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REPLY

Concepts and Theories, Methods and Reasons: Why Do the Children (Pretend) Play? Reply to Weisberg, Hirsh-Pasek, and Golinkoff (2013); Bergen (2013); and Walker and Gopnik (2013)

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We greatly appreciate the astute comments on Lillard et al. (2013) and the opportunity to reply. Here we point out the importance of keeping conceptual distinctions clear regarding play, pretend play, and exploration. We also discuss methodological issues with play research. We end with speculation that if pretend play did not emerge because it was naturally selected (due to helping causal reasoning or some other developmentally important skill), perhaps it emerged as a by-product of 2 other selected behaviors: play fighting and language.

Keywords: pretend play, preschool, cognitive development, social development

We appreciate the interesting commentaries and the opportunity to further the discussion in reply. First, we discuss the conceptual distinctions; second, theoretical and methodological issues; and third, the issue of why children engage in pretend play.

This Messy Concept

Concepts can be unruly beasts (Margolis & Laurence, 1999), and "play" is especially wild. Theorists add to the confusion by referring to "play" when they mean "pretend play" for children ages 3 to 5—probably because it is the signature form of play for this age. In the target article (Lillard et al., 2013), we limited our discussion as best we could to pretend play, in part because it is actually a cleaner concept than play. Indeed, contrary to the claims of Weisberg, Hirsh-Pasek, and Golinkoff (2013), we maintain that it *does* have necessary and sufficient properties. Specifically, pretend play necessarily involves (a) a pretender, (b) a reality, (c) a mental representation, (d) projecting that mental representation onto reality, and (e) awareness of these prior features (Lillard, 1993). Lillard (1994, 2002) later added intention to this list: If one is not doing the projection of the pretend representation onto reality purposefully, it would be a case of delusion rather than pretend play. In addition, pretend play is often accompanied by action, but we maintain this is a characteristic rather than a defining feature (Keil, 1989) of pretense (cf. Nichols & Stich, 2000). That is, I can pretend I am a mushroom without doing anything with my body; the essence of pretense is the mental projection of my mushroom representation onto myself. Thus pretend play does have six necessary and sufficient properties, as well as a characteristic one (Lillard, 1994, also referred to positive affect as a frequent characteristic that is not necessary to pretend play).

Unlike pretend play, play is much harder to define, leading Burghardt (2011) to a five-criterion definition in which the criteria can be satisfied in multiple ways. The similarities and differences in his definition to that of Krasnor and Pepler (1980) are helpful (see also the test of Krasnor and Pepler by Smith & Vollstedt, 1985) but beyond the scope of this reply.

Although they make many excellent points, both Walker and Gopnik (2013) and Weisberg et al. (2013) incorrectly named the definition we gave for play—the four criteria of Krasnor and Pepler—as a definition of pretend play. Rather, pretend play is a *subset* of play activities. Our review was mainly of pretend play, or "studies cited as claiming that pretend play helps development" (Lillard et al., 2013, p. 27). However, in the text, sometimes on purpose (because the studies are not always clear) and sometimes to be terse, we occasionally used "play" instead. Furthermore, some studies, as we noted, did not make clear whether pretend play

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or play was at issue (but they are cited as showing pretend play helps).

It is important to draw distinctions between the constructs of pretend play, exploratory play, and exploration. Neither exploration nor exploratory play is our main focus, but because Sylva's problem-solving study (Sylva, 1974, 1977; Sylva, Bruner, & Genova, 1976) is cited in favor of (and indeed was aimed at) pretend play (especially in her 1977 discussion), we ventured into problem-solving research and elaborate here. Walker and Gopnik referred to the music box studies of Gopnik, Schultz, and their colleagues (Bonawitz et al., 2011; Schulz & Bonawitz, 2007; Schulz, Gopnik, & Glymour, 2007) as involving "exploratory play," but in our section on problem solving we suggested the studies might actually only concern exploration. The difference between exploration and play has been referred to as being between an orientation of "What does this object do?" and "What can I do with this object?" (Hutt, Tyler, Hutt, & Christopherson, 1989)—or between more closed-ended versus open-ended approaches. Given the child's goal of figuring out how the music box made music previously, the approach strikes us as being closed-ended and thus as exploration: figuring out how to get the object into a particular state (playing music).

In his classic volume, Berlyne (1960) defined three types of exploration: orienting, locomotor, and investigatory. The behaviors of children in the music box studies best fit his definition of "investigative exploration," where the function is to wrest further stimulation (music) from an object (p. 136). Exploration and play are also distinguished in the literature for having very different antecedent conditions (novelty vs. familiarity, respectively) and biological markers, with heart rate variability (HRV) highest in pretend play, suppressed in exploration, and even more suppressed in problem solving (Hughes & Hutt, 1979). The music box is novel, and the child has a goal. Obtaining HRV measures during the music box studies could provide another data point as to whether children are also "playing" as they explore these new objects, or whether they are attempting to solve a particular problem.

In a sense what we are saying is merely definitional, but the issue is key to the debate on whether play (vs. exploration) helps causal reasoning. We argued that the music box studies show that exploration helps children figure out what causes what, but that no research to date shows that play does so. At issue is where one draws the line between exploration and exploratory play. We would not call it play when an adult tries to recreate a particular result previously achieved on his or her computer, so what is different about the child trying to figure out how to make the music box play music again? This seems to us an important issue for resolution.

Although Weisberg et al. (2013) made many insightful points that we greatly appreciate, we found that they repeatedly confounded play, pretend play, and playful learning. First, they claimed Piaget had a positive estimate of *play*, when we noted (in footnote 4) that Piaget does *not* claim that *pretend play* helps development. Furthermore, in three places we explicitly stated that child-centered approaches termed *playful learning* (Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009) are well-supported. What is not supported are definitive claims that *pretend play* (which is sometimes but not always part of playful learning, as the latter "can contain a certain element of make-believe," Hirsh-Pasek et al., 2009, p. 26) helps development. Although we did not find reliable evidence that pretend play helps development (in any domain), we asserted that for some domains the evidence is open to that possibility, whereas in others the evidence is more aligned with its being an epiphenomenon.

How Can We Study Pretend Play?

One thing we all agree on is that more and better evidence is needed, as are the funds to gather it. What kind of research will generate that evidence? We argued for multimethod approaches including field and laboratory studies. Large-scale longitudinal studies should include a large number of children in order to be able to capture sufficient variability, have adequate power, and use complex analytical techniques like structural equation modeling to answer research questions. These studies should examine children's play in naturalistic settings and code for a variety of different aspects of play, with the goal of teasing apart which aspects might explain variance in children's outcomes. With this method, researchers will be able to measure and control for a comprehensive list of related variables to answer Weisberg et al.'s (2013) question: "How much of the variance in child outcomes is attributable to play, above and beyond other factors?" (p. 37). It will be important to consider how the models are specified. That is, should pretend play be a *latent variable* (from which observed features emerge) or an *emergent variable* (in which the measured indicators, like substituting one object for another, lead to the unobserved construct)? Although Weisberg et al. seemed to imply the former, the latter could be more appropriate.

As these authors aptly suggested, and we discussed in our Implications for Educational Settings section, variables that typically accompany pretend play (intrinsic motivation, active learning, and high levels of engagement), rather than pretend play itself, might do the work of improving children's outcomes. Large longitudinal studies could be informative: We might find better outcomes associated with any activities in which a child is intrinsically motivated, actively learning, and highly engaged, including but not limited to play. Pretend play could be just one of several activities that support these states. This knowledge could help us design educational curricula, toys, and media that, as much as possible, incorporate the aspects and behaviors that we find to be related to more positive outcomes.

We also argue for better designed and executed intervention studies intended to increase pretend play in children and then measure various outcomes. Such studies should heed the warnings laid out in the review of the various methodological problems that have plagued past studies, as well as our recommendations for best practices moving forward: masked experimenters, random assignment, well-controlled methods, and honest and appropriate analytical techniques (see Lillard et al., 2013). As Walker and Gopnik (2013) pointed out, theories of why play might relate to positive outcomes within a particular domain should be specified, as we did in the beginning of each section of our review. But fresh theories are needed: Researchers should, domain by domain, carefully consider by what mechanism pretend play might lead to improvements. It is important to consider the variety of types of pretend play in which children engage, as certain mechanisms might be more applicable to some types of play than others. For example, if simulating another's mind is the key behavior for developing one's

theory of mind (Harris, 1995), then we would expect role enactment to elicit greater benefits than object-substitution play. The result of this approach may be that we find a single component of pretend play that seems to drive effects in all domains, or there may be different mechanisms at work in each. Research with other populations, including children with autism (Lerner, Mikami, & Levine, 2011) and children from different cultures (Roopnarine, 2011), can also help to shed light on how pretend play might help development.

Beyond this domain-specific approach is Walker and Gopnik's (2013) call for a domain-general one. Their initial proposal was that pretend play provides children with the opportunity to practice counterfactual reasoning, which is important for many of the domains reviewed. They reported a recent study (Buchsbaum, Bridgers, Weisberg, & Gopnik, 2012) as showing that children's performance on counterfactual reasoning questions was significantly correlated with their engagement in causally coherent pretense. However, they reported in the article that "there was no difference in the counterfactual performance of children who demonstrated extended or elaborated pretense or simpler pretense" (p. 2207). If pretend play exists in order to facilitate counterfactual reasoning, then it seems that children who were more engaged in pretense in the episode should have shown better counterfactual reasoning than children who were less engaged. Although children's responses (verbal and behavioral) to counterfactual questions inside and outside of pretense were correlated, perhaps this finding only reiterates what other research also shows: that children can transfer information between pretend and real worlds (Hopkins, Dore, & Lillard, 2013; Lillard, 1994; Sutherland & Friedman, 2012).

Another interesting approach to the issue of whether pretend play promotes causal reasoning will be to gather instances of such reasoning in natural pretend play settings. Taking the Bayesian approach, children should try variations in their pretend play scenarios and observe outcomes. Children definitely reenact the same scenarios repeatedly in their pretend play; the causal reasoning hypothesis would predict that they would make small variations in the scripts to explore different possible outcomes.

In addition, if it is the case that practicing counterfactual reasoning is an important part of children's understanding of causality, then it may follow that pretense episodes can be categorized or evaluated based on the amount of counterfactual reasoning that occurs in each one, and counterfactual reasoning skills should advance accordingly. For example, a child playing with a set of dolls is likely to develop a series of counterfactuals about the various story lines in which the dolls are involved, but this kind of pretend play does not require that the child also develop false premises about the objects being used for play. The child can simply think of the dolls as dolls, if she wants, without disrupting her ability to think of the various possible story lines. However, an additional layer of counterfactual reasoning may be necessary if the child chooses to pretend that several sticks found in the backyard are actually cooking utensils and then begins pretending to be a chef. Under these circumstances, the child is no longer simply developing counterfactual story lines, but she must also set false premises about the objects themselves (they are no longer sticks; rather, they are ladles, knives, and tongs).

Similarly, this theory raises the question of whether certain kinds of reasoning are more important than others. It is unclear whether children's ability to develop counterfactual story lines is more or less important to their understanding of causality than their ability to think of one object as standing in for another (e.g., using a stick as a ladle). Future research should explore whether these various types of counterfactuals contribute in different ways to children's development.

Why Pretend?

A third issue touched on by these commentaries is why children pretend at all. Bergen (2013) argued that no purpose is necessary: Pretend play should be valued in and of itself. This might be true, but as scientists we seek to understand cause and effect, and furthermore, the debate about pretend play is key to preschool curriculum decisions. We hear of parents who choose preschools based solely on prevalence of pretend play (with some preferring high and others low!). Understanding whether pretend play has a role, regardless of whether it should also be valued for its own sake, is important.

Whereas Walker and Gopnik (2013) argued for a role in counterfactual reasoning abilities that in turn undergirds other abilities, and Weisberg et al. (2013) claimed that pretend play has a direct and wide-ranging positive influence on many aspects of development, we think pretend play might exist simply because it is an outgrowth of other mammalian and human developments that served other purposes. Play fighting, for example has been empirically shown to be important to social and sexual behaviors in animals (Pellis & Pellis, 2009; Suomi, 2011). In play fighting, organisms have to learn to read others' signals, and this skill is also used in pretend play (Lillard et al., 2007; Lillard & Witherington, 2004). The ability to read pretend behaviors as referring to their "real" counterparts is crucial to pretending. A second crucial component, which could actually arise from this first one, is being able to see one object as representing another. Symbolic ability also undergirds language, as has been noted by many including Piaget. Lillard proposes that pretend play emerges from these other abilities, not because pretend play serves any function in and of itself, but because those other abilities (play fighting and language) serve important functions, with pretend play a natural by-product.

This contention does not mean that pretend play definitively has no important function in children's development. Further research of a higher quality is needed before we can answer that question with more certainty. The existing research suggests to us that in some domains it might and in others it almost certainly does not. Another decade of high-quality research might shed much better light on the issue.

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