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Brief Report

Teaching versus enforcing game rules in preschoolers' peer interactions

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ABSTRACT

Children use normative language in two key contexts: when teaching others and when enforcing social norms. We presented pairs of 3- and 5-year-old peers ($N = 192$) with a sorting game in two experimental conditions (in addition to a third baseline condition). In the teaching condition, one child was knowledgeable, whereas the other child was ignorant and so in need of instruction. In the enforcement condition, children learned conflicting rules so that each child was making mistakes from the other's point of view. When teaching rules to an ignorant partner, both age groups used generic normative language ("Bunnies go here"). When enforcing rules on a rule-breaking partner, 3-year-olds used normative utterances that were not generic and aimed at correcting individual behavior ("No, this goes there"), whereas 5-year-olds again used generic normative language, perhaps because they discerned that instruction was needed in this case as well. Young children normatively correct peers differently depending on their assessment of what their wayward partners need to bring them back into line.

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Introduction

Human societies depend on the transmission and enforcement of social norms and rules. By 3 years of age, children already know a lot about how norms and rules work (Rakoczy & Schmidt, 2013; Schmidt & Tomasello, 2012; Smetana, 2006; Turiel, 1983).

Children's normative understanding has been mostly investigated through how they judge norm violations. Some studies, using interview methods, have presented children with scenarios in which hypothetical characters commit various norm violations. The converging evidence suggests that by 3 or 4 years of age, children differentiate moral norm violations (e.g., hurting someone) from conventional norm violations (e.g., wearing pajamas to school) and treat the latter as less serious, less punishable, and more context dependent (Smetana, 1981; Turiel, 1983).

Another set of studies tested children's understanding of the normative force of social norms by investigating children's interventions in third-party norm violations. Recent experimental studies had children witness a puppet violating a rule within rule-governed games (Rakoczy, Warneken, & Tomasello, 2008; Schmidt, Rakoczy, & Tomasello, 2011, 2012). The results showed that 3-year-olds, and 2-year-olds to some extent, protested against the mistakes of the puppet, using normative language such as "No! It does not go like this!" (Rakoczy et al., 2008, p. 877). Moreover, children were selective in their norm enforcement and appreciated that conventional norms are context dependent and shared among a group of people. Schmidt and colleagues (2012) found that 3-year-olds protested against conventional norm violations of in-group members but not of out-group members who do not fall within the scope of these norms, appreciating that conventional norms are binding for in-group members only.

While enforcing rules, children not only protest the actions of the transgressors but also tend to *teach* them the correct way by stating the normative rule (Rakoczy et al., 2008; Schmidt et al., 2011). For instance, in their naturalistic interactions, children were observed to respond to peers' conventional transgressions through stating and teaching the normative rule, for example, "You are not supposed to spit" (Nucci & Nucci, 1982, p. 1339). In another study, when pairs of preschool peers were presented with conflicting instructions for a sorting game (one child was instructed to sort the items by color, whereas the other child was instructed to sort them by shape), children displayed normative protests and corrected their peers' actions through appealing to the rule, for example, "No, green comes with green" (Köymen et al., 2014, p. 1112).

However, in the studies analyzing children's normative protests, enforcing rules versus teaching rules were often conflated and not adequately differentiated. Köymen and colleagues (2014) only investigated children's use of normative language while enforcing game rules (witnessing a peer's rule violation). One important question that remains is how children's communicative strategies (e.g., their use of normative language) differ between correcting the action of a peer who knowingly violates the game rules versus teaching a naive peer who does not know the game rules. When witnessing the rule violation of a person who is familiar with the game, one might remind that person of the rule through relying on common ground. Saying "This goes here" or "You must put it there" would be sufficient. On the other hand, when teaching the same rule to a naive person, one cannot rely on such common ground; therefore, the normative language needs to become more informative, for instance, become more generic. Generic normative language explicitly spells out the necessary information about the general rule without specific individual references. For instance, in the context of the sorting game, generic normative language could be exemplified as "Green objects go here" or "One must put the green objects here."

In fact, in pedagogical contexts, where children pretended to be teachers talking to novices, 5-year-olds were observed to use generic statements (Gelman, Ware, Manczak, & Graham, 2013; see also Gelman, Chesnick, & Waxman, 2005). Similarly, 5-year-olds, while passing on game rules to their novice peers, were observed to use generic normative language (Göckeritz, Schmidt, & Tomasello, 2014). Generic normative language is not only more informative but also highlights the generality and agent neutrality of game rules that bind all individuals playing this game (Rakoczy & Schmidt, 2013; Schmidt & Tomasello, 2012). In the case of the sorting game, the rule is not about this particular green object but rather applies to all other green objects that need to be grouped together. Similarly, not just Person X but anyone who plays this game needs to put the green objects there.

To investigate children's communicative strategies about game rules, particularly their use of normative language, we created two experimental conditions in which children would enforce or teach game rules to a peer and a third baseline condition in which children would not need to teach or enforce game rules. In the *enforcement* condition, we modified the procedure of Köymen and colleagues (2014). Pairs of children watched a video clip about a sorting game (a hand sorting cards) on their separate laptops simultaneously. The two children assumed that they were watching the same clip, but they received conflicting information; one watched a clip in which the cards were sorted by geometric shape, whereas the other watched a clip in which the cards were sorted by animal shape. While playing this game with a peer later on, each child witnessed the peer violating the game rule from his or her perspective. In the *teaching* condition, one child watched a clip from a laptop while the other child was drawing a picture, so the child who watched the clip knew that the peer did not know this game and needed to be taught. In the *baseline* condition, both children watched the same clip on their laptops such that they shared a common ground about the game, as in the enforcement context, but this time did not need to teach or enforce rules when they played the game together because they could rely on this common ground of watching the same clip.

We then analyzed children's communicative strategies while they were playing the sorting game with a peer. We had different predictions/questions for each of the three conditions. First, in the baseline condition, we predicted that children in both age groups would not systematically prefer generic or nongeneric normative language because they would not need to teach or enforce rules. Second, in the teaching condition, because the rule needs to be taught more generally, we hypothesized that children would use generic normative language and that their generic utterances would more likely to be normative than nonnormative. Although it is well known that preschool children comprehend and use generic statements as general kind-relevant information distinct from individual references (Gelman et al., 2005; Hollander, Gelman, & Star, 2002), we do not yet know whether or how 3-year-olds use this knowledge while teaching game rules to peers. Third, in the enforcement condition, we also explored whether children's normative language changed in terms of genericness, explicitly comparing this with the teaching condition. Studies have suggested that in their protests children tend to teach using normative language (Rakoczy et al., 2008); however, the relative use of generic and nongeneric normative language is not known.

Method

Participants

Participants were 96 3-year-olds (M = 3; 8 [years; months], range = 3; 4–3; 11, 48 girls) and 96 5-year-olds (M = 5; 8, range = 5; 4–5; 11, 48 girls) grouped in 96 dyads matched by gender and age. The dyads were composed of children who were familiar with one another. Within each age group, 16 dyads participated in each of the three conditions. In addition to the 96 dyads, 14 dyads could not be included in the analyses: 11 (4 5-year-old and 7 3-year-old) dyads due to equipment malfunctioning and 3 (3-year-old) dyads due to uncooperativeness. Children were native speakers of German with various socioeconomic backgrounds.

Materials

Labeling game

Each child named four pictures—a duck, a bunny, a star, and a flower that later appeared in the board game—to ensure that children knew the names of the objects on the cards.

Board game

A total of 12 5 × 5-cm cards (in a predetermined order) needed to be placed on a 30.5 × 41-cm board. The cards could be sorted by animal (bunnies and ducks) or shape (stars and flowers). There were four types of cards: a flower with a bunny, a flower with a duck, a star with a bunny, and a star with a duck. On the board, there were two rows. The head of one row had a picture of a flower with a

bunny, and the head of the other row had a picture of a star with a duck, indicating one level of each of the two sorting dimensions.

Clips

There were two video clips (~3 min each) showing a hand sorting the cards by either animal or shape. The animal clip had the image of the experimenter saying, "Pay attention, the board game goes like this. Look!" Then, a hand sorted 12 cards (in a predetermined order) by animal. The voice commented on the first 5 cards, "Duck here, bunny there" to facilitate children's comprehension of the rule without using normative language. The shape clip was the same except that the hand sorted the cards by shape. The voice said, "Star here, flower there" for the first 5 cards.

Procedure

The study took place in preschools in a mid-sized German city. There were two phases: the observation phase and the testing phase (~10 min total). All sessions were videotaped.

In the *baseline* condition, Child A and Child B first played the labeling game with the experimenter. Then in the observation phase, Child A and Child B were seated facing one another. Each had a laptop from which they watched a clip. The experimenter said, "There is a video clip on these laptops about the board game, and let's watch it together." Both children wore headphones and watched the same clip on their laptops. In each age group, 8 dyads watched the animal clip, and the remaining 8 dyads watched the shape clip. Then in the testing phase, the children moved to a second table with the board game and were seated next to one another. In between the children was a box with 12 cards in a predetermined order. The experimenter only said, "You both watched the clip. Now it is your turn with the board game. You play together like in the clip" and left the room without giving any other instructions about how to play the game (e.g., taking turns).

In the *enforcement* condition, the procedure was identical to that in the baseline condition except that Child A watched the animal clip while Child B watched the shape clip, thereby receiving conflicting information.

In the *teaching* condition, the procedure was the same as in the other two conditions except that in the observation phase Child A watched a clip while Child B drew a picture. The experimenter told Child B, "This is for you to draw"; the experimenter told Child A, "There is a clip on this laptop and we will watch it together" and placed the headphones on Child A. In each age group, 8 dyads in the teaching condition watched the animal clip, and the remaining 8 dyads watched the shape clip. In the testing phase, the experimenter said, "[Child A], you saw the clip but you, [Child B], did not. Now it is your turn with the board game, [Child B]. You, [Child A], can tell [Child B] how it was in the clip. You, [Child B], listen to [Child A] carefully."[1]

Coding

Children's conversations in the testing phase were transcribed verbatim. First, we extracted on-task utterances, which were clause-level utterances (utterances with verbs) about the game. The on-task utterances were coded for two categories, each of which had two levels: *normativity* (normative vs. nonnormative) and *genericness* (generic vs. nongeneric).

Normativity

The normative utterances involved children's interventions in their peers' actions (e.g., protesting, teaching) using normative vocabulary. Specifically, the normative utterances could include any of the following:

[1] The instructions emphasized the roles in the teaching condition so that Child A verbally explains the rules to Child B to assess the communicative strategies because piloting suggested that without this emphasis, Child A simply taught the rules nonverbally by sorting the cards.

- reference to the rule using the verbs *kommen* 'come' and *gehören* 'belong' (*Nee, die Sterne kommen doch hier unten* 'No, the stars come down there');
- reference to the rule using deontic modal verbs *müssen* 'must', *sollen* 'ought to', and *dürfen* 'allowed to' (*Die Blume muss doch hier hin* 'The flower must go here');
- normative adjectives or adverbs (*Das ist falsch* 'This is wrong');
- formulaic normative expressions (*Das geht doch nicht* 'It doesn't go like that' and *Wir machen das so* 'We do it like that').

The rest of the utterances were coded as nonnormative.

Genericness

The generic statements revealed kind-relevant information, suggesting that the statements apply to all similar referents. Specifically the generic utterances could include any of the following:

- collective nouns (*die Blumereihe* 'the flower row') or plurals (*Hier kommen die Enten* 'The ducks go here');
- singular nouns with indefinite article (*ein* 'a') (*Eine Ente kommt da* 'A duck goes here');
- singular nouns with definite articles (*die/der/das* 'the') or demonstratives (*es*/*das* 'it/that') that co-occur with the adverbs *immer* 'always' and *wieder* 'again' (*Die Ente muss immer runter* 'The duck must always [go] below');
- the generic nouns above as the objects in the sentences with the verb to be (*Das ist die Hasenreihe* 'This is the bunny row');
- the agent *man* 'one' (*Also das muss man hinlegen* 'So one must place it here').

The rest of the utterances were coded as nongeneric utterances. Table 1 exemplifies the possible combinations of utterances at both levels of normativity and genericness.

A total of 20 dyads (5 3-year-old and 4 5-year-old dyads in the baseline condition; 5 3-year-old and 4 5-year-old dyads in the enforcement condition; and 2 5-year-old dyads in the teaching condition) did not produce any on-task utterances. That is, their task-related utterances included phrases such as *Stern hier* 'Star here' that were not at the clause level and, therefore, could not be coded for normativity or genericness.

A second coder, who was blind to the condition, age group, and predictions, recoded the transcripts from 12 dyads (2 3-year-old and 2 5-year-old dyads from each condition). The agreements on the on-task, normative, and generic utterances were κ = .83, .89, and .79, respectively.

Results

There were a total of 683 on-task utterances from 76 dyads that were used in the statistical analyses. Table 2 shows the means and standard deviations of the types of utterances across age groups and conditions.

Table 1
Examples for the combinations of (non)generic and (non)normative utterances.

	Normativity		
		Normative	Nonnormative
Genericness	Generic	*Die Blumen kommen immer da hin.* The flowers always go there. *Also das muss man hinlegen.* So one must place it here.	*Das ist ein Stern.* That is a star. *Hier ist die Entenreihe.* The duck row is here.
	Nongeneric	*Die Ente kommt hier hin.* The duck comes here. *Das kommt da hin.* It goes there.	*Hier ist der Stern.* The star is here. *Ich brauch einen Stern.* I need a star.

Table 2
Means (and standard deviations) of (non)generic and (non)normative utterances across conditions and age groups.

Utterances	Baseline	Enforcement	Teaching
3-year-olds			
Generic nonnormative	0.36 (0.67)	0.82 (1.60)	0.81 (1.28)
Generic normative	0.09 (0.30)	0.45 (1.04)	1.56 (4.23)
Nongeneric nonnormative	2.27 (1.27)	2.82 (2.96)	9.25 (7.41)
Nongeneric normative	2.36 (2.77)	3.45 (2.02)	3.75 (3.47)
5-year-olds			
Generic nonnormative	0.08 (0.29)	0.00 (0.00)	0.50 (0.94)
Generic normative	0.17 (0.39)	0.50 (1.00)	0.57 (1.02)
Nongeneric nonnormative	3.67 (2.84)	4.33 (3.75)	6.14 (9.35)
Nongeneric normative	2.08 (3.45)	2.25 (1.86)	2.86 (2.63)

We investigated whether the type of normative language that children used changed in terms of genericness across the three conditions using generalized linear mixed model (GLMM) with binomial error distribution. The response variable was the binary measure of whether an utterance was normative or not (normative vs. nonnormative). The full model included the predictors: age group (3-year-olds vs. 5-year-olds), condition (baseline vs. enforcement vs. teaching), genericness of the utterance (generic vs. nongeneric), their three-way interaction, and the random factor of dyad. The full model improved the fit as compared with the null model ($\chi^2 = 43.49$, $df = 11$, $p < .001$). When compared with a reduced model without the three-way interaction, the full model still improved the fit, suggesting a significant three-way interaction ($\chi^2 = 15.37$, $df = 2$, $p < .001$). To understand the three-way interaction better, we ran the same model (with age and genericness as the predictors) for each condition.

In the baseline condition, there was no systematic pattern of the utterances in terms of genericness or normativity, and there was no age difference. The model did not improve the fit as compared with the null model ($\chi^2 = 4.88$, $df = 3$, $p = .181$), suggesting that this condition did not substantially contribute to the three-way interaction.

In the enforcement condition, the model improved the fit as compared with the null model ($\chi^2 = 14.46$, $df = 3$, $p = .002$). The interaction between age group and genericness was significant; the full model improved the fit as compared with a reduced model without the interaction term ($\chi^2 = 12.98$, $df = 1$, $p < .001$). For 5-year-olds, if an utterance was generic, then it was more likely to be normative than nonnormative ($\chi^2 = 11.36$, $df = 1$, $p < .001$)[2] Fig. 1). The 3-year-olds showed the reverse pattern; if an utterance was nongeneric, then it was more likely to be normative than nonnormative, although this was only marginally significant ($z = -1.76$, $p = .079$).[3]

In the teaching condition, the model improved the fit as compared with the null model ($\chi^2 = 22.83$, $df = 3$, $p < .001$). The interaction between age group and genericness was not significant; the full model did not improve the fit as compared with a reduced model without the interaction term ($\chi^2 = 0.87$, $df = 1$, $p = .351$). In the reduced model, there was no age difference ($z = -0.64$, $p = .519$). If an utterance was generic, then it was more likely to be normative than nonnormative for both age groups ($z = 4.61$, $p < .001$) (Fig. 1).

Discussion

Our results suggest that by 3 years of age, children have a relatively flexible and sophisticated understanding of normative language and its appropriate uses. As compared with a baseline condition, both age groups used normative language in systematic ways in the two other conditions. In the

[2] Because all generic utterances produced by 5-year-olds were normative, the z and the p values were not interpretable and the statistics we report here is the comparison of the model with the null model, which had only the random factor of dyad.

[3] Note that we did not distinguish between speakers within a dyad. One potential problem is that one child did most of the talking in the teaching condition, whereas both children could potentially contribute to the conversation in the enforcement and baseline conditions. This issue is addressed in the post hoc analyses in which we compared age groups in each condition separately.

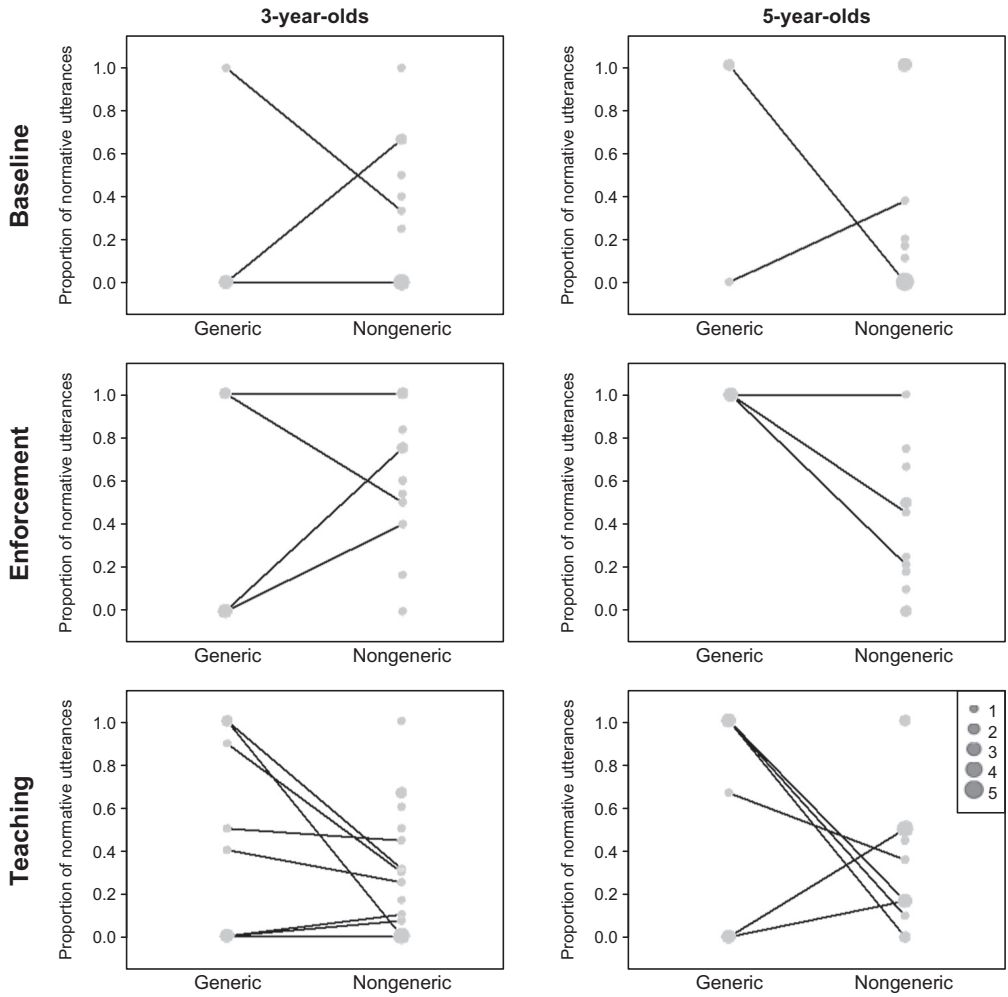

Fig. 1. This bubble plot shows the proportion of normative utterances within generic and nongeneric utterances across the conditions and age groups. The sizes of the bubbles indicate the number of dyads that show the same pattern (the legend). The lines connect the bubbles, which are the observations from the same dyad. The single (unconnected) bubbles indicate the dyads that produced entirely generic or entirely nongeneric utterances.

teaching condition, both 3- and 5-year-olds used normative utterances that were also generic (e.g., *Zu der Blume muss man die Blume legen* 'One must put the flower with the flower,' *Da kommen die Sterne hin* 'The stars come here'). This suggests that both age groups appreciated the generality and agent neutrality of the rules governing their games. Children showed an understanding that the rules were not just about individual cards (this flower card should go to the flower row) but rather there was a rule applicable to all similar cards (all flower cards should go to the flower row). Similar to the findings of Göckeritz and colleagues (2014), which showed that 5-year-olds used generic normative language when teaching game rules to novice peers, our findings show that even 3-year-olds understand the agent neutrality of game rules and make use of generic normative utterances appropriately when teaching them to others.

Although there was no age difference in the way children communicated the rules in the teaching condition, 3- and 5-year-olds differed in the way they protested against their peers' rule violations in

the enforcement condition. The 5-year-olds used generic normative utterances such as *Eigentlich wie im Film, gehoert Stern zu Stern* 'Like in the film, star belongs to star,' whereas the 3-year-olds used non-generic normative utterances such as *Nein, da kommt es nicht hin* 'No it doesn't go there' and *Nein, der muss hier* 'No, it must [go] here.' While intervening in a peer's rule violation, 3-year-olds highlighted the mistake of the peer and corrected this single action through simply reminding him or her where that specific card should go, whereas 5-year-olds appealed to the general rule and corrected the peer's action in a "once and for all" manner just like when they were teaching.

This age difference in the enforcement condition cannot be due to lack of understanding of the agent neutrality of game rules or to differences in linguistic competence given that 3-year-olds were able to produce generic normative utterances in the teaching condition. A likely explanation is that 3-year-olds relied on the common ground more than 5-year-olds. The 3-year-olds rightly assumed that the peer knew the rule, so they did not need to remind the peer of the general rule and perhaps assumed that it was a one-time mistake. The 5-year-olds, on hearing the general rule, were perhaps able to see that the rule the peer expressed was a viable alternative (see also Köymen et al., 2014). In fact, research suggests that during the preschool years children start to appreciate that conventional rules are arbitrary and, therefore, can be changed (Kalish, 2005; Smetana, 2006).

Because ages 3 to 5 years correspond to the developmental period for false belief understanding, 3-year-olds might have had difficulties in appreciating that their peers could have had knowledge different from their own about the game rules. However, the egocentric expectation of the child speaker (expecting the peer to play the game in the way the speaker knows) and the normative expectation (expecting everyone to play the game in the same way) would lead to exactly the same behavior and, therefore, could not be teased apart in our study but should be investigated in future research.

It is also noteworthy that children could successfully infer a rule from a video clip by observing a hand sorting the cards. In these clips, the rules were presented through phrases such as "Star here, flower there." Children later formulated normative statements out of these phrases such as *Zu den Stern muss man Stern* 'One must [put] the star with star' and *Die Blumen kommen immer da hin* 'The flowers always go there' and strategically used these in their peer interactions. This supports prior findings suggesting that young children readily attribute normativity to intentional acts without any need for adult normative language (Schmidt et al., 2011).

To conclude, by 3 years of age, preschoolers communicate game rules effectively and appropriately in their peer interactions depending on the knowledge state of their peers. Their communicative strategies reveal a sophisticated understanding of the generality and agent neutrality of conventional game rules.

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References

Gelman, S. A., Chesnick, R., & Waxman, S. R. (2005). Mother–child conversations about pictures and objects: Referring to categories and individuals. *Child Development, 76*, 1129–1143.

Gelman, S. A., Ware, E. A., Manczak, E. M., & Graham, S. A. (2013). Children's sensitivity to the knowledge expressed in pedagogical and nonpedagogical contexts. *Developmental Psychology, 49*, 491–504.

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

Hollander, M. A., Gelman, S. A., & Star, J. (2002). Children's interpretation of generic noun phrases. *Developmental Psychology, 38*, 883–894.

Kalish, C. (2005). Becoming status conscious: Children's appreciation of social reality. *Philosophical Explorations, 8*, 245–263.

Köymen, B., Lieven, E., Engemann, D. A., Rakoczy, H., Warneken, F., & Tomasello, M. (2014). Children's norm enforcement in their interactions with peers. *Child Development, 85*, 1108–1122.

Nucci, L. P., & Nucci, M. S. (1982). Children's responses to moral and social conventional transgressions in free-play settings. *Child Development, 53*, 1337–1342.

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.
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.
Schmidt, M. F. H., Rakoczy, H., & Tomasello, M. (2012). Young children enforce social norms selectively depending on the violator's group affiliation. *Cognition, 124*, 325–333.
Schmidt, M. F. H., & Tomasello, M. (2012). Young children enforce social norms. *Current Directions in Psychological Science, 21*, 232–236.
Smetana, J. G. (1981). Preschool children's conceptions of moral and social rules. *Child Development, 52*, 1333–1336.
Smetana, J. G. (2006). Social–cognitive domain theory: Consistencies and variations in children's moral and social judgments. In M. Killen & J. Smetana (Eds.), *Handbook of moral development* (pp. 119–153). Mahwah, NJ: Lawrence Erlbaum.
Turiel, E. (1983). *The development of social knowledge: Morality and convention*. Cambridge, UK: Cambridge University Press.