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# Parents Produce Explicit Cues which Help Toddlers Distinguish Joking and Pretending

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Abstract

While separate pieces of research found parents offer toddlers cues to express that they are (1) joking and (2) pretending, and that toddlers and preschoolers understand intentions to (1) joke and (2) pretend, it is not yet clear whether parents and toddlers consider joking and pretending to be distinct concepts. This is important as distinguishing these two forms of non-literal acts could open a gateway to understanding the complexities of the non-literal world, as well as the complexities of intentions in general. Two studies found parents offer explicit cues to help 16- to 24-month-olds distinguish pretending and joking. Across an action play study (N=25) and a verbal play study (N=40) parents showed more disbelief and less belief through their actions and language when joking versus pretending. Similarly, toddlers showed less belief through their actions, and older toddlers showed less belief through their language. Toddlers' disbelief could be accounted for by their response to parents' language and actions. Thus these studies reveal a mechanism by which toddlers learn to distinguish joking and pretending. Parents offer explicit cues to distinguish these intentions, and toddlers use these cues to guide their own behaviors, which in turn allows toddlers to distinguish these intentional contexts.

Keywords: Non-literal; Pretend; Humor; Parent-child interaction; Cues

# Parents Produce Explicit Cues which Help Toddlers Distinguish Joking and Pretending

Human life is permeated with social institutions with conventional and normative structures. In order to participate in collective activities, children must learn how to act within these settings. One interesting question is how children differentiate violations of normative rules. This is an important, yet difficult concept required to both understand and distinguish humor, pretense, lying, false belief, and metaphor (Hoicka & Gattis, 2008; Hoicka, Jutsum, & Gattis, 2008; Leekam, 1991).

While some accounts suggest children possess an innate capacity to understand others' pretense and false beliefs (e.g., Leslie, 1987), such accounts do not explain how children distinguish when someone is pretending versus joking, or even following convention. For example, how do we use telephones? We could speak into it when someone is on the other end (literal). We could speak into it when no one is listening (pretending). We could put the receiver on our foot and speak (joking). To an adult, the act in and of itself may distinguish whether someone intends to joke, pretend, or be literal. However, for toddlers still learning about objects, it may not be clear which act follows which intention. If they have little experience with telephones, any act could be considered literal. Even with experience, the pretend act could be seen as joking (it's silly to talk to no one) and the humorous act could be seen as pretending (she's pretending her foot is her ear). It is thus plausible that parents give additional cues to help toddlers distinguish amongst various types of communicative intentions.

We have many conventions across languages and cultures, including uses of words and objects Searle (1969, 2005). For instance, in English the class of animal that has wings, a beak, lays eggs, and (usually) flies, is conventionally referred to as "bird." However in French, the convention is to call it "oiseau." In terms of objects, we conventionally use knives to cut things, and we conventionally use paper and metal (money) in exchange for goods and

services. One way in which parents might distinguish intentions to joke and pretend is to highlight that joking should be viewed as breaking convention to a greater extent than pretending. Thus parents might show more disbelief and less belief when joking versus pretending. We propose this because, first, theoretically, joking, at its most basic in early development, is intended to break convention (e.g., Hoicka & Gattis, 2008; Hoicka, et al., 2008). For instance, if putting a boot on one's hand to joke, all that is necessary to appreciate the joke is to understand that that is not where the boot conventionally goes. It is not necessary to imagine the boot is a glove, and to do so may take away from the humor. In contrast, while pretending technically breaks conventions, in the landscape of another possible world, or one's imagination, no conventions have been broken (e.g., Nichols & Stich, 2003). Thus if pretending that a block is a sandwich, it would be necessary to allow logical conventional consequences of this hypothetical situation, such as "eating" the block. Thus putting a block to one's mouth would be conventional given the assumption that it is a sandwich. Therefore pretending must be conventional given some assumptions. Joking does not have this requirement.

Additionally, past research suggests parents give toddlers different input when joking versus pretending. When parents read a humorous versus literal book to their toddlers, they produced more disbelief language (Hoicka, et al., 2008). For example, if parents read funny book pages such as, "The ducks say moo." they would then produce disbelief language such as, "Ducks are supposed to say quack." suggesting toddlers should reject the prior sentence. This is further supported by parents' production of rising intonation contours when joking, expressing questioning or contradiction (Hoicka & Gattis, 2012). Thus when joking, parents offer cues to suggest toddlers should disbelieve the information, which could help toddlers reject the information contained in the joke. However, the above studies have not considered whether parents also offer cues expressing belief when joking.

In contrast, parents may encourage belief in pretend acts. When parents pretended versus acted literally (e.g., pretend to eat and drink versus really eat and drink), parents produced more words of the absent object in the pretend scenario (i.e., cheerios, juice; Lillard, et al., 2007; Lillard & Witherington, 2004). Parents also produced more movements related to eating and drinking when pretending, such as eating, drinking, pouring, and serving (Lillard, et al., 2007; Lillard & Witherington, 2004). Thus parents may encourage children to believe their pretend act does follow convention, at least in an imaginary space. Additionally, experimental evidence shows that rather than reject information learnt in a pretend context, 3- and 4-year-olds generalize that information to the real world (Sutherland & Friedman, 2012). However, the goal of this body of research was not to determine whether parents expressed belief to cue pretending. Furthermore, disbelief has not been analyzed in the context of pretending. Finally, parents' cues to joking and pretending have not been directly compared, leaving the possibility open that parents do not mark these behaviors distinctively.

In the following studies, parents acted out scripted jokes, pretending, and literal play for their toddlers. It is possible for joking and pretending to overlap. For instance, one could pretend that a bucket is a hat, and also find it funny. However, as the above research shows, joking and pretending often do not overlap, and have different underlying definitions. It is the difference that this study aims to focus on. Therefore, jokes were designed to resemble prototypical jokes in early development, and, importantly, not to look like pretense. Similarly, pretending was designed to resemble prototypical pretense in early development, and, importantly, not to look like jokes. This was to ensure the studies captured the essence of joking and pretending without confounding the two. We examined parents' production of belief and disbelief language and actions during joking, pretending and literal play, based on previously-researched parental cues (e.g., Hoicka et al., 2008; Lillard, et al., 2007; Lillard & Witherington, 2004). For instance, if saying an object is a shoe, one could show belief by

saying, “It goes on your foot.” or putting the object on one’s foot. In contrast, one could show disbelief by saying, “That’s not a shoe.” or performing an action that does not go with shoes, e.g., putting the object on one’s head.

When joking versus pretending, we expected parents to show more disbelief, and less belief belief, through language and actions, reflecting the above definitions of joking and pretending (e.g., Hoicka, et al., 2008; Nichols & Stich, 2003). Because less is known about pretending in relation to belief, there are several possible predictions regarding how parents might express pretending versus literal play. When pretending versus playing literally, we predict parents would either: show more disbelief as the acts technically break convention (e.g., Hoicka, et al., 2008); show less belief as previous research suggests (e.g., Lillard, et al., 2007; Lillard & Witherington, 2004); show no difference as pretending might be thought of as literal once the pretend context is established (Nichols & Stich, 2003; Sutherland & Friedman, 2012); or a combination of differences in both directions as pretense both breaks conventions (technically) and follows convention (in one’s imagination) at the same time (e.g., Hoicka, et al., 2008; Nichols & Stich, 2003).

We examined toddlers’ actions, as 1-year-olds have a good grasp of actions (e.g., Hunnius & Bekkering, 2010). Since 1-year-olds are still developing their vocabularies (e.g., Hamilton, Plunkett, & Schafer, 2000), and as toddlers begin to master the production of negation towards their second birthday (Choi, 1988; Hummer, Wimmer, & Antes, 1993), we examined a simplified version of their verbal responses, focusing on their production of negation (e.g., “No!”) We expected toddlers to distinguish joke, pretend, and literal contexts as parents did, and to show markers of belief (i.e., actions showing belief) shortly after parents expressed belief, and markers of disbelief (i.e., negation, actions showing disbelief) shortly after parents expressed disbelief. This would reveal a mechanism through which toddlers learn to distinguish joke, pretend, and literal contexts.

## Study 1

Parents were instructed to produce specific, scripted, action-based joking, pretending, and literal play with their 16- to 20-month-olds, which were all tied to the same target sentences. This was to ensure that actions and utterances relating to the target sentences could be directly compared, allowing experimental control. Jokes involved misusing objects (e.g., food on head) corresponding with the first stage of humor development (McGhee, 1979), which is understood from 15 months (Hoicka & Wang, 2011), and produced from 15 months (Loizou, 2005). Pretending included symbolic pretense (e.g., "washing hands" without soap or water), which is understood from 15 months (e.g., Bosco, Friedman, & Leslie, 2006), and produced from 15-18 months (e.g., McCune-Nicholich, 1981); and object substitution (e.g., pretending a round sponge is a hat), which is understood from 15 months when the substitute has a similar look or form to the original (e.g., Onishi, Baillargeon, & Leslie, 2007). Therefore these types of joking and pretending were chosen to match toddlers' stage of development, making the study as naturalistic as possible.

### Method

**Participants.** Twenty-five parents (1 father) and their toddlers (M = 17 months, 12 days, range = 16 months, 0 days to 20 months 1 day; 13 boys) participated. Another 5 participants were excluded because children refused to participate. All children were Caucasian. Most parents had a university degree. Participants were recruited through parent and toddler activities, and advertising through posters, facebook, and parenting websites.

**Materials.** Objects for the washing scenarios included a washing-up bin, water, liquid soap bottles, liquid soap, sponges, and cloths. Objects for the dressing scenarios included hats, scarves, gloves, plastic envelopes, a round sponge, and a long plastic tube. Objects for the eating scenarios included small cookies, pieces of rice cakes, water, orange drink, a clear plastic bottle, a clear plastic cup, and a plate. Objects for the coloring scenarios included

papers with shape outlines, crayons, and sticks. Two Sony digital camcorders recorded the sessions.

**Design.** This was a within subjects. For the main analysese, the independent variable was the Action Type for each trial: Joke, Pretend, or Literal. The dependent variables included parents' Belief and Disbelief Language; children's Negation; and parents' and children's Target Actions. Two other independent variables were examined for whether they interacted with the main independent variable: children's age, and type of pretending (symbolic, object substitution). For the lag sequential analyses (LSA) examining the effects of parent cues on children's behaviors, the independent variables were the parent dependent variables listed above, as well as Other Actions as a control for Target Actions. The dependent variables were the child dependent variables listed above, as well as Other Actions as a Control for Target Actions, and Other Language as a control for Negation. For the LSA examining the effects of children's cues on parents' behaviors, the independent and dependent variables were reversed. See next section for counter-balancing.

**Procedure and Counter-Balancing.** Before the study, parents were only told that we were interested in discovering how parents and toddlers interact when playing, including when they joke and pretend. Therefore the hypotheses were not disclosed. Each parent and toddler sat at a table, with the parent in a chair, and the toddler in a high chair. Parents acted out four trials for two minutes each: Joke, Pretend, Literal, and a fourth literal trial run for another study (a neutral control for a study examining smiling and acoustics). At the beginning of Literal trials, parents were told, "Show your excitement and happiness…" (e.g., "about having a special treat.") At the beginning of Pretend trials, parents were told, "You are going to pretend that…" (e.g., "you're eating and drinking with your child.") At the beginning of Joke trials, parents were told, "Use the objects the wrong way to make jokes with your child." Children could have heard these general instructions, however it seems

unlikely that they would show a greater effect than parents' interactions themselves. We chose to instruct parents to show their excitement and happiness in the Literal condition to control for positive emotion across conditions. If parents took the literal task seriously, then differences between the Literal and Pretend conditions may be due to the fact that parents and children were playing, and therefore more positive, in the pretend condition, rather than due to the fact that the pretend context was non-literal (see Hoicka & Akhtar, 2011).

Each trial had three Target Sentences paired with Target Actions that parents could say and act out at any point during the trials. The Target Sentences were the same across Action Type (Joke, Pretend, Literal), but Target Actions varied across Action Types (see Appendix A for all pairings). Parents said each of three Target Sentences (e.g., in the Eating trial: "I'm going to have a drink.") and acted out one of the corresponding actions (e.g., Literal: drink from cup; Pretend: put empty cup to mouth; Joke: put cup of water to elbow).

The actions were described on paper, with an accompanying photo in the Joke trials. We chose not to include an accompanying photo for the Literal and Pretend trials because the actions chosen were conventional and well-known, even if the objects differed. For example, if a parent was asked to pretend to drink from an empty cup, the action itself is easy to identify. However, the joke actions did not necessarily correspond to conventional actions, e.g., we do not typically put anything to our elbow, including a cup of water. Therefore we used a photo to ensure parents understood the task, and to make performance as similar as possible across the Joke trials. Additionally, two Pretend trials involved symbolic pretense (Washing, Eating), while two Pretend trials involved object substitution pretense (Dressing, Coloring). In contrast, all the Joke trials involved misusing objects, and all the literal trials were literal.

Target Sentences were the same across trials to allow experimental control – any differences in responses by parents and children would be attributed to how the Target

Actions related to the Target Sentences, and could not be attributed to the Target Sentences alone. While using specific sentences and actions gave better experimental control, it may have made the study less naturalistic. However, this was deemed necessary to avoid confounds, and parents appeared to act naturally throughout the study regardless. Since these instructions were printed on paper kept away from the child, children only learned about this information through their parents. Additionally, it was necessary to use different objects across trials. For instance, if we had used gloves in all three conditions, it would be difficult for a parent to pretend to put on the glove if it really was a glove – this would lead them to literally putting on a glove. Thus we chose, in this instance, plastic envelopes so that parents could actually pretend. Additionally, we made the literal items more exciting in the Literal trials to increase positive affect in the Literal condition so that it would be as emotionally positive and engaging as the other two playful conditions.

Joke, Pretend, Literal, and the other literal trial types were crossed with Washing, Eating, Dressing, and Coloring scenarios (see Appendix A for all scenarios). For example, one parent would act out joke washing (e.g., putting foam on nose instead of hands), then literal (not analyzed) eating (e.g., eating rice cakes), then literal (analyzed) dressing (e.g., putting hat on head), and then pretend coloring (e.g., moving sticks on paper). However another parent would act out pretend eating (e.g., moving fingers from plate to mouth, without food), then literal (analyzed) coloring (e.g., coloring with crayons on paper), then literal (not analyzed) washing (e.g., wash hands with soap and water), then joke dressing (e.g., putting hat under arm; see Appendix B for counterbalancing). This was to ensure there was no carry-over from one trial to the next. For instance, if a parent joked they were drinking on one trial, and on the next trial, literally drank, parents and toddlers might return to the joke drinking if they thought it was fun, and not distinguish the contexts. Parents and

children played with distractor objects (hammer bench, xylophone, ring stacker, one per trial, in that order) for one minute between trials.

Parents were not told to make, or refrain from making, additional actions or utterances. Children played with objects with their parents throughout the trials. The experimenter sat behind an occluder during the trials, and switched the objects between trials.

**Coding.** Videos were coded and transcribed using Observer software. All parents' utterances were coded throughout the trials as Target Sentences (the first time parents said a sentence we asked parents to say), or Belief Language, Disbelief Language, or Neither, in relation to the three Target Sentences (see Table 1 for examples of Belief and Disbelief Language across categories).

Belief Language could show:

1. General belief: e.g., for the Target Sentence, "I'm putting the glove on my hand." General Belief Language could be, "That's right." which confirms any sentence.
2. Specific belief: e.g., for the Target Sentence "I'm putting the glove on my hand." Specific Belief Language could involve repeating the original Target Sentence, or re-wording the original Target Sentence, e.g., "I'm getting my gloves on."
3. Build-on belief: e.g., for the Target Sentence, "I'm putting the glove on my hand." adding to the description beyond the Target Sentence so as to show belief in the premise, e.g., "These will keep me nice and warm." or "Does my glove fit nicely?"

Disbelief Language (Hoicka, et al., 2008) could show:

1. General disbelief: e.g., for the Target Sentence, "I'm putting the glove on my hand." General Disbelief Language could be, "That's wrong." which denies any sentence.

2. Specific disbelief: e.g., for the Target Sentence "I'm putting the glove on my hand." Specific Disbelief Language would involve re-wording the original statement to show that it breaks convention, e.g., "That's not how you put your gloves on your hands." or, "Am I putting the glove on my hand?"
3. Build-on disbelief: e.g., for the Target Sentence, "I'm putting the glove on my hand." adding to the description beyond the Target Sentence so as to show disbelief in the premise, e.g., "This is really a plastic envelope on my hand."

Belief and Disbelief Language had to refer to the Target Sentence, not just elements in the Target Sentence. So, for example, "I have five fingers." would not count as Belief Language as it is not about one's hand in relation to the glove. Questions were counted as Belief Language when the premise of the Target Sentence was assumed. For example, "Does my glove fit nicely?" would suggest they have accepted that they are wearing the glove. If instead the parent asked, "Am I putting the glove on my hand?" then this question would suggest disbelief in the initial premise (that they were putting a glove on their hand) and so would instead by coded as Disbelief Language.

Table 1

Examples of Belief and Disbelief Language and Actions across Studies.

| | Study 1 | Study 2 |
|---|---|---|
| Target Sentence | I'm going to eat this. | This is a train. |
| Belief Language | | |
| General | -That's right, clever boy [after child does eating action] | -That's right [after saying "choo choo"] |
| Specific | -I'm going to eat this [repetition]<br>-Look, Mummy is going to eat this | -This is a train [repetition]<br>-I think it is a train, darling [re- |

| | | |
|---|---|---|
| | [re-wording] | wording] |
| Build-on | - Is this a plate to put our food on? [builds on assumption they are eating] | -What noise does a train make [builds on assumption it is a train] |
| Disbelief Language | | |
| General | -That's not what you do [general rejection of the premise they are eating] | -You don't believe me, do you? [general rejection of the premise it's a train] |
| Specific | -Is there food on the plate? [questions whether really eating] | Is that a train? [questions whether it really is a train] |
| Build-on | -We don't eat on your forehead do we? [questions whether eating correctly] | None found, but a hypothetical example is: -But it doesn't have wheels [indirectly questions whether really a train] |
| Belief Action | | Moves forward on table [uses object like a train] |
| Disbelief Action | | Lifts to mouth [uses object as though it were not a train] |

Language was coded as Neither if it did not fall within the definitions above, i.e., if the utterance was not about the Target Sentence. This could occur if parents made unrelated utterances (e.g., child's behavior), or said other things about the objects, but not about the

Target Sentences themselves. Children's Negation (no, not, etc.), and Parents' and children's Target Actions (the actions we asked parents to model) were coded throughout each trial.

A second-coder, blind to the study's hypotheses, coded four transcripts (16%) for parents' language, coding every utterance as Belief Language, Disbelief Language, Target Sentence, or Other. Agreement was very good, $k = 0.95$. Agreement for child's Negation was not coded as word searches on the transcripts were used. Four videos (16%) were coded for parents' and children's actions, coding each action as a Target Action or not. Agreement was very good, $k = 0.83$.

**Results and Discussion**

One parent and child did not complete the Pretend trial, however they completed the Joke and Literal trials, so these trials were kept in the analyses. We used linear mixed models (LMM) to analyze all parents' behaviors and children's Target Actions. These are similar to repeated-measures ANOVA, but have the added benefit of allowing the inclusion of participants with missing data, and for controlling for Scenario, while increasing power by analyzing by item instead of by participant.

We used Logit Mixed Effects Models (LMEM) for children's Negation as the mean number of occurrences of the behavior was under one for each trial, thus we needed to use non-parametric statistics. LMEM allow repeated-measures non-parametric designs with missing data, and to control for random effects, while increasing power by analyzing by item instead of by participant (see Hoicka & Akhtar, 2011, and Jaeger, 2008, for more details). For all analyses, our Independent Variable was Action Type (Joke, Pretend, Literal). Difference contrasts compared Pretend to Joke and Literal trials; we checked for specific differences between Pretend and Joke trials, and between Pretend and Literal trials. This was because these were the two contrasts we were interested in (see introduction), and because, statistically, one can only run the (number of conditions-1), i.e., in this case, 2 contrasts. For

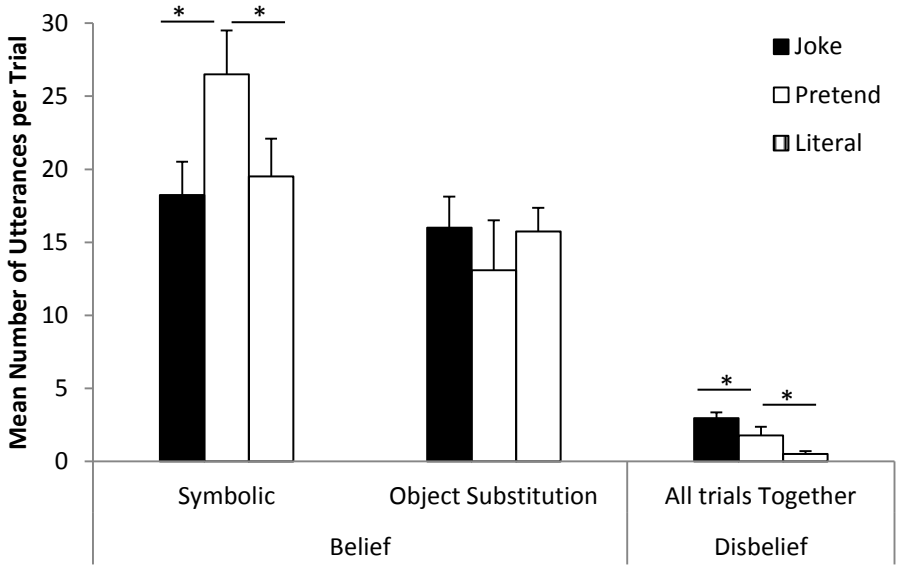
all analyses, Participant Number and Scenario were assigned as random variables. Interactions between Action Type and Child Gender, Child Age (<18 months; >18 months for LMEM based on median), and Pretense Type (Symbolic, Object Substitution) were included in models if significant. For Pretense Type, two Pretend trials involved Symbolic Pretense (Washing, Eating), while two Pretend trials involved Object Substitution Pretense (Dressing, Coloring). Therefore the distinction of Pretense Type is meaningful for the Pretense trials. However, in the Joke condition, all trials (Washing, Eating, Dressing, Coloring) involved Misusing Objects. Similarly, in the Literal condition, all trials were equally literal. Therefore the distinction of Pretense Type is not meaningful for the Joke or Literal trials since it does not distinguish the types of joking or literalness. Therefore the inclusion of Pretense Type only helps us better understand how parents might distinguish different types of pretending.

**Parents**

**Language.** Figure 1 shows Parents' Belief and Disbelief Language by Action Type (Joke, Pretend, Literal), and Pretense Type (Symbolic, Object Substitution; for Belief Language only). The best model, loglik = -458.90, N = 148, Pseudo-$R^2$ = 0.66, found 3-way interactions between Belief Type, Action Type (Joke, Pretend), and Pretense Type, OR = $7.07*e^{-6}$, t = -2.75, p = .0069; and between Belief Type, Action Type (Pretend, Literal), and Pretense Type, OR = 26903, t = 2.34, p = .0208. There were no significant interactions with Child Age or Child Gender.

To follow up the interactions, we analyzed Belief and Disbelief Language separately. The best model for Belief Language, loglik = -250.81, N = 74, Pseudo-$R^2$ = 0.22, found interactions between Action Type (Joke, Pretend), and Pretense Type, OR = 32827, t = 3.31, p = .0238, and between Action Type (Pretend, Literal), and Pretense Type, OR = 8400, t = 2.19, p = .0320. To follow up the interactions, we tested Symbolic and Object Substitution

trials separately. During Symbolic trials, loglik = -123.39, N = 35, Pseudo-$R^2$ = 0.15, Pretend trials elicited more Belief Language than Joke trials, OR = 2689, t = 2.44, p = .0205, and Literal trials, OR = 1249, t = 2.24, p = .0321. There was no difference between Action Types during the Object Substitution trials.




* p ≤.051

Figure 1. Parents' mean number of utterances classified as Belief and Disbelief Language by Action Type (Joke, Pretend, Literal), with Belief Language further divided by Pretense Type (Symbolic, Object Substitution) in Study 1. Errors bars represent standard errors.

The best model for Disbelief Language, loglik = -156.93, N = 74, Pseudo-$R^2$ = 0.20, found Joke trials elicited marginally more Disbelief Language than Pretend trials, OR = 3.22, t = 1.99, p = .0510, and Pretend trials elicited significantly more Disbelief Language than Literal trials, OR = 3.57, t = 2.16, p = .0341. There was no interaction between Action Type and Pretense Type for Disbelief Language.

Parents produced more Belief than Disbelief Language overall, OR = $1.36*e^7$, t = 18.57, p < .0001, regardless of Action Type. Symbolic (Dressing, Coloring) trials elicited more Disbelief than Belief Language compared to Object Substitution (Eating, Hand-Washing) trials, regardless of Action Type, OR = 910.23, t = 3.85, p = .0002.

**Target Actions.** The best model, loglik = -205.95, N = 74, Pseudo-$R^2$ = 0.16, found Pretend trials (M = 10.54, SD = 4.58) elicited more Target Actions than Joke trials (M = 6.40, SD = 3.73), OR = 57.72, t = 4.20, p = .0001. There was no difference between the Pretend and Literal trials (M = 9.64, SD = 4.38). There were no significant interactions with Child Age, Child Gender, or Pretense Type.

As predicted, parents showed more disbelief through their language, and less belief through their language and actions, when joking versus pretending. Parents showed more disbelief when pretending versus playing literally through their language. However, parents also showed more belief through their language during symbolic pretense versus literal play, but not during object substitution pretense versus literal play. This suggests that while object substitution pretending is seen only as breaking convention compared to literal acts, symbolic pretense is seen as both breaking and endorsing convention compared to literal acts. Interestingly, across all conditions, even in the joke condition, parents used more belief than disbelief language. Parents may thus have been keen to set up the joke and make sure their toddlers took note, before breaking the jokes down for their toddlers. Alternatively, it may be that parents refer more to reality even when joking and pretending, perhaps to maintain a general overall clarity of conversation, or because it is difficult to continually focus on the non-real.

### Children

**Negation.** Children produced Negation on 1 of 25 Joke trials (4%), 5 of 24 Pretend trials (24%), and 3 of 25 Literal trials (12%). There was no difference between trial types

(Joke, Pretend, Literal). There were no significant interactions with Child Age, Child Gender, or Pretense Type.

**Target Actions.** The best model, loglik = -186.65, N = 74, Pseudo-$R^2$ = 0.29, found Pretend trials (M = 5.13, SD = 4.34) elicited more Target Actions than Joke trials (M = 0.40, SD = 0.82), OR = 61.93, t = 5.03, p < .0001. There was no difference between Pretend and Literal trials (M = 5.72, SD = 4.90). There were no significant interactions with Child Age, Child Gender, or Pretense Type.

As predicted, like parents, children showed less belief through their actions when joking versus pretending, by producing fewer Target Actions. However, they did not show more disbelief through Negation. This may be because they were too young to use Negation (e.g., Choi, 1988; Hummer, et al., 1993). Alternatively, perhaps toddlers were unable to distinguish joking and pretending. However, this is less likely to be the case as they did distinguish joking and pretending through their Target Actions.

**Parent-Child Interactions**

In order to examine more closely how parents' cues predicted children's behaviors, a lag-sequential analysis (LSA) was run. This analysis allows one to determine which behaviors are more or less likely to follow other behaviors than chance within a large array of behaviors. See Bakeman and Gottman (1997), and Bakeman and Quera (1995), for detailed explanations of this analysis; or Montague, et al. (2011) for a concise introduction. We examined the effects of parents' Belief and Disbelief Language and parents' Target Actions, on children's Target Actions, as these were used by parents and children to distinguish conditions. We collapsed Target Sentences with Belief Language as they both convey belief from the child's viewpoint. We also included parents' and children's Other Actions (non-target actions) as controls for the Target Actions. We used a 5-second time lag (as actions are around 5 seconds long). Table 2 shows all frequencies, expected frequencies, conditional

probabilities, and adjusted residuals (AR) of each Behavior Type (e.g., Child Target Action) following each Behavior Type (e.g., Parent Belief Language) within 5 seconds, across all participants and conditions. The distribution of behaviors in Table 2 was significantly different than would be expected by chance alone, $\chi^2(8) = 30.49$, $p < .01$. ARs greater or equal to 1.96 suggest one behavior follows another more often than chance would predict ($p < .05$), while ARs smaller or equal to -1.96 suggest one behavior follows another less often than chance.

Table 2

Observed frequencies (top row, no brackets), expected frequencies (top row, in brackets), conditional probabilities (middle row) and adjusted residuals (bottom row) *of toddlers'* behavior types *following parents' behavior types within 5 seconds, across* all participants and conditions in Study 1.

| | Follows within 5 seconds | |
|---|---|---|
| | **Child** | |
| | Target Actions | Other Actions |
| **Parent** | | |
| Belief Language | 141(130) | 85(96) |
| | 62% | 38% |
| | (2.13)* | (-2.36)* |
| Disbelief Language | 11(13) | 11(9) |
| | 50% | 50% |
| | (-0.79) | (0.68) |
| Target Actions | 74(67) | 43(50) |
| | 63% | 37% |

| | | |
|---|---|---|
| | (1.41) | (-1.59) |
| Other Actions | 7(23) | 33(17) |
| | 17% | 83% |
| | (-9.78)* | (8.33)* |

*p < .05.

Children were more likely to perform Target Actions than chance within 5 seconds of parents producing Belief Language, but less likely after parents performed Other Actions. Children were more likely to perform Other Actions after parents performed Other Actions, but less likely after parents produced Belief Language. This suggests that, as predicted, parents' expression of belief encouraged children to show belief as well. However, against our predictions, parents' expression of disbelief had no immediate effect on children.

In order to examine whether child also influenced their parents, we examined the effects of children's behaviors on parents' behaviors. The distribution of behaviors in Table 3 was significantly different than would be expected by chance alone, $\chi^2(8) = 34.56$, $p < .01$.

Parents were more likely to perform Target Actions than chance within 5 seconds of children producing Target Actions, but less likely after children performed Other Actions. Parents were more likely to perform Other Actions after children performed Other Actions, but less likely after children performed Target Actions. Parents' language was not affected by children's actions. This may suggest that children's belief led parents to show more belief. However, it is also possible that parents were simply copying their children's actions, regardless of action type, since they did not show belief through their language as well.

Table 3

Observed frequencies (top row, no brackets), expected frequencies (top row, in brackets), conditional probabilities (middle row) and adjusted residuals (bottom row) of parents' behavior types following *toddlers'* behavior types within 5 seconds, across all participants and conditions in Study 1.

| | Follows within 5 seconds | | | |
|---|---|---|---|---|
| | **Parent** | | | |
| | Belief Language | Disbelief Language | Target Action | Other Action |
| **Child** | | | | |
| Target Action | 135(132) | 10(12) | 79 (63) | 11(29) |
| | 57% | 4% | 34% | 5% |
| | (0.65) | (-0.95) | (3.20)* | (-8.50)* |
| Other Action | 107(110) | 12(10) | 36(52) | 42(24) |
| | 54% | 6% | 18% | 21% |
| | (-0.66) | (0.79) | (-4.34)* | (3.98)* |

*$p < .05$.

## Study 2

In Study 2, parents were instructed to produce specific, scripted, verbal joking, pretending, and literal play with their 20- to 24-month-olds. The goals of Study 2 were to determine whether (1) the results of Study 1 extend to a later stage of development, and (2) father-toddler interactions are comparable to mother-toddler interactions in these contexts. Toddlers' language develops exponentially in the second year. Vocabulary increases dramatically from 16 to 24 months (Fenson, et al., 1994; Hamilton, et al., 2000). Due to this shift, toddlers' joking and pretending become more verbal. Toddlers mislabel objects as a

joke from 2 years, with jokes involving labelling one object as something very different (e.g., joking that a fork is a pig; Hoicka & Akhtar, 2011; McGhee, 1979). Toddlers also pretend through object substitution somewhat proficiently from 2 years when objects look dissimilar to the original objects, but have no obvious function, e.g., blocks (e.g., Elder & Pederson, 1978; Fein, 1975; Jackowitz & Watson, 1980). Thus we sought to examine whether parents offer cues to distinguish verbal (rather than action-based) joking and pretending with older toddlers, following age-appropriate forms of joking (mislabelling objects) and pretending (object substitution where substitutes have no obvious function), and whether older toddlers use parental cues to distinguish verbal (rather than action-based) joking and pretending themselves.

Additionally, fathers may provide more cues to distinguish joking and pretending as men may be more practiced at joking as they tell rehearsed jokes more often than women (Johnson, 1991). However, women tell more amusing personal anecdotes than men (Crawford & Gressley, 1991), and other studies of humor production do not find sex differences (e.g., Edwards & Martin, 2010), making it less clear if men really would be more practiced at being humorous. Additionally, fathers may provide fewer cues than mothers in general. While fathers produce infant-directed speech, which can scaffold infant language, their cues are less exaggerated than mothers' (Fernald, et al., 1989). Thus it is unclear whether fathers or mothers will provide more cues.

This study was not meant to directly replicate Study 1, but instead to examine whether parents continue to cue differences between joking and pretending at a later stage of development, using developmentally appropriate forms of joking and pretending. An interesting aspect of this stage of development is that children use object substitution both to pretend and to joke. However, they are quite discerning about the types of object substitutes that work well in pretense versus joke contexts. For instance, a 2-year-old would use a non-

descript object, such as a block, to represent a cup during pretend play, but would not use an object distinct in form and function, e.g., a car, as a cup (e.g., Elder & Pederson, 1978; Fein, 1975; Jackowitz & Watson, 1980). In contrast, a 2-year-old would joke that a car is a cup, an object distinct in form and function, although it is less clear whether a 2-year-old would joke that a non-descript object, such as a block, is a cup (e.g., Hoicka & Akhtar, 2011; McGhee, 1979).

**Method**

**Participants.** A separate group of 40 parents (19 fathers) and their toddlers (age M = 21 months, 12 days, range = 19 months, 22 days to 24 months 13 days; 21 boys) participated. Three additional participants were excluded because of poor sound quality on the videos. One child was Black and all other children were Caucasian. Most parents had a university degree. Participants were recruited as in Study 1.

**Materials.** The objects were different depending on the condition. In the literal trials, the objects matched the words (e.g., toy horse for horse). In the pretend trials, the objects were non-descript items such as blocks and sponges (e.g., round block for horse). In the joke trials, the objects were mismatched items (e.g., coat for horse). See Appendix C for the object and label pairings by condition. Two Sony digital camcorders recorded the sessions.

**Design.** This was a within subjects design. The independent variable was the Trial Type: Joke, Pretend, or Literal. The dependent variables included parents' Belief and Disbelief Language; parents' and children's Belief and Disbelief Actions; and children's Negation. Two other independent variables were examined for whether they interacted with the main independent variable: children's age, and parents' gender. For the LSA examining the effects of parent cues on children's behaviors, the independent variables were the parent dependent variables listed above. The dependent variables were the child dependent variables listed above, as well as Other Language as a control for Negation. For the LSA examining the

effects of children's cues on parents' behaviors, the independent and dependent variables were reversed. See next section for counter-balancing.

**Procedure and Counterbalancing.** Before the study, parents were only told that we were interested in discovering how parents and toddlers interact when playing, including when the joke and pretend. Therefore the hypotheses were not disclosed. Each parent and toddler sat at a table, with the parent in a chair, and the toddler in a high chair. Parents acted out four blocks of four 30-second trials for a total of 16 trials: Joke, Pretend, Literal, and a fourth literal trial type run for another study (see Study 1). Before each block parents were told, "I'm going to give you four toys, one at a time." Each object (e.g., either shoe, block, or chicken, for Literal, Pretend, and Joke trials respectively) was given with an accompanying Target Sentence (e.g., "This is a shoe.") Parents were then told either, Literal: "Feel free just to play with the toy with your child."; Pretend: "This time it's pretending. So if you could pretend that this [point to object, e.g., block] is this [point to target sentence; e.g., "This is a shoe"] then that would be great."; Joking: "This one's joking so it's about using the objects in the wrong way, so if you could joke around that this [point to object, e.g., chicken] is this [point to target sentence, e.g., "This is a shoe"] then that would be great." Children could have heard these general instructions, however it seems unlikely that they would show a greater effect than parents' interactions themselves. We chose to instruct parents to show their excitement and happiness in the Literal condition to control for positive emotion across conditions, as in Study 1.

Joke, Pretend, Literal, and the other literal trial types were crossed with each of four sets of object labels, each set containing the word for an animal, vehicle, clothing item, and eating item. Parents acted out a subset of all the condition-label set pairings. For example, one parent would joke with Set 1 (Coat="Horse", Chicken="Hat", Plate="Train", Airplane="Spoon"), then play literally (not analyzed) with Set 2 (Cow, Shoe, Boat, Fork),

play literally (analyzed) with Set 3 (Dog, Bib, Bus, Cup), then pretend with Set 4 (Round Block=”Pig”, Bath Scrub = “Sock”, Scrunchy Hairband = “Car”, Square Block=“Bowl”). However, another parent would play literally (analyzed) with Set 4 (Pig, Sock, Car, Bowl), then joke with Set 3 (Coat=”Dog”, Chicken=”Bib”, Plate=”Bus”, Airplane=”Cup”), then pretend with Set 2 (Round Block=”Cow”, Bath Scrub = “Shoe”, Scrunchy Hairband = “Boat”, Square Block=“Fork”), then play literally (not analyzed) with Set 1 (Horse, Hat, Train, Spoon; see Appendix D for counterbalancing). Across all parents, all combinations of condition, set, and order were acted out. Parents and children played with distractor objects for one minute between blocks (same as Study 1).

Target Sentences were the same across trials to allow experimental control – any differences in responses by parents and children would be attributed to how the Objects related to the Target Sentences, and could not be attributed to the Target Sentences alone. While using specific sentences and objects gave better experimental control, it may have made the study less naturalistic. However, this was deemed necessary to avoid confounds, and parents appeared to act naturally throughout the study regardless. Since these instructions were written on paper kept away from the child, children only learned about this information through their parents. Additionally, it was necessary to use different objects across conditions. For instance, if we had used a toy train for the trial where parents say, “This is a train.” in all three conditions, it would be difficult for a parent to pretend or joke that it was a train because it literally was a train. Thus we chose, in this instance, a scrunchy hairband in the pretend condition, and a plate in the joke condition, so that utterances would be non-literal. Additionally, objects were different in the pretend and joke conditions because, as stated in the introduction for Study 2, 2-year-olds pretend with objects with no obvious functions, therefore a plate would not be suitable for pretending. Similarly, we discussed that 2-year-olds joke with objects that are quite distinct, e.g., joking a car is a hat, and using an

ambiguous object therefore might not have good comedic effect. It was thus necessary to use different types of objects so that parents could express pretending and joking in age-appropriate ways.

Parents were not told to make, or refrain from making, additional actions or utterances. Children played with the objects with their parents throughout the trials. The experimenter sat behind an occluder during the trials, and switched the objects between trials. Study 2 was filmed as in Study 1.

**Coding.** Videos were coded as in Study 1. Belief Language and Actions involved showing belief that the Target Sentence related to the object. For example, parents could show belief that any object is a shoe (shoe, chicken, block) by putting the object on their foot, or saying, e.g., "I'm tying up the laces." Disbelief language and actions involved showing disbelief that the Target Sentence related to the object. For example, parents could show disbelief that any object is a shoe (shoe, chicken, block) by putting the object on their head, or by saying, "That's not a shoe!" Belief and Disbelief Actions could also be modelled as gestures, e.g., making a "spooning" gesture to one's mouth. Belief and Disbelief Actions were coded in regards to the label given – to see how much parents did or did not endorse the label within each condition. Table 1 gives examples of Belief and Disbelief Language and Actions produced.

A second-coder, blind to the study's hypotheses, coded 6 (15%) transcripts for language, and 6 (15%) videos for parents' and toddlers' actions. Agreement was very good, $k = 0.88$, for language, and $k = 0.94$ for actions.

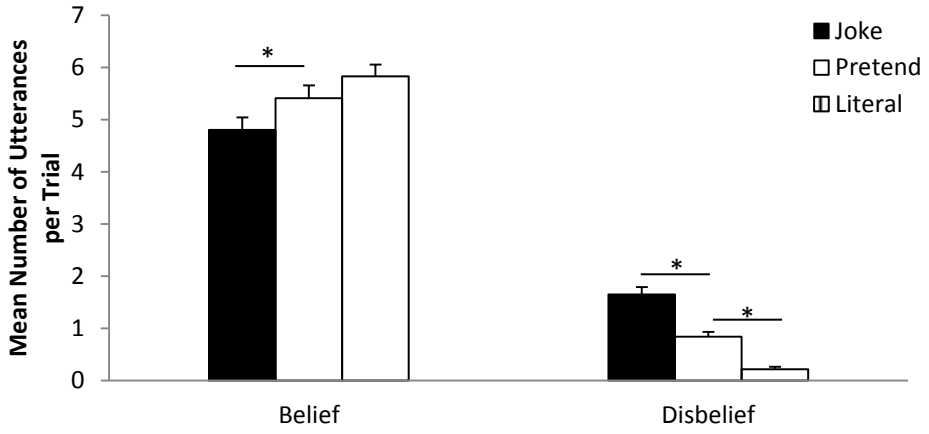
**Results and Discussion**

Up to 160 trials could be analysed per condition (40 participants X 4 trials). Across participants, 7 Joke trials and 9 Literal trials were not completed, leaving 153 Joke trials, 160 Pretend trials, and 151 Literal trials for analysis. LMM were used for parents' Belief

Language. LMEM were used for all other analyses, as the mean number of occurrences of the behaviors was under one for each trial. For all analyses, the Independent Variable was Trial Type (Joke, Pretend, Literal). Difference contrasts compared Pretend to Joke and Literal trials. For all analyses, Participant Number and Object Label were assigned as random variables. Interactions of Trial Type with Child Gender, Parent Gender, and Child Age (≤21 months, >21 months when using LMEM, based on the median) were included in final models if significant.

**Parents**

**Language.** Figure 2 shows Parents' Belief and Disbelief Language by Trial Type (Joke, Pretend, Literal). The best model, loglik = -2029.60, N = 928, Pseudo-$R^2$ = 0.46, found an interaction between Language Type (Belief, Disbelief) and Trial Type (Joke, Pretend), OR = 4.13, t = 4.28, p < .0001, and between Language Type and Trial Type (Pretend, Literal), OR = 2.83, t = 3.13, p = .0018. There were no significant interactions with Child Age, Child Gender, or Parent Gender.

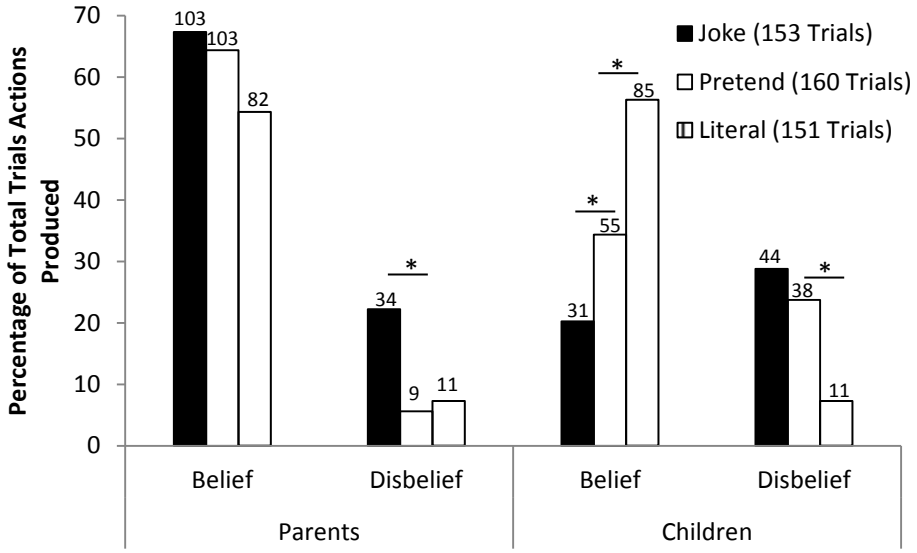



* p < .05

Figure 2. Parents' mean number of utterances expressing Belief and Disbelief Language by Trial Type (Joke, Pretend, Literal) in Study 2. Errors bars represent standard errors.

To follow up these interactions we tested Belief and Disbelief Language separately. The best model for Belief Language, loglik = -1096.30, N = 464, Pseudo-$R^2$ = 0.02, found Pretend trials elicited more Belief Language than Joke trials, OR = 1.76, t = 2.15, p = .0323. No difference was found between Literal and Pretend conditions. The best model for Disbelief Language, loglik = -783.62, N = 464, Pseudo-$R^2$ = 0.19, found Joke trials elicited more Disbelief Language than Pretend trials, OR = 2.24, t = 6.52, p < .0001, and Pretend trials elicited more Disbelief Language than Literal trials, OR = 1.87, t = 5.04, p < .0001. Additionally, Parents produced more Belief than Disbelief Language overall, OR = 85.01, t = 32.63, p < .0001, regardless of Trial Type.

**Actions.** Figure 3 shows parents' Belief and Disbelief Actions by Trial Type. The best model, loglik = -438.14, N = 928, found an interaction between Action Type (Belief, Disbelief) and Trial Type (Joke, Pretend), OR = 4.99, p = .0013. There was no interaction between Action Type and Trial Type (Pretend, Literal). There were no significant interactions with Child Age, Child Gender, or Parent Gender.




* p < .05

Figure 3. Percentage of trials during which parents and toddlers made Belief and Disbelief Actions by Trial Type (Joke, Pretend, Literal) in Study 2. No errors bars are used as

statistics are non-parametric. Numbers over bars indicate the total number of trials that actions were identified out of the total number of trials analyzed for the Trial Type (in the legend).

To follow up the interaction we tested Belief and Disbelief Actions separately. The best model for Belief Actions, loglik = -296.23, N = 464, found no effect of Trial Type. The best model for Disbelief Actions, loglik= -146.15, N = 464, found Joke trials elicited more Disbelief Actions than Pretend trials, OR = 5.64, $p < .0001$. Joke trials also elicited more actions of either type (Belief and Disbelief combined) than Pretend trials, OR = 2.68, $p < .0001$. Parents were more likely to produce Belief than Disbelief Actions overall, OR = 22.32, $p < .0001$, regardless of Trial Type.

As in Study 1, and as predicted, parents showed more disbelief and less belief, through language, and more disbelief through their actions, when joking versus pretending. Thus even when joking and pretending are quite similar in form, parents still distinguish them. Replicating the object substitution results of Study 1, parents also showed more disbelief through their language when pretending versus playing literally, suggesting disbelief in the pretend premise to some extent. Again, as in Study 1, parents showed more belief than disbelief, both through language and actions, across all three conditions, even joking. Parent gender had no effect on how parents display their belief or disbelief. Therefore mothers and fathers interact in similar ways with their toddlers in terms of distinguishing contexts.

**Children**

**Negation.** The best model, loglik = -190.18, N = 464, found Pretend trials (22%; 35/160 trials) were more likely to elicit Negation than Literal trials (10%; 15/151 trials), OR = 5.06, p = .0078. There was no main effect distinguishing Pretend and Joke trials (24%; 36/153 trials). However, an interaction found Joke trials were more likely to elicit Negation

than Pretend trials for older compared to younger children, OR = 4.18, p = .0252. Additionally, older children were more likely to produce Negation than younger children overall, OR = 2.98, p = .0491. There were no significant interactions with Child Gender or Parent Gender.

**Actions.** Figure 3 shows children's Belief and Disbelief Actions by Trial Type. The best model, loglik = -489.17, N = 928, found an interaction between Action Type and Trial Type (Joke, Pretend), OR = 3.08, p = .0029, and between Action Type and Trial Type (Pretend, Literal), OR = 11.07, p < .0001. There were no significant interactions with Child Age or Parent Gender.

To follow up the interactions we tested Belief and Disbelief Actions separately. The best model for Belief Actions, loglik = -275.48, N = 464, found Pretend trials elicited more Belief Actions than Joke trials, OR = 2.39, p = .0016, and Literal trials elicited more Belief Action than Pretend trials, OR = 2.61, p < .0001. The best model for Disbelief Actions, loglik = -213.44, N = 464, found Pretend trials elicited more Disbelief Actions than Literal trials, OR = 4.40, p < .0001.

Children were more likely to produce Belief than Disbelief Actions overall, OR = 2.86, p < .0001, regardless of Trial Type. Pretend trials were more likely to elicit actions of either type than Joke trials for girls compared to boys, OR = 2.63, p = .0109. Pretend trials were more likely to elicit Belief Actions than Joke trials for girls compared to boys, OR = 4.11, p = .0109.

As in Study 1, and as predicted, toddlers showed less belief when joking versus pretending by producing fewer Belief Actions in the joking context. Older toddlers also showed more disbelief by producing more Negation during joke versus pretend contexts. For the first time, children showed more disbelief, and less belief, during pretend versus literal trials. In particular, they were more likely to produce Disbelief Actions and Negation, and

less likely to produce Belief Actions during pretend versus literal trials. This could be due to the pretense type (object substitution focussing on language). However children did not object verbally in Study 1 to a similar type of pretense (object substitution focussing on actions). Given that older toddlers were more likely to use negation than younger toddlers, this may be due to toddlers becoming better at using negation with age (e.g., Choi, 1988; Hummer, et al., 1993).

Parent gender had no effect on how children display their belief or disbelief. Girls were more likely to perform actions in general during pretend versus joke trials than boys. Crucially, however, there was no 3-way interaction of child gender, trial type, and action type. Thus child gender had no effect on how children assigned belief and disbelief to joke and pretend contexts. Rather, girls were perhaps more engaged in pretending than joking compared to boys. The only effects of children's age had to do with negation. Children of all ages were more likely to use negation during literal versus pretend trials. However, older children were more likely to use negation in general, and, more specifically, older children were also more likely to use negation during joke versus pretend trials. This may mark either a better awareness of the distinction of joking versus pretending older toddlers, a better ability to use negation appropriately (e.g., Choi, 1988; Hummer, et al., 1993), or both.

**Parent-Child Interactions.**

In order to examine more closely how children were affected by parents' cues, a LSA was run as in Study 1. Table 4 shows the total frequency, expected frequency, conditional probability, and residual of each Behavior Type following each Behavior Type . We examined the effects of parents' Belief and Disbelief Language and Actions on children's Belief and Disbelief Actions, and Negation, as these were used by parents and children to distinguish trials. We collapsed Target Sentences with Belief Language as in Study 1. We also included children's Other Utterances (non-negation) as controls for Negation. The

distribution of behaviors in Table 4 was different than would be expected by chance alone, $\chi^2(16) = 37.22$, $p < .01$.

Children were more likely to perform Belief Actions after parents performed Belief Actions, but less likely after parents produced Disbelief Language. Children were less likely to produce Negation after parents produced Belief Language. Additionally, children were less likely to produce Other Utterances after parents produced Belief Actions, but more likely after parents produced Disbelief Statements.

As in Study 1, parental cues appear to influence children's behaviors. Specifically, children's ability to distinguish joke, pretending, and literal contexts through Belief Actions and Negation could be explained by children responding to parental cues. Additionally, just as children in this age range are becoming better at using Negation themselves, they may also be becoming better at interpreting others' Disbelief Language, since children did not respond to this in Study 1. It is interesting that parents Disbelief Language encouraged children's Other Language, while Belief Language discouraged it. This converges with evidence that Disbelief Language encourages toddlers to talk in general (Hoicka, et al., 2008), and adds to this evidence by showing belief (through actions) discourages toddlers' general talk. Therefore Disbelief Language may be a good way to engage toddlers in conversation more generally. Additionally, children's Disbelief Actions were not explained by the model. Children may have picked up on other parental cues not coded in this study, or they may have noticed differences in contexts on their own.

In order to examine whether child also influenced their parents, we examined the effects of children's behaviors on parents' behaviors. The distribution of behaviors in Table 5 was different than would be expected by chance alone, $\chi^2(16) = 27.49$, $p < .05$.

Table 4

Observed frequencies (top row, no brackets), expected frequencies (top row, in brackets), conditional probabilities (middle row) and adjusted residuals (bottom row) of *toddlers'* behavior types following *parents'* behavior types within 5 seconds, across all participants and conditions in Study 2.

| | Follows within 5 seconds | | | |
|---|---|---|---|---|
| | **Child** | | | |
| | Belief Action | Disbelief Action | Negation | Other Language |
| **Parent** | | | | |
| Belief Language | 240(229) | 74(67) | 108(128) | 564(562) |
| | 24% | 8% | 11% | 57% |
| | (1.42) | (1.34) | (-3.47)* | (0.21) |
| Disbelief Language | 29(50) | 12(15) | 37(28) | 138(123) |
| | 13% | 6% | 17% | 64% |
| | (-4.83)* | (-0.90) | (1.72) | (2.08)* |
| Belief Action | 80(64) | 15(19) | 43(36) | 138(157) |
| | 29% | 5% | 16% | 50% |
| | (2.26)* | (-1.15) | (1.31) | (-2.78)* |
| Disbelief Action | 0(6) | 2(2) | 7(3) | 18(15) |
| | 0% | 7% | 26% | 67% |
| | (NA) | (0.11) | (1.43) | (0.95) |

*$p < .05$.

Table 5

Observed frequencies (top row, no brackets), expected frequencies (top row, in brackets), conditional probabilities (middle row) and adjusted residuals (bottom row) of *parents'* behavior types following *toddlers'* behavior types within 5 seconds, across all participants and conditions in Study 2.

| | Follows within 5 seconds | | | |
|---|---|---|---|---|
| | **Parent** | | | |
| | Belief Statement | Disbelief Statement | Belief Action | Disbelief Action |
| **Child** | | | | |
| Belief Action | 217(201) | 22(43) | 55(47) | 0(3) |
| | 74% | 7% | 19% | 0% |
| | (2.15)* | (-5.35)* | (1.36) | (NA) |
| Disbelief Action | 70(579) | 23(17) | 19(18) | 3(1) |
| | 61% | 20% | 17% | 2% |
| | (-1.92) | (1.48) | (0.18) | (1.00) |
| Negation | 81(90) | 26 (19) | 22(21) | 3(2) |
| | 61% | 20% | 17% | 2% |
| | (-1.92) | (-1.52) | (0.24) | (0.88) |
| Other Language | 621(619) | 139(131) | 134(144) | 11(11) |
| | 69% | 15% | 15% | 1% |
| | (0.24) | (1.14) | (-1.53) | (0.18) |

*$p < .05$.

Parents were more likely to say Belief Statements and less likely to say Disbelief Statements than chance within 5 seconds of children producing Belief Actions. Parents'

actions were not affected by children. This may suggest that parents reinforced children's belief actions by expressing more belief, and avoiding expressing disbelief.

## General Discussion

### Parents' Explicit Cues

Our first goal was to determine whether parents give explicit cues to help toddlers distinguish joke and pretend intentional contexts. Across both studies, parents showed more disbelief, or less belief, through their language and actions when joking versus pretending. Therefore both studies show that in multiple contexts (action play, verbal play), with multiple types of joking and pretending, and multiple age groups (spanning 16 to 24 months), parents give explicit cues to distinguish joke and pretend intentional contexts. These findings converge with theoretical definitions of joking and pretending, which suggest pretending follows conventions given some assumptions, while joking can simply involve breaking conventions (e.g., Hoicka & Gattis, 2008; Hoicka, et al., 2008; Nichols & Stich, 2003). These findings also extend research suggesting parents show disbelief when joking, but perhaps not when pretending (Hoicka & Gattis, 2012; Hoicka, et al., 2008; Lillard, et al., 2007; Lillard & Witherington, 2004).

It was not our goal to determine whether parents cue the differences between joking and pretending more or less alongside development. Rather, the goal was to see whether cues exist for different stages of development. However, it is interesting to note that parents cued the difference between joking and pretending, regardless of toddlers' age. Indeed, within each study, there were no effects of toddlers' age on parents' use of cues. This suggests there are no clear developmental changes in parental cuing in the 2nd year. However, future research could compare parental cuing in a larger age range.

One question is whether parents showed more disbelief and less belief when joking versus pretending because parents were instructed to do an action/use an object the wrong

way. We chose these instructions to clarify the instructions for the jokes. This may have led them to highlight the broken conventions with increased disbelief and decreased belief. While this is possible, two arguments speak against this. First, in a book-reading study, parents who read a humorous book, but who were not given explicit instructions to say something wrong, nevertheless expressed more disbelief language than parents who read a literal book (Hoicka, et al., 2008). Therefore parents do spontaneously show more disbelief when joking, even without explicit instructions. Second, by giving parents explicit instructions to do the wrong thing, parents could equally have wanted to comply by joking more, and hence showing more belief in the acts (e.g., by repeating the jokes). In order to comply, they may also have avoided performing conventional acts (e.g., saying "That's really a shoe!") since the instructions were to do the wrong thing, not to follow conventions. Thus the instructions could have made them show less disbelief (e.g., by avoiding conventional acts). Therefore it is also possible these instructions stopped parents form making as many belief or disbelief statements as they typically would.

This data adds to research finding parents use implicit cues to express humor, including exaggerated infant-directed speech (IDS) and a rising linear contour (Hoicka & Gattis, 2012), and laughter (Mireault, et al., 2011). It also converges with research finding parents distinguish joking and pretending with implicit cues, including smiling, infant-directed speech, and gaze to the child (Hoicka, 2015). However, in that study, it was suggested implicit cues were used for attention grabbing in difficult situations, and to express positive emotion more generally. Thus while implicit cues may help guide toddlers' attention, the explicit cues measured in this study may guide toddlers' understanding of joking and pretending.

**Children's Responses**

Our second goal was to determine whether parents' explicit cues guide toddlers to distinguish joke and pretend intentional contexts. Both studies suggest children, like parents, distinguish joking and pretending. Children were less likely to produce target actions during joke versus pretend trials in Study 1, and less likely to produce belief actions during joke versus pretend trials in Study 2. This extends research finding children are more likely to laugh when being read a humorous versus literal book (Hoicka, et al., 2008), and experimental evidence finding toddlers from 19 months distinguish jokes and mistakes (Hoicka & Gattis, 2008; Hoicka & Akhtar, 2011). This also converges with experimental research showing 2- and 3-year-olds are more likely to object to joking than pretending (Hoicka & Martin, 2015).

Across both studies, parents' belief, through language or actions, increased the likelihood that children would perform target or belief actions, while in Study 2, parents' disbelief language decreased the likelihood. Given that children's target and belief actions were predicted by parental cues, the ability to distinguish these contexts appears to be directly related to parental cues. This research converges with evidence that parents' explicit cues help children learn in other contexts (Hoicka, et al., 2008; Mireault, et al., 2012; Nakamichi, in press; Reddy, 2001). Most relevantly, toddlers whose parents provide more pretense cues at 18 months better understood adults' pretend actions at 24 months (Nakamichi, in press). Toddlers spoke more when parents produced more disbelief language during book reading, suggesting disbelief language encourages active engagement in toddlers, potentially providing active learning opportunities (Hoicka, et al., 2008). Finally, infants were more likely to laugh or re-produce strange actions when parents laughed (Mireault, et al., 2012; Reddy, 2001).

While children responded to joking and pretending, and to their parents cues, mostly in similar ways across both studies, there was one interesting area of development. Only toddlers in Study 2 responded to parents' disbelief language. It was also in this study that toddlers began to use negation appropriately (to distinguish pretend versus literal conditions, and older children did so to distinguish joking and pretending – see next section). Thus it is possible that children use parents' cues to disbelief more as they get closer to 2 years, perhaps as they start to understand concepts relating to negation more generally (e.g., Choi, 1988; Hummer, et al., 1993). Future research should examine this possibility.

**Pretend versus Literal Trials**

At the outset, we suggested four possibilities for how parents might distinguish pretending versus playing literally. Parents might (1) show more disbelief as the acts technically break convention (e.g., Hoicka, et al., 2008); (2) show more belief as previous research suggests (e.g., Lillard, et al., 2007; Lillard & Witherington, 2004); (3) show no difference in behaviors as pretending might be thought of as literal once the pretend context is established (Nichols & Stich, 2003; Sutherland & Friedman, 2012); or (4) a combination of differences in both directions as pretense both breaks convention (technically) and is conventional (in one's imagination) at the same time (e.g., Hoicka, et al., 2008; Nichols & Stich, 2003).

Our results varied depending on the type of pretense used. In Study 1, when symbolic pretense was used, parents increased their use of belief language when pretending versus being literal, in line with findings from Lillard (Lillard, et al., 2007; Lillard & Witherington, 2004). However, parents also increased their use of disbelief statements. Therefore parents appear to express symbolic pretending as both endorsing and breaking conventions at the same time (e.g., Hoicka, et al., 2008; Nichols & Stich, 2003). In contrast, in both studies, when object substitution pretense was used, parents increased their use of disbelief

statements, but showed no difference in their use of belief statements, nor in their use of target or belief actions (or their disbelief actions). Therefore parents appear to express object substitution pretending as breaking convention (although not to the same extent as joking, see above, e.g., Hoicka, et al., 2008; Nichols & Stich, 2003). This highlights potential ambiguity in describing different types of pretending under the same umbrella. One possible reason parents treated these two types of pretending differently is that parents may have seen symbolic pretense as more literally true than object substitution, since the features of symbolic pretense share more in common with the conventional acts, e.g., putting an empty cup to one's mouth is similar to the conventional act of putting a (full) cup to one's mouth (symbolic). In contrast, putting a plastic tube around one's next as a scarf may seem more removed from convention (object substitution). A second possibility is that parents thought toddlers could grasp the representational nature of symbolic pretense better than object substitution, and so were more keen to emphasise the representational aspects of symbolic pretense (through belief language), instead of focussing on the fact that it technically breaks convention.

It was not the case that parents only ever expressed pretending as more believable than literal play, seemingly going against Lillard's original findings. It is important to note, however, that Lillard, et al., (2007) and Lillard and Witherington (2004) never interpreted their findings as being related to belief or disbelief. Thus while parents made more references to the absent objects (e.g., cheerios) in their study, perhaps the references involved a combination of belief and disbelief language, e.g., "I'm going to eat cheerios."; "I'm not really eating cheerios."

This research also extends findings that parents use a variety of other cues when pretending versus acting literally. These cues include exaggerating features of infant-directed speech, including mean pitch and pitch variation when pretending versus acting literal

(Lillard, et al., 2007; Reissland & Snow, 1996). Other cues include increasing the use of sound effects, gazing to the child, and, sometimes, smiling, when pretending versus joking (Lillard, et al., 2007; Lillard & Witherington, 2004).

In Study 2, like parents, toddlers also viewed pretending as breaking convention more than literal play, with pretend trials eliciting more disbelief actions and negation, and fewer belief actions than literal trials. Therefore, even toddlers see object substitution pretense as breaking conventions to some extent. However, in Study 1, children did not distinguish these contexts, even during object substitution. Two possibilities could explain this discrepancy. First, older toddlers may find it easier to distinguish pretending and literal play than younger toddlers. In future, an experiment could be run between age groups to determine whether this is the case. Second, the object substitution used in Study 1 involved objects similar in shape to the literal objects (e.g., sticks for crayons), while the object substitution used in Study 2 involved objects different in shape to the literal objects (e.g. scrunchy hairband for train). Thus perhaps toddlers in Study 1 did not notice the objects were unconventional, while the toddlers in Study 2 did.

**The Non-Literal World**

This research shows parents cue toddlers to information that is technically false, and toddlers pick up on the idea that information is false. Thus understanding that information can be false, may be scaffolded by parents. This exchange occurred most strongly in joking contexts. This suggests that, at least compared to pretend and literal contexts, joking provides the best introduction for children to engage with the non-literal world. This converges with theory suggesting humor should be cognitively easier to grasp than other forms of falsehood, including pretense, lying, metaphor, and irony; and a corpus analysis showing humor is more prevalent in books aimed at 1-year-olds than other forms of falsehood (Hoicka & Gattis, 2008; Hoicka, et al., 2008), and research showing some understanding of humor is present in

the first year (Hoicka & Akhtar, 2012; Mireault, et al., 2012; Reddy, 2001). The current studies thus provide evidence that sharing humor could be the gateway to non-literal thought in early development.

**Complex Intentions**

The current research may highlight how toddlers come to understand and distinguish complex intentions. Understanding intentions is an important milestone which may allow toddlers to learn language, use artefacts, and hence allow cultural transmission (e.g., Tomasello, 2001). Research suggests toddlers understand intentions from 14 months (e.g., Carpenter, Akhtar, & Tomasello, 1998; Gergely, Bekkering, & Király, 2002; Meltzoff, 1995). However, while toddlers understand intentions to follow conventions early on, it takes them longer to understand intentions to break conventions. Toddlers do not understand intentions to joke until 25 months (Hoicka & Gattis, 2008), nor intentions to pretend until 36 months (Rakoczy, Striano, & Tomasello, 2004). Given the extensive cues parents produce for their toddlers, it is possible children need time to absorb this information in order to fully understand these types of intentions.

Additionally, given that cues to joking were more overt than cues to pretending, this might explain why children need an additional year to understand intentions to pretend versus intentions to joke. The fact that parents produce more cues showing disbelief when joking versus pretending may help toddlers understand intentions to joke much earlier than intentions to pretend. Future research should explore this potential link.

**Conclusions**

This research found parents offer explicit cues to help distinguish joke and pretend intentional contexts. Parents showed more disbelief and less belief through their language and actions when joking versus pretending. Toddlers in both studies were also able to distinguish joke and pretend contexts through their actions. Toddlers showed less belief through their

actions during joke versus pretend contexts. In both studies, their ability to distinguish joking and pretending could be explained, at least in part, by toddlers' responses to parents. Toddlers were less likely to perform actions suggesting belief when parents expressed less belief. Older toddlers were also less likely to produce actions showing belief when parents made utterances suggesting disbelief. This set of studies thus reveals a mechanism by which toddlers learn to distinguish joking and pretending. Parents offer cues to distinguish the intentions, and toddlers take advantage of these cues to perform behaviors which distinguish these intentional contexts.

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Appendix A

Target Sentences and Target Actions across Action Types (Joke, Pretend, Literal) for Study 1.

| Set | Target Sentence | Target Actions & Objects | | |
|---|---|---|---|---|
| | | Literal | Pretend | Joke |
| Washing | I'm squeezing out the soap | Squeeze bottle of liquid soap | Squeeze empty bottle | Squeeze bottle of liquid soap with elbows |
| | I'm washing my hands | Wash hands in bucket of soapy water | Pretend to wash hands in empty bucket | Put foam on own nose from bucket of soapy water |
| | I'm drying my hands | Dry hands with towel | Pretend to dry hands with towel | Rub towel on own head |
| Eating | I'm going to eat this | Eat some cookies from plate | Pretend to eat from plate | Put rice cake pieces on own forehead |
| | I'm pouring myself a drink | Pour orange drink from bottle into cup | Pretend to pour a drink from empty bottle to empty cup | Hold bottle of water over own head |
| | I'm going to have a drink | Take a sip from cup of orange drink | Pretend to have a sip from empty cup | Put cup of water to elbow |
| Dressing | I'm putting the hat on | Put hat on own | Put sponge on | Put hat under own |

| | | | | |
|---|---|---|---|---|
| | my head | head | own head | arm |
| | I'm putting the scarf around my neck | Put scarf around own neck | Put rubber tube around own neck | Put scarf on top of own head |
| | I'm putting the gloves on my hands | Put glove on own hand | Put plastic wallet on own hand | Put glove on own elbow |
| Coloring | Here are some crayons | Pick up crayon from table | Pick stick up from table | Hold crayon with elbow |
| | This is how you color | Coloring with colorful crayons on colored paper with lots of shapes | Pretend to color with stick on white paper with one big shape | Put white paper with one big shape on own head and color with black crayons |
| | I'm coloring in the shape | Coloring in shapes with crayons | Pretend to color with stick on white paper with one big shape | Put crayon on own nose |

Appendix B

Counterbalancing of Study 1.

| | Trial | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Order | | | | |
| 1 | Joke | NA | Literal | Pretend |
| | Washing | Eating | Dressing | Coloring |
| 2 | NA | Pretend | Joke | Literal |
| | Washing | Eating | Dressing | Coloring |
| 3 | Literal | Joke | Pretend | NA |
| | Washing | Eating | Dressing | Coloring |
| 4 | Pretend | Literal | NA | Joke |
| | Washing | Eating | Dressing | Coloring |
| 5 | Joke | NA | Literal | Pretend |
| | Eating | Coloring | Washing | Dressing |
| 6 | NA | Pretend | Joke | Literal |
| | Eating | Coloring | Washing | Dressing |
| 7 | Literal | Joke | Pretend | NA |
| | Eating | Coloring | Washing | Dressing |
| 8 | Pretend | Literal | NA | Joke |
| | Eating | Coloring | Washing | Dressing |
| 9 | Joke | NA | Literal | Pretend |
| | Dressing | Washing | Coloring | Eating |
| 10 | NA | Pretend | Joke | Literal |
| | Dressing | Washing | Coloring | Eating |

| | | | | |
|---|---|---|---|---|
| 11 | Literal | Joke | Pretend | NA |
| | Dressing | Washing | Coloring | Eating |
| 12 | Pretend | Literal | NA | Joke |
| | Dressing | Washing | Coloring | Eating |
| 13 | Joke | NA | Literal | Pretend |
| | Coloring | Dressing | Eating | Washing |
| 14 | NA | Pretend | Joke | Literal |
| | Coloring | Dressing | Eating | Washing |
| 15 | Literal | Joke | Pretend | NA |
| | Coloring | Dressing | Eating | Washing |
| 16 | Pretend | Literal | NA | Joke |
| | Coloring | Dressing | Eating | Washing |

NA = Not Applicable; Literal page included for another study

Appendix C

Target Sentences and objects across Trial Types (Joke, Pretend, Literal) for Study 2.

| Set | Target Sentence | Literal Object | Pretend Object | Joke Object |
|---|---|---|---|---|
| 1 | This is a horse | Horse | Round block | Coat |
| | This is a hat | Hat | Bath scrub | Chicken |
| | This is a train | Train | Scrunchy hairband | Plate |
| | This is a spoon | Spoon | Square block | Airplane |
| 2 | This is a cow | Cow | Round block | Coat |
| | This is a shoe | Shoe | Bath scrub | Chicken |
| | This is a boat | Boat | Scrunchy hairband | Plate |
| | This is a fork | Fork | Square block | Airplane |
| 3 | This is a dog | Dog | Round block | Coat |
| | This is a bib | Bib | Bath scrub | Chicken |
| | This is a bus | Bus | Scrunchy hairband | Plate |
| | This is a cup | Cup | Square block | Airplane |
| 4 | This is a pig | Pig | Round block | Coat |
| | This is a sock | Sock | Bath scrub | Chicken |
| | This is a car | Car | Scrunchy hairband | Plate |
| | This is a bowl | Bowl | Square block | Airplane |

Appendix D

Counterbalancing of Study 2.

| | Block | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Order | | | | |
| 1 | Joke | NA | Literal | Pretend |
| | Set 1 | Set 2 | Set 3 | Set 4 |
| 2 | NA | Pretend | Joke | Literal |
| | Set 1 | Set 2 | Set 3 | Set 4 |
| 3 | Literal | Joke | Pretend | NA |
| | Set 1 | Set 2 | Set 3 | Set 4 |
| 4 | Pretend | Literal | NA | Joke |
| | Set 1 | Set 2 | Set 3 | Set 4 |
| 5 | Joke | NA | Literal | Pretend |
| | Set 4 | Set 3 | Set 2 | Set 1 |
| 6 | NA | Pretend | Joke | Literal |
| | Set 4 | Set 3 | Set 2 | Set 1 |
| 7 | Literal | Joke | Pretend | NA |
| | Set 4 | Set 3 | Set 2 | Set 1 |
| 8 | Pretend | Literal | NA | Joke |
| | Set 4 | Set 3 | Set 2 | Set 1 |

NA = Not Applicable; Literal page included for another study