



Done wrong or said wrong? Young children understand the normative directions of fit of different speech acts

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ABSTRACT

Young children use and comprehend different kinds of speech acts from the beginning of their communicative development. But it is not clear how they understand the conventional and normative structure of such speech acts. In particular, imperative speech acts have a world-to-word direction of fit, such that their fulfillment means that the world must change to fit the word. In contrast, assertive speech acts have a word-to-world direction of fit, such that their fulfillment means that the word must fit the world truly. In the current study, 3-year-olds understood this difference explicitly, as they directed their criticisms selectively to actors when they did not follow the imperatives of the speaker, but to speakers when they did not describe an actor's actions correctly. Two-year-olds criticized appropriately in the case of imperatives, but showed a more ambiguous pattern in the case of assertions. These findings identify another domain in which children's normative understanding of human activity emerges around the third year of life.

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1. Introduction

With the beginning of language acquisition in the second year of life, young children learn to engage in an impressive variety of communicative acts in accordance with the conventions and rules of their language: they make statements, issue requests, and ask questions, for example (e.g., Bruner, 1975; Ninio & Snow, 1996; Tomasello, 2003). But beyond *acting in accordance with* the conventions and rules, what do young children *understand about* the conventional and normative structure of their language?

Regarding conventions, recent research suggests that even fairly young speakers have some grasp of the fact that language is a shared conventional system. They understand that in a language community ways of using words

are shared among speakers whereas potentially idiosyncratic affairs such as personal tastes and preferences need not be shared in this same way (e.g., Diesendruck & Markson, 2001; Graham, Stock, & Henderson, 2006; Henderson & Graham, 2005; see also Clark, 1997; Clark, 2007).

But language is not only conventional in the sense of involving socially shared arbitrary sound-meaning assignments; language is a rule-governed, normatively structured practice. Given the conventional rules that constitute a language, there are appropriate and inappropriate, right and wrong uses of the linguistic devices in making speech acts (with assertions, for example, being governed by norms of truth) that apply to all speakers, including the self, in an agent-general manner. Hardly anything is known so far about what, if anything, young speakers understand of this normative nature of language.

Recent research in other (non-linguistic) domains has documented that toddlers from 2 to 3 years begin to get some grasp on the conventional and normative nature of some social practices, above all pretence and other

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rule-governed games. Children from age two have been shown not only learn to play such games in accordance with the rules, but also to understand the normative structure of these games by enforcing the rules towards third parties. When another actor performed acts that violated the rules of the game and thus constituted mistakes, children spontaneously objected, intervened, corrected, or criticized the actor (often saying such things as “No, that’s not how it’s done” or “That’s wrong!”; Rakoczy, 2008; Rakoczy, Warneken, & Tomasello, 2009; Rakoczy, Brosche, Warneken & Tomasello, 2009; Wyman, Rakoczy, & Tomasello, 2009).

In the domain of language, there are two lines of research suggesting that young children might have a rudimentary grasp of some norms involved in making some speech acts. When confronted with an interlocutor labeling objects, children in their second year (at 16 months of age) have been found to look significantly longer to the speaker (and significantly less to the object attended to by the interlocutor) when the label did not match the referent object than when the label did match. In a rather liberal way, this could be interpreted as surprise in response to a violation of a linguistic norm (Koenig & Echols, 2003). In a related vein, slightly older children from their third year, when confronted with an interlocutor making false assertions (e.g., “Peter is eating the cake” when Peter was really eating a carrot), spontaneously rejected (i.e., negated) the assertion (“No! He’s not! He’s eating the carrot”; Pea, 1982).

What these two lines of research show is that young children can interpret the propositional content of an utterance (Peter is eating the cake), assign it a truth value, and reject the utterance in case the truth value is “false” (see also Perner, 1991).

But there are not any simple norms relating the content of speech acts and the world in any all-encompassing ways (such as “always speak such that world and content match”), and correspondingly not one simple category of possible mistakes (of mis-match). Rather, speech acts vary along two dimensions: (i) propositional or semantic content (e.g., that Peter is eating the cake) and (ii) kind/illocutionary force of attitude (assertion, request, question, etc.). One can make the same kind of speech act with the same force but with different contents (e.g., assert that Peter is eating the cake and assert that Peter is drinking milk) as well as different kinds of speech acts with the same content (e.g., assert that Peter is eating the cake, ask whether Peter is eating the cake, request Peter to eat the cake, etc.). Crucially, different kinds of speech act with different illocutionary force differ in “direction of fit” (e.g., Anscombe, 1957; Searle, 1969; Searle, 1983; Smith, 1987). Some speech acts have “word-to-world” direction of fit: they aim at representing the world truly and accurately. Assertions are the paradigmatic case. The assertion “Peter is eating the cake” aims at truth, and if its propositional content is not fulfilled, the mistake is on the part of the speaker. The opposite direction of fit is “world-to-word” and pertains paradigmatically to imperative speech acts (e.g., “Peter, eat the cake!”). If they are not fulfilled – if word and world do not match – the mistake is not on the part of the speaker, but on the part of the addressee.

Assertive and imperative speech acts can thus have the same propositional content (e.g., that Peter is eating the cake), but due to their different directions of fit admit of different kinds of mistakes in the case that the content is not fulfilled (say, Peter is not eating the cake, but the carrot), and consequently invite different forms of justified critique. In the case of an unfulfilled assertion, the speaker is to be criticized for mis-speaking (“No, Peter isn’t eating the cake, he’s eating the carrot”), whereas in the case of an unfulfilled imperative¹ the hearer is to be criticized for acting wrongly (“No, Peter, that’s not the cake you’re eating!”).

So from the work by Koenig and Echols (2003) and Pea (1982) we know that young children can track the fulfillment/non-fulfillment of the propositional content of speech acts: in cases of non-fulfillment they look longer to the speaker or negate the utterance by saying “No”. But what these studies leave open and what we thus currently do not know is whether young children understand the *normative* structure defining different kinds of speech acts, in particular the normative structures deriving from different directions of fit of different kinds of speech acts.

In fact, some theories of children’s developing understanding of representations more generally claim that before classical “theory of mind” age (around age 4), children’s grasp of representations is confined to an understanding of the *content* of representations without any substantial understanding of different *forces* and *directions of fit*. For example, according to one prominent account (Perner, 1991), children from their second year on acquire the ability to reason in multiple mental models: in models about current reality on the one hand, but also in models about fictional scenarios (according to which they act in their pretend play) or in models about potential future states of affairs (towards bringing about of which they act in goal-directed deliberate activity).

Early language use and comprehension, according to this account, are another example of using multiple mental models: in a two-step process (modeled on situation semantics), the child can interpret an utterance’s propositional content by first building up a mental model of the represented state of affairs. In the second step, the truth value of the utterance can then be determined by comparing this model with the model of reality. This allows for a simple heuristic in dealing with utterances: compare the two models, if they match, the utterance is fine, and if they do not match, the utterance is to be rejected.

What children in this phase (before “theory of mind” age around 4 years) cannot yet do according to this account, however, is reason not only in multiple parallel models, but reason meta-representationally in models such that one bears a representational relation to the other. Such meta-representational abilities emerge around 4 years of age and reveal themselves in children’s ability to understand the representational nature of mental states such as beliefs (classically measured in the false belief task; Wimmer & Perner, 1983), and of non-mental representa-

¹ Given that the imperative is a justified one whose force the recipient has in some sense accepted.

tions such as signs (e.g., Leekam, Perner, Healey, & Sewell, 2008). In particular, only at this age do children begin to understand that some representations (e.g., beliefs, assertions, sign-posts, etc.) aim at truth and are false if their content fails to match the world. In the linguistic domain, this limitation is easily obscured by the fact that the younger child operates with the above mentioned matching heuristic: utterances where propositional content and world fit are okay, utterance where they do not fit are rejected.

Empirical evidence for this account comes from a series of studies that investigated young children's understanding of different kinds of communication failure (Robinson & Robinson, 1976, 1977a, 1997b, for an overview see: Robinson, 1986). In these studies children were involved in situations in which a speaker gave a listener instructions (e.g., which of several objects to pick), and in which there were communication failures either due to the listener's fault (e.g., by disregarding the instruction) or due to the speaker's fault (e.g., by giving a non-informative description of the target object). When asked whose fault the communication failure was, younger children (up to the age 5–6 years) invariably blamed the listener. According to one interpretation (e.g., Robinson, 1986), what children operated on was a simple heuristic that just tests whether the speaker's utterance and the listener's act match, and criticize the listener in cases of mis-match – a heuristic quite like the one mentioned above that allows for the rejection of false assertions. This heuristic, however, again does not allow a differentiation of different mistakes based on different directions of fit and thus differential and appropriate critique of the different actors.

In the present study, therefore, we aimed to test whether young children not only track the propositional content of speech acts, but also track speech acts according to propositional content and illocutionary force of the act, as well as differentially track different kinds of mistakes based on different forces. The present study thus goes beyond measuring children's tracking of propositional content only (as in Pea, 1982) by introducing variation in direction of fit and looking at children's differential normative interventions towards different actors in cases of non-fulfillment. In contrast to other previous work (in particular by Robinson and Robinson (1976), Robinson and Robinson (1977a, Robinson and Robinson (1977b), which used quite complex discourse situations), however, simpler kinds of communication failure were used to tap early competence. Children were presented with two puppets, one of whom (the actor) performed some actions about which the other puppet (the speaker) made speech acts such that their content did not match the act of the actor. In the *assertion* case, the speaker mis-described the actor's action, whereas in the *imperative* case the speaker requested the actor to perform an action (which he assented to) but he then performed some other action. Following previous research that investigated children's spontaneous rejection of false statements and their spontaneous intervention in response to action mistakes, we measured spontaneous normative responses (critique, rejection, teaching, etc.) to the different kinds of mistakes. If children have a grasp of directions of fit and different mistakes based upon

them, they should differentially criticize the speaker in the assertion case and the actor in the imperative case.

2. Method

2.1. Participants

Twenty-four 2-year olds (24–28 months, mean = 26 months; 12 boys) and 24 3-year olds (35–38 months, mean = 37 months; 13 boys) were included in the final sample. Three additional children were tested but had to be excluded because they were uncooperative. The children were recruited in urban daycare centres, came from mixed socio-economic backgrounds, and were native German speakers.

2.2. Design and procedure

All testing was done by two experimenters in a quiet separate room of children's daycare centres. At the beginning of each session, the first experimenter (E1) introduced the child to two hand puppets (a cow and an elephant). The puppets were located in a cardboard toy house, each in a separate room, facing the child and separated from each other by a wall. The house was built on stilts so that there was a space below the rooms of the puppets which the child – but not the puppets – could see and reach. There were different objects located in both rooms and below the stilts (see below). The puppets were operated by a second experimenter (E2) sitting behind the toy house. E1 then played with the child and the two puppets until the child felt comfortable (e.g., by rolling balls back and forth between them, stacking discs and looking at a picture book together). In the course of these warm-up games, both animals occasionally made mistakes by mis-labeling objects or by operating a toy in a wrong way, and children were given a chance to spontaneously correct the puppets. The rationale for this was to give children, particularly shy ones, time to familiarize themselves with situations where mistakes happen and they can intervene.

Each child, in a within-subjects design, then participated in two kinds of test trials administered in blocks of three trials of each kind. Both kinds of trials were structurally analogous in that one puppet (the *actor*) performed an action, and the other puppet (the *speaker*) made a speech act about that action whose propositional content was not fulfilled. The only difference was in the kind of speech act: while in the *assertion* condition, the speaker mis-described the act, in the *imperative* condition the speaker gave a directive which the actor failed to fulfill. The concrete procedure was as follows: in the *assertion trials*, E1 first explained to the child that one puppet (the *actor puppet*, e.g., the cow) would now do something and that the other puppet (the *speaker puppet*, e.g., the elephant) would say what the acting animal was doing. The *actor* puppet then started to perform an action with an object in her room, e.g., cook an egg in a saucepan. The *speaker* puppet then mis-described this act: "The cow is cooking the carrot". Importantly, the object referred to by the speaker (the carrot) was in fact located in the space under the stilts.

The actor performed her act for about 20 s. After the act, the speaker made the same false assertion once more in the present perfect (“The cow has cooked the egg”).

In the *imperative trials*, E1 first explained to the child that one puppet (the *speaker puppet*, e.g., the elephant) would now tell the other puppet (the *actor puppet*, e.g., the cow) what to do and then the latter animal would do so. The *speaker puppet* then uttered an imperative: “Cow, feed the pig!”, whereupon the *actor puppet* started to perform an action (for about 20 s) with an object in her room, e.g., feed a toy monkey. Importantly, the object referred to by the speaker (the toy pig) was in fact located in the space under the stilts. During the act, the speaker repeated her imperative once.

There were six possible scenarios (see [Appendix 1](#)) that could be administered both in an *assertion* and an *imperative* version. Across children it was counterbalanced which scenarios were given in which condition. Furthermore, across children it was counterbalanced in which order the blocks were administered, as well as the within-block order, which animal played which role, and which object was acted by the actor (and which was mentioned by the speaker and located under the stilts).

2.3. Observational and coding procedure

All sessions were videotaped and coded from tape by a single observer (O). Children’s relevant spontaneous responses to the puppet’s utterances and actions in the six test trials were first carefully described and children’s utterances were transcribed verbatim. Of particular interest were spontaneous forms of intervention, protest, critique or rejection in response to one of the puppet’s acts or utterances. For each relevant act, it was first determined against which puppet it was directed, and then for both responses to the speaker and responses to the actor one of the following hierarchically ordered codes was given: (1) *Normative protest*: the child criticizes a puppet with explicit normative vocabulary (e.g., “No, you said that wrong!” in response to the speaker or “You did that wrong!” in response to the actor). (2) *Directive protest*: the child criticizes a puppet in direct response to the puppet’s act or speech act with an utterance that formally makes it clear that it is directed against this animal (an utterance that would not make sense to criticize the other puppet). For example, in response to the elephant’s assertive speech act “The cow is cooking the carrot”, the child says “No, it is not! It is cooking the egg”. Or in response to an action mistake by the cow (feeding the monkey instead of the pig after the imperative “feed the pig!”), the child says “No, this is not the pig you’re feeding, that down here is the pig!”). (3) *Implicit protest*: like in (2), the child clearly criticizes a puppet in direct response to the puppet’s act or speech act. The difference to (2) is that, while it is clear from the context and the child’s behaviour (direction toward one animal, tone of voice, etc.) which animal is being criticized, the form of words of the child’s utterance could have been used to criticize the other puppet as well. For example, in response to the elephant’s assertive speech act “The cow is cooking the carrot”, the child says to the elephant forcefully “The carrot is down there!”. Or in

response to an action mistake by the cow (feeding the monkey instead of the pig after the imperative “feed the pig!”), the child says “But the pig is down there!”. (4) *Show/give*: the child shows or gives the target object (the one referred to in the speech act; the carrot in the first example, the pig in the second) to one of the animals.

In total there were thus eight protest categories (2 (against which puppet) \times 4 (level of protest: normative–directive–implicit–show/give) = 8). As the focus was on the most sophisticated forms of protest children produced, for each task a given child got as score the highest score that appeared in this task (e.g., if the child produced an action qualifying as protest against the speaker on level (1) (normative) and an action qualifying for critique of the speaker on level (3) (implicit) on one and the same trial, this trial got the score *normative protest against speaker*²).

A second independent observer blind to the hypotheses of the study coded a random sample of 20% of all the sessions for reliability. Reliability was good (ordered $\kappa = .81$).

3. Results

For purposes of analysis, for each of the eight protest categories, separate sum scores over the three trials per condition were computed which are shown in [Fig. 1](#).

In the assertion condition, 3-year-olds showed (any of the four) forms of protest against the speaker in 47% of the trials (with 16 of 24 children showing such protest in at least one trial) and against the actor in only 15% of the trials (with 7 of 24 children showing such protest in at least one trial). The 2-year-olds in this condition showed forms of protest against the speaker in 13% of the trials (with 7 of 24 children showing such protest in at least one trial) and against the actor in 10% of the trials (with 6 of 24 children showing such protest in at least one trial).

In the imperative condition, 3-year-olds showed forms of protest against the actor in 60% of the trials (with 21 of 24 children showing such protest in at least one trial) and against the speaker in only 3% of the trials (with 2 of 24 children showing such protest in at least one trial). The 2-year-olds in this condition showed forms of protest against the actor in 25% of the trials (with 11 of 24 children showing such protest in at least one trial) and against the speaker in 0% of the trials (no child ever showing such protest).

For the purposes of statistical analysis, the data were further condensed by building sum scores (one for protest against the actor, the other for protest against the speaker) in each condition of tasks (0–3) with any of the three convincing forms of protest (normative, directive, or implicit protest – “show/give” was dis-regarded in the analysis because it was too ambiguous as a measure of normative awareness).

In a first and most stringent way of analyzing the data, in each condition children’s appropriate protest towards one puppet was compared to their inappropriate protest towards the other puppet. As the data failed to fulfill some

² If children criticized first one puppet and then the other, the first kind of critique was counted.

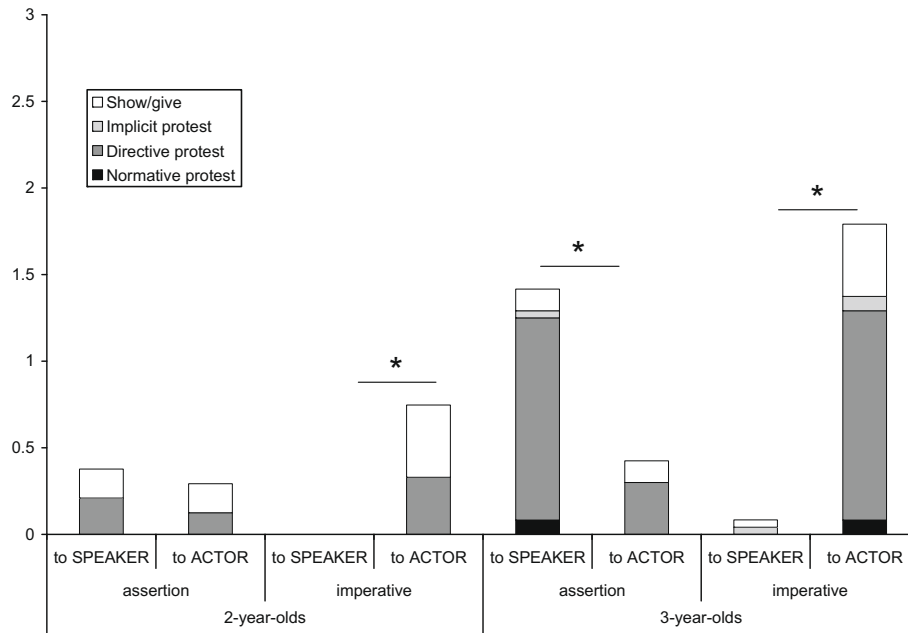


Fig. 1. Mean sum scores (over the three trials per condition) of the four forms of protest in response to each puppet for both age groups.

requirements for parametric statistics, all analyses were conducted with non-parametric tests.³ Wilcoxon tests revealed that the 3-year-olds protested more often against the speaker than against the actor in the assertion condition ($z = 2.67, p < .01$, effect size: $r = .39^4$), and more often against the actor than against the speaker in the imperative condition ($z = 3.69, p < .01$; effect size: $r = .53$). The 2-year-olds did not show such a significant differential pattern in the assertion condition ($z = 1.00, p < .16$; effect size: $r = .15$), but protested more often against the actor than against the speaker in the imperative condition ($z = 2.33, p < .01$; effect size: $r = .34$).

Arguably, however, this first way of analyzing the data poses a very strict criterion for successful performance in that it requires children in each condition to respond significantly more often with the correct than with the incorrect response. Against this it can be argued that such an analysis neglects performance factors, such as prepotency of one reaction type. In this case the pre-potent response could be protesting in the more salient direction, in the direction where the action is, that is, with the actor rather than with the speaker. In an alternative approach, there-

fore, we analyzed protest towards each puppet as a function of condition. That is, protest against the speaker in the assertion condition (where it was appropriate) was compared to protest against the speaker in the imperative condition (where it was inappropriate). Analogously, the same kind of analysis was run for protest against the actor.

For both age groups these comparisons were significant (3-year-olds: protest against speaker, $z = 3.56, p < .01$; effect size: $r = .51$; protest against actor: $z = 3.12, p < .01$; effect size: $r = .45$; 2-year-olds: protest against speaker, $z = 1.90, p < .05$; effect size: $r = .28$; protest against actor: $z = 1.67, p < .01$; effect size: $r = .24$).

4. Discussion

The present findings show that by 3 years of age young children understand the basic normative structure of word-to-world and world-to-word direction of fit. They differentially track mis-matches between the contents of speech acts and the world relative to speaker and recipient and intervene on the appropriate side: against the speaker in the case of false assertions, against the recipient actor in the case of unfulfilled imperatives. This goes beyond previous findings that children detect mis-matches between assertive speech acts and the world as indicated in their looking longer to the speaker after such mis-matches (Koenig & Echols, 2003). While mere looking patterns are difficult to interpret conclusively, the present measures – children's spontaneous normative interventions such as protest, critique, etc. – themselves indicate more clearly a kind of normative awareness: children not only detected mis-matches, but differentially and appropriately leveled critique as a function of different kinds of mis-matches based on different directions of fit. It might be objected

³ Unless stated otherwise, all significance levels reported are one-tailed because the tests were based on directed hypotheses (such that children protest more appropriately against the puppet who actually committed a mistake than inappropriately against the other puppet). To account for multiple testing, we used Fishers omnibus test. This method combines a number of p -values into a single chi-square-distributed variable with degrees of freedom equaling twice the number of p -values (Haccou & Meelis, 1994; Quinn & Keough, 2002). When this reveals significance it indicates that the group of tests is significant as a collective. In the present case this test was highly significant: $\chi^2 = 75.32, p < .01$.

⁴ This is a measure of effect size used for Wilcoxon test, defined as z divided by the square root of the number of observations (in the present case 48; see, e.g., Field, 2005).

that a simple associative explanation (one without reference to children's understanding of the normative directions of fit) is possible such that children simply associate assertions with speakers and imperatives with actors. But while such an explanation could account for mere differential orientation (looking to the actor/speaker; and perhaps for the ambiguous category "show/give in the present study), it seems unable to account for the cognitively more sophisticated behaviour found, namely differential *normative intervention*.

The present results regarding the 3-year-olds also fit with other recent findings in suggesting that by 3 years of age children have acquired a solid grasp of the basic structure of rule-governed activities: their normativity (there are dimension of appropriate/inappropriate moves in the context of the practice; Rakoczy, 2008; Rakoczy et al., 2008) and context-relativity (what counts as a mistake in one context can be perfectly appropriate in another; Rakoczy, Brosche, et al., 2009; Wyman et al., 2009). The present study adds to these findings in showing that young children by 3 years systematically differentiate within the normative space between different directions of fit and the different kinds of mistakes based upon them: not only do they know *when* some act is a mistake and when not (context-relativity); they appreciate *whose* mistake a given act is as a function of direction of fit.

The 2-year-olds in the present study showed a more ambiguous pattern of responses: while on a more liberal analysis (looking at protest against a given puppet as a function of condition), these children performed competently, the more stringent analysis (for a given condition, compare protest against the speaker and against the actor) revealed competence only in the *imperative* condition. This might reflect some genuine pragmatic limitation such that children this age still need to come to acquire a solid differentiation between different kinds of speech acts with different illocutionary forces – a possibility that is compatible with some previous work on children's developing grasp of different illocutionary forces around 2–3 years of age (e.g., Reeder, 1980). Relatedly, the 2-year-olds' response pattern might be indicative of an underlying cognitive shortcoming such that children lack insight into the normative structure of the word-to-world direction of fit in particular. In fact, such a possibility would be compatible with some theory of mind research suggesting that children's understanding of desires (with world-to-mind direction of fit) develops before their corresponding understanding of beliefs (with mind-to-world direction of fit) (e.g., Hadwin & Perner, 1991; Rakoczy, in press; Rakoczy, Warneken, & Tomasello, 2007; Wellman & Woolley, 1990).

Alternatively, however, it might also be that the present methodology failed to unmask existing competence in the 2-year-olds. Several considerations could be taken as suggestive of this possibility. First of all, the 2-year-olds showed little protest generally, and this might be because such spontaneous intervention behaviour is a very demanding measure, requiring social assertiveness. Second, the matching parallel structure in the assertion and imperative cases might have made the statements slightly artificial and thus harder to parse. Thirdly, in the present design, there might be an asymmetry such that one pup-

pet's behaviour – the actor's – is always more salient (because there is concrete physical happenings going on) and thus lends itself as a default point for intervention. If this were the case, the higher baseline for protest against the actor over the speaker should be taken into account. In fact, the more liberal analysis (looking at protest against the actor puppet as a function of condition, and analogously for protest against the speaker puppet) can be seen as doing exactly this – and this analysis yields positive results even for the 2-year-olds. Relatedly and finally, it might be that children simply are more skilled in dealing with imperatives, just because they have more experience with their conditions of satisfaction in everyday life (when authors of non-fulfilled imperatives draw perceivable consequences towards the child recipient).

Future research will have to test for such possibilities and to further investigate the nature of young children's grasp of the normativity of direction of fit before age 3 more generally.

Another question for future research concerns subsequent developments after age 3 in grasping more complex aspects of illocutionary force and normative directions of fit. Different kinds of speech acts and intentional attitudes are partly distinguished by different combinations of directions of fit (Searle, 1975). Furthermore, some kinds of speech acts (and corresponding intentional attitudes) are not only defined by a direction of fit, but more specifically by ways the fit has to be established. In particular, some speech acts are set apart by involving elements of so-called "causal self-referentiality" (e.g., Harman, 1976; Searle, 1983). Imperative speech acts, for example, require for their fulfillment not only that the propositional content be fulfilled, but that it be fulfilled by the recipient *because of* her understanding of the very imperative. Similarly, intentions, in contrast to desires, require that the intention itself be involved in bringing about the intended state of affairs in the right kind of way. It is an important question for future research how children's grasp of this self-referentiality defining a sub-class of speech acts and intentional attitudes develops. On the one hand, some previous work on young children's responses to communication failure suggest that even 2–3-year-olds might have some awareness of the self-referentiality of imperative speech acts. In one study, when children's imperative ("give me the A!") was misunderstood by a recipient ("I see, you want the B"), but then the content of the imperative was fulfilled nevertheless (the interlocutor gave the child the A by accident), children seemed unsatisfied although they got what they wanted, engaging in attempts at communicative repairs and clarification (Shwe & Markman, 1997). On the other hand, however, a different line of research in the domain of understanding intentional attitudes suggests that young children before age 4–5 have difficulty distinguishing intentions from desires along the dimension of self-referentiality (Astington, 2001; Feinfield, Lee, Flavell, Green, & Flavell, 1999). More research is thus needed to address the question how these findings relate to each other and what they show about the children's understanding of self-referentiality.

Similarly, commissive speech acts such as promising involve causal self-referentiality: a promise of mine counts as properly fulfilled only if I performed the relevant action

at least partly because I promised to do so. Existing research on children's understanding of commissive speech acts suggests that children acquire a grasp of the logical structure of such acts rather late in the primary school years up to age 9 (e.g., Astington, 1988; Mant & Perner, 1988). What we do not yet know, however, is which role in that protracted development is played by the logical challenge of understanding self-referentiality.

A final question regarding subsequent development concerns children's emerging understanding of more complex mixed forms of direction of fit. Performative speech acts (e.g., "I hereby declare you married" or "From now on this ship is called 'MS. Titanic'" uttered in the right context) can be seen as having both directions of fit (Searle, 1969; Searle, 1975): making the utterance both brings about the corresponding state of affairs (the couple is married, the ship called 'Titanic') and describes it. Appreciating this double direction of fit is particularly important for understanding institutional reality that is both objectively real and at the same time constructed by us (Searle, 1995). So far we do not know much about children's developing grasp of the logical structure of such performative speech acts in serious institutional contexts. But plausibly an early form of such speech acts can be seen in children's fictional declaration in their pretence games. "You are now the king, and I'm the queen, and this room is our country" seems to share the logical deep structure of performatives: it both brings about a fictional state of affairs and describes it (e.g., Rakoczy, 2008; Walton, 1990). Future research will need to tell us more about how young children's understanding of these logical structures develops.

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Appendix 1.

Scenarios used in the study (counterbalanced which scenario in which condition).

- | | |
|---|--|
| 1 | Put a puppet on the chair /in the bed |
| 2 | Put the little block /the toy table into a box that makes sounds |
| 3 | Give a drink to the frog /the lion |
| 4 | Cook the egg /the carrot |
| 5 | Put the car /the train into a garage |
| 6 | Feed the monkey /the pig |

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