April 2012

28. Wandrey, L., Quas, J.A., & Lyon, T.D. (in press). Does valence matter? Effects of negativity on children's early understanding of truths and lies. Journal of Experimental Child Psychology.

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Does Valence Matter? Effects of Negativity on Children's Early Understanding of Truths and Lies

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In press, *Journal of Experimental Child Psychology*

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Abstract

Early deceptive behavior often involves acts of wrongdoings on the part of children. As a result, it has often been assumed, though not tested directly, that children are better at identifying lies about wrongdoing than lies about other activities. We tested this assumption in two studies. In Study 1, 67 3- to 5-year-olds viewed vignettes in which a character truthfully or falsely claimed to have committed a good or bad act. Children were biased to label claims that the character had committed a good act as the truth and claims that the character had committed a bad act as lies. In Study 2, 51 4- to 6-year-olds viewed vignettes in which characters either admitted or denied committing a good or bad act. Children were better at identifying truth-tellers and liars when the acts were good. Results suggest that young children initially overgeneralize the concept of lie to include all negative acts and the concept of the truth to include all good acts and only gradually make a distinction between act valence and honesty. As a result, including wrongdoing in scenarios to test children's early understanding of the meaning of lying is likely to underestimate children's abilities.

Keywords: Moral development, cognitive development, competency examination

Does Valence Matter? Effects of Negativity on Children's Early Understanding of Truths and Lies

Scientific and practical interest in children's understanding of the truth and lies has burgeoned in the past few decades. Scientific interest was initially sparked by the writings of Piaget (1932/1965), who described children's understanding of truthful statements and lies as being initially based entirely on factuality and gradually taking into account intentionality. For several decades, psychologists tested Piaget's assumptions and refined his estimates of the developmental time course of children's emerging understanding of truth and lies (Bussey, 1992; Peterson, Peterson, & Seeto, 1983; Strichartz & Burton, 1990; Wimmer, Gruber, & Perner, 1984). At the same time, practical interest was growing in a different context--concerns were being raised about children's competency in legal settings within which children are often required to demonstrate an understanding of the truth and lies in order to qualify as testimonially competent (Lyon, 2011). Researchers began to ask how best to assess children's understanding of the truth and lies in legally relevant manners (Haugaard, Reppucci, Laird, & Nauful, 1991; Lyon & Saywitz, 1999, Lyon, Carrick, & Quas, in press; Lyon, Saywitz, Kaplan, & Dorado, 2001).

Although these two lines of research have yielded considerable insight into children's emerging understanding not only of the truth and lies, but of a broad range of related concepts, including inaccuracy, mistakes, jokes, and pretense (Hummer, Wimer, & Antes, 1993; Koenig, Clement, & Harris, 2004; Siegel & Peterson, 1996, 1998; Sullivan, Winner, & Hopfield, 1995; Taylor, Lussier, & Maring, 2003), a basic question about children's conception of truthfulness and lying has gone unanswered. Specifically, what role, if any, does the valence of the events about which children are questioned play in children's early understanding?

Some research has suggested that children might be especially proficient at identifying statements as lies if they are in the context of wrongdoing. Naturalistic research, for instance, indicates that children's earliest lies concern wrongdoings--specifically denials of transgressions (Newton et al., 2000; Wilson, Smith, & Ross, 2003). Indeed, Bussey (1999) has argued that children should be particularly adept at identifying lies about transgressions because they tend to be quite familiar with denials of wrongdoing, and also because parents tend not to reprimand children for other types of falsehoods. She found some evidence to support this proposition. Four-year-olds were more likely to label transgression denials as lies than white or prosocial and trick lies. Similar arguments have been made in legal contexts, namely that truth-lie competency questions should focus on lies about wrongdoing because this will be more meaningful for children (Home Office, 2001; Hoyano & Keenan, 2007; McCarron, Ridgway, & Williams, 2004).

On the other hand, the presence of wrongdoing may interfere with children's earliest ability to identify true and false statements as the truth and lies. Young children overextend the word "lie" to include bad words (Peterson, Peterson, & Seeto, 1983; Piaget, 1932). Children sometimes appear to understand the negative connotations of "lie" better than its denotation. Wimmer et al. (1985), for example, found that children were more likely to label mistakes as immoral if they had first been asked to label them as "truth" or "lie." Maltreated children have been found to understand that lies are bad earlier than they understand that lies are false (Lyon,

Carrick, & Quas, 2010; Lyon & Dorado, 2008; Lyon & Saywitz, 1999), although this tendency has not been found among non-maltreated children (Lyon, Carrick, & Quas, in press). Finally, Bussey (1992) found that, although 4-5-year-old rated lies slightly more negatively (on a "badness" scale) than telling the truth about a wrongdoing, this same age group rated truthful statements about a wrongdoing and the wrongdoing itself as comparably bad. It was not until age 7 that the children rated truthful statements about the wrongdoing less negatively. If children initially associate badness with lying, then situations in which badness, which could include a wrongdoing or discussion of a wrongdoing, may bias children toward labeling those situations or statements as lies.

Bussey's (1999) finding that children were proficient at identifying denials of transgressions as lies is not inconsistent with the possibility that children's association of lying with negativity will sometimes impair their apparent understanding. Four-year-olds' difficulty in correctly labeling prosocial lies as such may have stemmed from their tendency to label only negative statements as lies. Because the prosocial lies did not explicitly reference a negative act, they were not considered lies. Moreover, whereas only about 10% of the 4-year-olds mislabeled false statements of wrongdoing as the truth, 25% mislabeled true admissions of wrongdoing as lies. As a final note, because Bussey's (1999) youngest subjects were 4 years of age, the effects of valence on children's earliest understanding could not be determined. Recent research indicates that, when assessing the truthfulness of neutral statements (without any transgression involved), children are capable of differentiating truth from lie by 3 ½ years of age (Lyon, Carrick, & Quas, in press). Thus, the inclusion of a wrongdoing may well bias children in a manner that leads to heightened accuracy when lying about that wrongdoing, but reduced accuracy when telling the truth about it.

The purpose of the current research was to assess this possibility by examining directly the effect of valence of events on children's ability to label true and false statements as the truth or lies. We presented children scenarios in which we systematically varied the valence of acts committed and statements made about those acts. We predicted that children's judgments would be influenced by valence; that is, that they would exhibit a bias toward labeling statements as lies when those statements referenced bad acts, and toward labeling statements as truth when those statements referenced good acts.

Study 1

In Study 1, 3- to 5-year-olds' understanding of truth and lies about wrongdoings and positive acts was investigated. Children were exposed to vignettes that varied (1) the valence of an original act (wrongdoing v. positive act); and (2) whether the character told the truth about the act or lied, with the lies further varying in whether they were same or opposite valence as the original act. Children were then asked whether the character told the truth or lied. The study conformed to a 3 (Age) X 6 (Condition) X 2 (Question type) design. In two conditions the character told the truth (one about a wrongdoing, one about a positive act); and in four conditions the character lied. For two of the lies, the false statement matched the valence of the act committed (e.g., the character committed a wrongdoing and then lied by claiming another wrongdoing), and for the other two lies, the false statements were opposite in valence to the act committed (e.g., the character committed a wrongdoing and then lied by claiming to have

committed a positive act). The question type factor referred to whether the child was asked if the character told the truth or lied. Age was varied between subjects, and act valence, statement type, and question type varied within subjects.

We expected developmental improvements to emerge in children's performance, consistent with prior work (Lyon & Saywitz, 1999; Strichartz & Burton, 1990). Also, given young children's tendency to associate the term "lie" with badness (Peterson et al., 1983; Piaget, 1932), we expected children, especially the 3- and 4-year-olds, to label any mention of wrongdoing as a lie, regardless of whether the character was telling the truth. Finally, we predicted that younger children would be more accurate overall when asked about the truth rather than a lie, as reported in previous research (Lyon et al., 2010).

Method

Participants. Sixty-seven (38 female) 3- to 5-year-olds served as participants: 20 3-year-olds (M = 3.62; SD = .23), 21 4-year-olds (M = 4.60; SD = .27) and 26 5-year-olds (M = 5.49; SD = .31). Gender was distributed approximately evenly across age. Children were recruited from preschools in Orange County, California. The ethnic composition of the sample was 49.3% Caucasian, 7.5% Hispanic, 22.4% Asian, 4.5% African American, and 16.3% mixed/other.

Materials and procedure. All procedures took place at children's preschools following written parental consent and child assent. An interviewer administered the study task to each child individually via computer while an assistant transcribed children's answers. The task consisted of 6 conditions; each condition contained 4 vignettes. The picture showed a character committing either a good act (e.g., giving a toy) or a bad act (e.g., hitting) and the character claiming to have committed either a good act or a bad act (with a talk bubble depicting the character's words). In two conditions, the character told the truth, and in four conditions, the character lied, as described below. The interviewer narrated the vignette, and then asked "Did [the boy] tell the truth" or "Did [the boy] tell a lie?" in alternating order. Half of the children were first asked if the character had lied, and half were first asked whether the character had told the truth. The order of the conditions' presentation was counterbalanced within age using a Latin square design. At the end of the task, children were given a small prize for their participation.

In three of six conditions, associating truth-telling with claims of badness and lying with claims of goodness (regardless of the valence of the act committed) should lead children to poor performance: In condition A, the character committed a bad act and told the truth about that bad act. In condition B, the character committed a bad act and falsely claimed to have committed a *good* act. In condition C, the character committed a good act and falsely claimed to have committed a *different* good act. In the other three conditions, associating truth-telling with claims of goodness and lying with claims of badness (again, regardless of the valence of the act committed) should lead to enhanced performance: In condition D, the character committed a good act and told the truth about that good act. In condition E, the character committed a good act and falsely claimed to have committed a *bad* act. In condition F, the character committed a bad act and falsely claimed to have committed a *different* bad act.

Together, the conditions enabled us to test the following: If the predicted bias was present, and if the character stated that he committed a bad act, children would call the character a liar. This would impair performance on task A (telling the truth about a bad act) but inflate performance on tasks E and F (lies that claimed a bad act). If the character stated that he committed a good act, children would call the character a truth-teller. This would impair performance on tasks B and C (lies that claimed a good act), but inflate performance on task D (telling the truth about a good act).

Results

Children's responses were scored as correct if they accurately identified whether the characters told the truth or a lie. "Don't know" responses ($N = 3$) were considered incorrect. Correct responses were summed and divided by the number of questions asked to create percentage accuracies for each condition. Preliminary analyses showed that order, gender and ethnicity were unrelated to children's performance. None are considered further.

We entered children's accuracy scores into a mixed model 3 (Age: 3, 4, and 5) X 6 Condition (A, B, C, D, E, and F) X 2 Question Type (truth v. lie) ANOVA, with condition and question type varying within subjects The main effect of age was significant, F (2, 64) = 9.161 $p<.001$ $\eta_p^2 = .22$: The 5-year-olds, $M = .69$ ($SD = .22$), performed significantly better than the 3-year-olds, $M = .49$ ($SD = .06$), $p < .001$, and the 4-year-olds, $M = .54$ ($SD = .16$), $p = .01$; 4-year-olds did not significantly differ from 3-year-olds. The main effect of condition was also significant, F (5, 60) = 3.05, $p = .016$, $\eta_p^2 = .20$, as was the condition X question type interaction, F (5, 60) = 3.50, $p = .008$, $\eta_p^2 = .23$.

Review of children's general performance across the conditions suggested that the condition effect was attributable to children's relatively poor performance on the A, B, and C tasks, suggesting that claims of badness and goodness were interfering with children's understanding of the truth and lies. Whereas children's performance did not exceed chance on the A, B, and C tasks, they did perform above chance on the D, E, and F tasks (Figure 1). Finally, we examined the significant condition X question type interaction via a series of paired samples t tests comparing truth v. lie questions within each condition. Only Condition D, in which the character told the truth about a good act, significantly differed by question type, t (66) = 2.99, $p = .004$; children performed better when asked whether the character told the truth, $M = .80$ ($SD = .33$), than whether the character told a lie, $M = .58$ ($SD = .46$).

In a separate set of analyses, we examined more subtle age-related changes in children's understanding by comparing each age group's performance to chance (i.e., 50%) across the conditions. Whereas the 5-year-olds performed significantly above chance on all of the conditions, ts (25) ≥ 2.54, ps $\leq .018$, with the exception of Condition C (which corresponded to the quite uncommon situation in which a character committed a good act and then lied by claiming to have committed another good act), the 4-year-olds only performed significantly above chance on Condition D (in which the character told the truth about a good act), t (20) = 3.35, $p = .003$, and the 3-year-olds failed to do so on any of the conditions. Indeed, the 3-year-olds were significantly below chance on the A stories, t (19) = -2.18, $p = .042$, in which the

character honestly disclosed committing a bad act. In other words, the 3-year-olds showed a strong tendency to label honest disclosures of wrongdoing as lies.

Discussion

Study 1 revealed that young children were influenced by the goodness or badness of the reported act when determining if characters had told the truth or lied. If a character claimed to have committed a good act, children were more inclined to call his statement the truth. If a character claimed to have committed a bad act, children were more inclined to call his statement a lie. As a result, children appeared either more or less competent at identifying the truth and lies depending on the valence of the story. Children exhibited heightened accuracy when assessing truth-telling about good acts and lies about wrongdoing, but reduced accuracy when assessing truth-telling about wrongdoing and lies about good acts. Our results are consistent with research indicating that children initially associate lying with "bad words" (Peterson, et al., 1983; Piaget, 1932/1965) and concurrently argue against an alternative bias, that children attended to the valence of the *act*, and called good acts the truth and bad acts lies. If the latter bias were operating, children should have performed better on the B task (lie about a bad act) and poorly on the E task (lie about a good act), which did not occur.

The results, though, also raised several issues. First, wrongdoing bias might not affect children's understanding of the truth and lies that involve simple admissions or denials. That is, the characters in Study 1 always explicitly claimed to have committed an act. Children in turn focused on the claimed act in deciding whether the statements were the truth or lies. In contrast, a simple admission or denial might not focus children's attention on the content of the character's statement, therefore making it easier for children to assess the congruence or incongruence between the statement and true state of affairs, thus facilitating correct identification of truth-telling and lies.

However, focusing children's attention on the character's actual actions (rather than statements) raises the potential for another type of wrongdoing bias to operate. As already mentioned, if children associate lying not just with bad words but with badness in general, then they may be predisposed to call any character a liar who commits a bad act and any character a truth-teller who commits a good act. Presenting children with scenarios in which the characters utter simple affirmations and denials about good and bad acts can test for this possibility.

Examining simple affirmations and denials is worthwhile for a second reason as well. Children's early lies tend to be simple denials (Newton et al., 2000; Wilson, Smith, & Ross, 2003). Children may thus be especially proficient in identifying lies of this type. Third, the nature of the tasks in Study 1 may have underestimated children's understanding. The tasks necessarily included information about the valence of both the character's action and the character's statement about his or her action, potentially leading to some complication. Moreover, children may not have fully understood that the character's claims were responsive to questions about the character's actions; that is, when endorsing truth-telling, children may have believed that the character committed two acts: both the depicted act and the act the character claimed to have performed. Presenting scenarios in which characters simply affirmed or denied committing acts avoids this type of confusion. Fourth and related, we did not ask control

questions to confirm children's understanding of the vignettes. Perhaps the younger children's performance was influenced by confusion regarding the scenarios. However, the fact that children did show systematic patterns of responding to some of the vignettes suggests they had some comprehension. Fifth, some of the scenarios may have seemed anomalous to children (for example, why would a character lie about committing a good act?), which again could have influenced their responses to some vignettes

Finally, children performed better when asked if the character told the truth than if the character told the lie in one of the conditions, consistent with prior research (e.g., Lyon et al., 2010). This has been interpreted as a possible reluctance on children's part to apply the term lie to statements, consistent with a positivity bias among children that reduces their willingness to label negative acts or images as such (e.g., Carrick, Quas, & Lyon, 2010; Lyon et al., 2011). Because such a bias may have further underestimated children's understanding of "lie," in Study 2 we presented children stories in which they chose which of two characters lied or told the truth, a forced choice procedure that should help overcome any reluctance to label characters as liars.

Study 2

In Study 2, 4- to 6-year-olds were presented with vignettes in which two characters committed either a good or a bad act, and one character admitted performing the act whereas the other character denied doing so. Children were then asked which character had told the truth or which character had lied. The study conformed to a 2 (Age) X 2 (Condition) X 2 (Question type) mixed model design.

We again expected developmental improvements in performance (Lyon & Saywitz, 1999; Strichartz & Burton, 1990) and that children would be more accurate when asked which character told the truth than which character lied (Lyon et al., 2010). Also, we anticipated that children, especially the younger children, would be more accurate when asked about good acts than when asked about bad acts. Because of 3-year-olds' generally poor performance in Study 1, our youngest subjects were 4 years old.

Method

Participants. Fifty-one 4- to 6-year-olds (30 female), none of whom was included in Study 1, served as participants. Using a median age split, children were divided into two groups: 26 4 ½- to 5 ½-year-olds (M = 4.58, SD = .50) and 25 5½- to 6-year-olds (M = 5.68, SD = .48). Gender was distributed equally within age. Children were recruited from preschools or after-school programs. Their ethnicity varied: 28.0% Caucasian, 4.0% Hispanic, 46.0% Asian, and 22.0% mixed/other.

Materials and procedure. Study 2 followed the same testing procedure as Study 1: Parents provided written consent, children were tested individually in their schools, and children provided verbal assent. The study stimuli included 16 vignettes, each containing 2 pictures, presented via computer. In the first picture of each vignette, two characters were shown doing either the same good act (e.g., feeding) or the same bad act (e.g., kicking) a recipient. In the second picture, one character admitted and the other character denied committing the act. The

interviewer narrated what occurred while children viewed the picture. Thus, for example, the interviewer said, "These boys are good. These boys each gave a ball to their brother." Next, she said, "Their Mother says, 'Did you give a ball to your brother?'" She showed the second picture and said, "This boy says, 'No, I did not give a ball to my brother.' This boy says, 'Yes, I gave a ball to my brother.' Which boy told the truth?" or "which boy told a lie?" in alternating order. The vignettes systematically varied the recipients (dog, cat, little sister or brother), the valence of the act, and the question asked, with order of presentation counterbalanced.

Results

Children's responses were scored as correct or incorrect (there were no "Don't know" responses). Percentage correct scores were created for each condition. Preliminary analyses revealed no significant ethnic differences in performance. However, gender differences emerged. Boys outperformed girls, $M = .88$ v. $M = .70$, $F\ (1, 47) = 5.17$, $p = .028$, and gender was included in the main analyses.

Children's proportion scores were entered into a 2 (Age) X 2 (Gender) X 2 (Act Valence: good act v. bad act) X 2 (Question Type: truth v. lie) mixed model ANOVA. Significant main effects of Age, $F\ (1, 47) = 16.54$, $p < .001$, $\eta_p^2 = .26$, and Act Valence, $F\ (1, 47) = 8.92$, $p = .004$, $\eta_p^2 = .16$, emerged. Older children, $M = .86$ ($SD = .19$), performed significantly better than younger children, $M = .65$ ($SD = .19$). Children were more accurate when the committed act was good, $M = .85$ ($SD = .21$), rather than bad, $M = .65$ ($SD = .37$) (See Figure 2).

Significant Gender X Act Valence, $F\ (1, 47) = 4.14$, $p = .048$, $\eta_p^2 = .08$, and Age X Question Type, $F\ (1, 47) = 5.73$, $p = .021$, $\eta_p^2 = .11$, interactions also emerged. The Gender X Act Valence interaction revealed that boys ($M = .79$, $SD = .32$) outperformed girls ($M = .56$, $SD = .39$) on the bad acts, but that the two genders performed equally well on the good acts (Boys $M = .84$, $SD = .24$; Girls $M = .86$, $SD = .19$). The Age X Question Type interaction reflected that fact that, whereas the younger children performed somewhat better when asked which character told the truth, $M = .69$ ($SD = .21$), than which character lied, $M = .60$ ($SD = .26$), $t\ (25) = 1.84$, $p = .08$, the older children did not differ, Ms = .84 ($SD = .23$) and .89 ($SD = .18$) for questions about the truth and lie, respectively.

Discussion

Study 2 again sought to understand how the valence of acts about which the truth or a lie is told affects children's early understanding of the truth and lies. We modified procedures employed in Study 1 to reduce ambiguities and evaluate simple admissions and lies of denials rather than lies involving false claims. The prediction that valence mattered was supported. Children were better at identifying both the truth and lies when the characters committed good acts rather than bad acts. The difference in performance between questions about the truth and questions about lies, noted in Study 1, did not reappear in Study 2, although the younger children exhibited a marginal tendency toward that direction. The move to forced-choice questions, which made it clear that one of the characters did in fact lie, may have overcome children's resistance to call a character a liar. Unexpectedly, boys performed better than girls, at least with

respect to the bad acts. Because we are unaware of any previous research finding gender differences in understanding of truth and lies, we do not attempt to interpret this finding.

General Discussion

Understanding the difference between the truth and lies is a significant milestone in children's moral and cognitive development. It is related to their moral evaluations, concepts of right and wrong, and interpretations of their and others' behavior, and a great deal of theorizing and empirical attention has been devoted to documenting the developmental timecourse of this milestone's occurrence (Piaget, 1932/2965; Strichartz & Burton, 1990; Wimmer, Gruber, & Perner, 1984). Legally, whether children can differentiate the truth and a lie has implications, formally and informally, about their perceived competency, credibility, and ability to provide accurate testimony. Finally, parents and other adults regularly relay to children the importance of telling the truth about events that they have experienced. That young children's performance is significantly affected by the valence of the acts and statements involved has critical implications for how best to evaluate children's early understanding and determine at what age and how children come to understand the difference between the truth and a lie.

We found, in two separate investigations, that wrongdoing can impair children's understanding of the truth and lies. In Study 1, young children were affected by the valence of the claims that speakers made about their actions; if a speaker claimed to have committed good acts, then children were biased to call the statement the truth, and if a speaker claimed to have committed bad acts, children were biased to call the statement a lie. In Study 2, when we removed the valence of the claims, the valence of the actions themselves then mattered; if speakers committed good acts, then children were capable of distinguishing between truth and lies, but if speakers committed bad acts, then children had difficulty doing so. In other words, when the explicit claims about good and bad acts were removed, children still sought to find something negative with which to equate lies.

Overall, the results suggest that the valence of statements and actions interfere with children's initial understanding that the truth refers to factual statements about actions and that lies refer to untruthful statements about actions, independent of the rightness or wrongness of the actions themselves. The results are consistent with research finding that children overgeneralize the concept of lies to include bad words (Peterson et al., 1983; Piaget 1932/1965); our findings suggest that those bad words include wrongdoing and claims of wrongdoing. The results are similarly consistent with research in cognitive and linguistic development demonstrating that children often initially apply concepts broadly and only gradually acquire adult-like understanding (Flavell, Miller, & Miller, 1993).

The findings have important implications for children's early understanding of the truth and lie, particularly in relation to how best to ask about that early understanding. In legal contexts, child witnesses must often demonstrate an understanding of truth and lies in order to qualify as competent. Some have recommended that competency questions about truth and lies should involve scenarios in which a character commits a wrongdoing (Home Office, 2001; Hoyano & Keenan, 2007; McCarron, Ridgway, & Williams, 2004). Our results cast doubt on these recommendations, insofar as they may lead to underestimation of children's understanding.

That is, children do not appear to understand lies in the context of wrongdoing better than in other contexts. Instead, because of the strong moral connotations of both lying and wrongdoing, introducing wrongdoing into scenarios designed to test young children's understanding of the truth and lies potentially interferes with children's judgment. Indeed, research demonstrating understanding of truth and lies at younger ages than previous research has utilized stimuli in which characters utter true and false labels, rather than make true and false statements about misbehavior (Lyon et al., 2011). It is only once biases associated with valence are removed that children's earliest understanding can be clearly detected.

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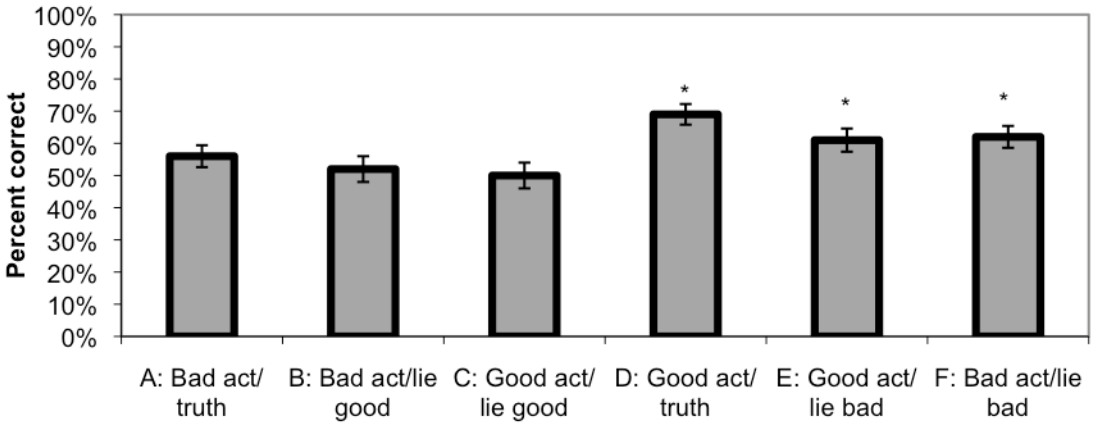
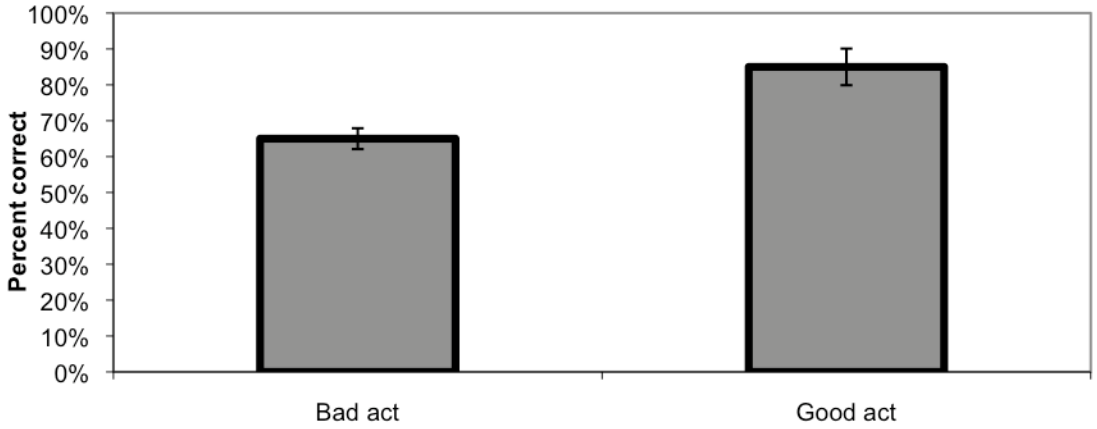
Figure 1. *Study 1 percent correct by condition*



Note. Error bars reflect confidence intervals. Asterisks reflect above chance performance at $p < .05$.

Figure 2. *Study 2 percent correct by condition*



Note. Error bars reflect confidence intervals.