that a preference for normative conformity is deeply rooted in our evolutionary history (Chudek & Henrich, 2011; Tomasello, 2016), likely as a result of the central role that group-based living played throughout human history (e.g., conforming to group norms enhanced the functionality, resources, and survival of the self and the group). In addition, again replicating previous research, Chinese children's descriptive-to-prescriptive tendency declined at each age group (i.e., regarding non-conformity, the youngest age groups were most likely to disapprove, show negativity, and provide norm-based explanations), which aligns with our second hypothesis and previous research suggesting that Chinese children (like U.S. children) become more sensitive to individual differences with age (Wang, 2004). Of course, additional work is needed to examine these questions with a broader range of cultural contexts, but for now the findings provide empirical evidence that children from two distinct cultural contexts interpret descriptive group regularities as having prescriptive force.

Critically, however, the strength of this tendency varied cross-culturally (consistent with our third hypothesis). Compared with same-aged U.S. children, Chinese 4- to 6-year-olds evaluated non-conformity more disapprovingly (and evaluated conformity more approvingly), and across all child groups Chinese children provided more norm-based explanations when justifying their disapproval. In addition, unlike U.S. adults in previous research, Chinese adults in the current research were more disapproving of non-conformity than of conformity. This finding was especially interesting given that the task was explicit and involved novel groups engaged in morally neutral behaviors, suggesting that even under such circumstances Chinese adults show a descriptive-to-prescriptive tendency. Taken together, these data are consistent with the reasoning that individuals from cultures that value interdependence more highly may be more likely to use group regularities to disapprove of non-conformity

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

(because doing so privileges group functioning over individual functioning). Thus, the current data provide evidence that although the descriptive-to-prescriptive tendency replicates across cultures, the degree of it might not.

One important question for future research is to explore precisely why prescriptiveness declined with age, which was especially notable given the literature suggesting that there is greater value placed on interdependence in China than in the United States (e.g., Markus & Kitayama, 1991) and given the alternative prediction that children in more interdependent cultures would be increasingly prescriptive with age as a function of their socialization experiences. One possibility is that older Chinese children were better than their younger peers at suppressing and overriding their responses on this explicit task. Indeed, U.S. data on racial attitudes suggests that whereas explicit biases decline with age, implicit biases often persist (e.g., Apfelbaum, Pauker, Ambady, Sommers, & Norton, 2008; Baron & Banaji, 2006). Thus, future research should test whether or not older children and adults make prescriptive judgments at an implicit level. A second possibility is that because the current task provided a particularly strong test of attention to conformity (given the novel categories and innocuous behaviors), older children and adults may have required additional information or more consequential behaviors (e.g., where failure to conform has more overt consequences for the group). Under conditions with more severe acts of non-conformity, older children and adults may indeed show a descriptive-to-prescriptive tendency even on an explicit task such as this. A third possibility is that older children were more aware of individual differences, thereby making them more likely to reason that different people simply like different things (see Quintana, 1998). The explanation data align with this last interpretation; when 10- to 13-year-olds approved of non-conformity, they most often appealed to individual-based explanations (e.g., "Everyone has their own thoughts, [and] playing with a toy is part of one's own thoughts. There should be no limit on that"). If this was indeed the case, future research should test whether encouraging children, especially younger children, to think about individual differences reduces their descriptive-to-prescriptive tendency.

Importantly, we acknowledge that there exists much variation within cultures. Certainly, a variety of factors are likely to influence a child's attention to group norms, whether in the United States or in China (e.g., rural vs. urban, liberal vs. conservative, part of a majority vs. part of a minority), and thus are likely to influence their acceptance of non-conformity (for data on variation in social group concepts, see Rhodes & Gelman, 2009, for context-based variation and Roberts & Gelman, 2016, for group membership-based variation). We look forward to future research that explores within-culture variation more systematically because doing so would provide a richer and more nuanced understanding of the effects detected here. (See also Talhelm et al., 2014, for a description of differences in interdependence within China as a function of rice vs. wheat farming. Notably, the Hubei Province studied here is one of the provinces that Talhelm et al. identified as relatively interdependent.) For now, however, the current research documents that children's descriptive-to-prescriptive tendency both replicates and varies cross-culturally.

Lastly, an important issue is the extent to which the current findings with novel groups to which children did not belong would extend to real-life settings. Certainly, children have learned to associate stereotypical features with a variety of social groups. For example, English children report that English soccer fans are friendly (Abrams, Rutland, Pelletier, & Ferrell, 2009), U.S. children report that boys play with toy trucks (Taylor, Rhodes, & Gelman, 2009), Israeli children report that Arabic people wear scarves (Barrett, 1996), and South African children report that White people are wealthy (Olson, Shutts, Kinzler, & Weisman, 2012). Children's descriptive-to-prescriptive tendency, augmented by years of real-world experiences (e.g., socialization, group membership, moral concerns), may lead to the inference that English soccer fans *should be* friendly, boys *should* play with toy trucks, Arabic people *should* wear scarves, and White people *should be* wealthy. Thus, the early emergence and pervasiveness of stereotype development may be firmly rooted in children's reasoning about social group norms, and the current data suggest that this reasoning replicates (and varies) cross-culturally.

Acknowledgments

This research was supported by a National Science Foundation Graduate Research Fellowship and a Ford Foundation Predoctoral Research Fellowship to Steven O. Roberts and by a National Institute of

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

Child Health and Human Development grant (HD-36043) to Susan A. Gelman. We thank the participants as well as Melissa Granville and Hyeongjun "Jack" Kim for assistance with data coding. We thank Craig Smith and the Living Laboratory at the University of Michigan. We are especially grateful to Wylie Wan and Min Zou for their assistance.

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jecp.2017.03.018.

References

Abrams, D., Rutland, A., Pelletier, J., & Ferrell, J. M. (2009). Children's group nous: Understanding and applying peer exclusion within and between groups. *Child Development, 80*, 224–243.

Apfelbaum, E. P., Pauker, K., Ambady, N., Sommers, S. R., & Norton, M. I. (2008). Learning (not) to talk about race: When older children underperform in social categorization. *Developmental Psychology, 44*, 1513–1518.

Baron, A. S., & Banaji, M. R. (2006). The development of implicit attitudes: Evidence of race evaluations from ages 6 and 10 and adulthood. *Psychological Science, 17*, 53–58.

Barrett, M. (1996). Development of social categories and stereotypes in early childhood: The case of "the Arab" concept formation, stereotype, and attitudes by Jewish children in Israel. *International Journal of Intercultural Relations, 20*, 341–370.

Berl, R. E. W., & Hewlett, B. S. (2015). Cultural variation in the use of overimitation by the Aka and Nganda of the Congo Basin. *PLoS ONE, 10*(3), e0120180.

Bigler, R. S., & Liben, L. S. (2006). A developmental intergroup theory of social stereotypes and prejudice. In R. V. Kail (Ed.). *Advances in child development and behavior* (Vol. 34, pp. 39–89). San Diego: Elsevier.

Chudek, M., & Henrich, J. (2011). Culture-gene coevolution, norm-psychology and the emergence of human prosociality. *Trends in Cognitive Sciences, 15*, 218–226. http://dx.doi.org/10.1016/j.tics.2011.03.003.

Clegg, J. M., & Legare, C. H. (2016). A cross-cultural comparison of children's imitative flexibility. *Developmental Psychology, 52*, 1435–1444.

Cooley, S., & Killen, M. (2015). Children's evaluations of resource allocation in the context of group norms. *Developmental Psychology, 51*, 554–563.

Feldman, S. (2003). Social conformity: A theory enforcing of authoritarianism. *Political Psychology, 24*, 41–74.

Field, A. (2011). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage.

Fu, G., Xu, F., Cameron, C. A., Heyman, G. D., & Lee, K. (2007). Cross-cultural differences in children's choices, categorizations, and evaluations of truths and lies. *Developmental Psychology, 43*, 278–293.

Göckeritz, S., Schmidt, M. F. H., & Tomasello, M. (2014). Young children's creation and transmission of social norms. *Cognitive Development, 30*, 81–95.

Hardecker, S., Schmidt, M. F. H., Roden, M., & Tomasello, M. (2016). Young children's behavioral and emotional responses to different social norm violations. *Journal of Experimental Child Psychology, 150*, 364–379.

Hart, D., & Edelstein, W. (1992). Self-understanding development in cross-cultural perspective. In T. M. Brinthaupt & R. P. Lipka (Eds.), *The self: Definitional and methodological issues* (pp. 291–322). Albany: State University of New York Press.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*, 61–135.

Horner, V., & Whiten, A. (2005). Causal knowledge and imitation/emulation switching in chimpanzees (*Pan troglodytes*) and children (*Homo sapiens*). *Animal Cognition, 8*, 164–181.

Huynh, H., & Feldt, L. S. (1976). Estimation of the Box correction for degrees of freedom from sample data in randomized block and split-plot designs. *Journal of Educational Statistics, 1*, 69–82.

Josephs, M., Kushnir, T., Gräfenhain, M., & Rakoczy, H. (2016). Children protest moral and conventional violations more when they believe actions are freely chosen. *Journal of Experimental Child Psychology, 141*, 247–255.

Kenward, B. (2012). Over-imitating preschoolers believe unnecessary actions are normative and enforce their performance by a third party. *Journal of Experimental Child Psychology, 112*, 195–207.

Legare, C. H., & Harris, P. L. (2016). The ontogeny of cultural learning. *Child Development, 87*, 633–642.

Li, J., & Wang, Q. (2004). Perceptions of achievement and achieving peers in U.S. and Chinese kindergartners. *Social Development, 13*, 413–436.

Little, E. E., Carver, L. J., & Legare, C. H. (2016). Cultural variation in triadic infant–caregiver object exploration. *Child Development, 87*, 1130–1145.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224–253.

Mu, Y., Kitayama, S., Han, S., & Gelfand, M. J. (2015). How culture gets embrained: Cultural differences in event-related potentials of social norm violations. *Proceedings of the National Academy of Sciences of the United States of America, 112*, 15348–15353.

Nielsen, M., & Mushin, I. (2014). Where culture takes hold: "Overimitation" and its flexible deployment in Western, Aboriginal, and Bushmen children. *Child Development, 85*, 2169–2184.

Nielsen, M., & Tomaselli, K. (2010). Overimitation in Kalahari Bushman children and the origins of human cultural cognition. *Psychological Science, 21*, 729–736.

Olson, K. R., Shutts, K., Kinzler, K. D., & Weisman, K. G. (2012). Children associate racial groups with wealth: Evidence from South Africa. *Child Development, 83*, 1884–1899.

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018

Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*, 3–72.
Pingali, P. (2006). Westernization of Asian diets and the transformation of food systems: Implications for research and policy. *Food Policy, 32*, 281–298.
Quintana, S. M. (1998). Children's developmental understanding of ethnicity and race. *Applied and Preventive Psychology, 7*, 27–45.
Rakoczy, H., Hamann, K., Warneken, F., & Tomasello, M. (2010). Bigger knows better: Young children selectively learn rule games from adults rather than from peers. *British Journal of Developmental Psychology, 28*, 785–798.
Rakoczy, H., & Schmidt, M. F. H. (2013). The early ontogeny of social norms. *Child Development Perspectives, 7*, 17–21.
Rakoczy, H., Warneken, F., & Tomasello, M. (2008). The sources of normativity: Young children's awareness of the normative structure of games. *Developmental Psychology, 44*, 875–881.
Rhodes, M. (2014). Children's explanations as a window into their intuitive theories of the social world. *Cognitive Science, 38*, 1687–1697.
Rhodes, M., & Gelman, S. A. (2009). A developmental examination of the conceptual structure of animal, artifact, and human social categories across two cultural contexts. *Cognitive Psychology, 59*, 244–274.
Rhodes, M., Leslie, S. J., & Tworek, C. M. (2012). Cultural transmission of social essentialism. *Proceedings of the National Academy of Sciences of the United States of America, 109*, 13526–13531.
Riggs, A. E., & Young, A. G. (2016). Developmental changes in children's normative reasoning across learning contexts and collaborative roles. *Developmental Psychology, 62*, 1236–1246.
Roberts, S. O., & Gelman, S. A. (2015). Do children see in Black and White? Children's and adults' categorizations of multiracial individuals. *Child Development, 86*, 1830–1847.
Roberts, S. O., & Gelman, S. A. (2016). Can White children grow up to be Black? Children's reasoning about the stability of emotion and race. *Developmental Psychology, 52*, 887–893.
Roberts, S. O., Gelman, S. A., & Ho, A. K. (2016). So it is, so it shall be: Group regularities license children's prescriptive judgments. *Cognitive Science*. http://dx.doi.org/10.1111/cogs.12443. Advance online publication.
Roberts, S. O., Ho, A. K., & Gelman, S. A. (2017). Group presence, category labels, and generic statements influence children to treat descriptive group regularities as prescriptive. *Journal of Experimental Child Psychology, 158*, 19–31.
Samland, J., Josephs, M., Waldmann, M. R., & Rakoczy, H. (2016). The role of prescriptive norms and knowledge in children's and adults' causal selection. *Journal of Experimental Psychology: General, 145*, 125–130.
Schmidt, M. F. H., Butler, L. P., Heinz, J., & Tomasello, M. (2016). Young children see a single action and infer a social norm. *Psychological Science, 27*, 1360–1370.
Schmidt, M. F. H., Hardecker, S., & Tomasello, M. (2016). Preschoolers understand the normativity of cooperatively structured competition. *Journal of Experimental Child Psychology, 143*, 34–47.
Schmidt, M. F. H., Rakoczy, H., & Tomasello, M. (2011). Young children attribute normativity to novel actions without pedagogy or normative language. *Developmental Science, 14*, 530–539.
Strachan, J., Samuel, J., & Takaro, M. (2007). Ni Vanuatu women graduates: What happens when they go home? *Development in Practice, 17*, 147–153.
Talhelm, T., Zhang, X., Oishi, S., Shimin, C., Duan, D., Lan, X., & Kitayama, S. (2014). Large-scale psychological rice versus wheat agriculture. *Science, 344*, 603–608.
Taylor, M. G., Rhodes, M., & Gelman, S. A. (2009). Boys will be boys; Cows will be cows: Children's essentialist reasoning about gender categories and animal species. *Child Development, 80*, 461–481.
Tomasello, M. (2016). Cultural learning redux. *Child Development, 87*, 643–653.
Vaish, A., Herrmann, E., Markmann, C., & Tomasello, M. (2016). Preschoolers value those who sanction non-cooperators. *Cognition, 153*, 43–51.
Wang, Q. (2001). Culture effects on adults' earliest childhood recollection and self-description: Implications for the relation between memory and the self. *Journal of Personality and Social Psychology, 81*, 220–233.
Wang, Q. (2004). The emergence of cultural self-constructs: Autobiographical memory and self-description in European American and Chinese children. *Developmental Psychology, 40*, 3–15.
Wang, Q., Leichtman, M. D., & Davies, K. (2000). Sharing memories and telling stories: American and Chinese mothers and their 3-year-olds. *Memory, 8*, 159–177.
Waxman (2010). Names will never hurt me? Naming and the development of racial and gender categories in preschool-aged children. *European Journal of Social Psychology, 40*, 593–610. http://dx.doi.org/10.1002/ejsp.732.
Wu, M. (2009). The transformation of the educational semantic within a changing society: A study of the Westernization of modern Chinese education. *Journal of Historical Sociology, 22*, 528–552.
Zeng, R., & Greenfield, P. M. (2015). Cultural evolution over the last 40 years in China: Using the Google Ngram Viewer to study implications of social and political change for cultural values. *International Journal of Psychology, 50*, 47–55.

Please cite this article in press as: Roberts, S. O., et al. Children's descriptive-to-prescriptive tendency replicates (and varies) cross-culturally: Evidence from China. *Journal of Experimental Child Psychology* (2017), http://dx.doi.org/10.1016/j.jecp.2017.03.018