



When pictures lie: Children's misunderstanding of photographs



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ABSTRACT

In three experiments we examined duality of representation for photographs in young children. Three- to four-year-olds were shown a target item which was then hidden. A sticker was placed on a photograph of this target and children, asked to retrieve the referent, were faced with a choice between a stickered and un-stickered version. Children brought back a stickered distracter object, as if the action to the photograph had modified the object. Control conditions demonstrated that these errors could not be attributed to memory failure or bias towards stickered objects. Experiment 2 indicated that children's errors depended on the sticker being placed directly on the image on the photograph and were not due to signalling which object to choose. A final experiment demonstrated that this effect could be observed under circumstances involving more substantial changes to objects: Here, children acted as if wetting a photograph of an object would cause the object itself to become wet. We interpret these results as evidence that an immature comprehension of photographs fails to take into account the episodic and symbolic referential nature of photographs.

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1. Introduction

In his famous picture, "The Treachery of Images," Belgian surrealist Magritte painted a pipe with the caption, "Ceci n'est pas une pipe," ("This is not a pipe") to explicitly draw the audience's attention to the duality of representation. The concept of duality, here, refers to the fact that images not only refer to other objects in the world but are also three-dimensional objects in their own right (e.g. Deloache, 1987, 2004; Perner, 1991; Robinson, Nye, & Thomas, 1994). Jolley (2008, 2010) has outlined the key components of a mature understanding of this dual nature of pictures, highlighting the fact that this involves *simultaneous* comprehension of the representation's status as an independent object, as well as its referential links with another generic or specific entity.

What is the developmental progression for understanding duality of representation? Numerous accounts suggest that when an object and a representation of the object diverge in appearance as circumstances concerning both items change, children have difficulty reconciling the relationship between the two (for a review, see Jolley, 2010). For example, in Zaitchik's classic "false photo" experiment (1990) a photograph was taken of an object in location A – on a chair – before moving it to location B – a bathtub. Following the move, Zaitchik asked her preschooler participants "In the picture, where is the object?" Five-year-olds consistently and correctly responded that the object was on the chair in the picture. However, three- and four-year-olds tended to report that the object was on the bathtub in the picture, as if the photograph mirrored the room. It seemed that these younger children were able to understand that photographs are inherently 'linked' to their referent objects, but failed to appreciate their independent state and separate physical attributes. This misunderstanding of pictures appears wholly at odds with the fact that children will have come into contact with a vast array of representations by this age (see Bovet & Vauclair, 2000) and demonstrate precocious ability to

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distinguish between two- and three-dimensional objects (Slater, Rose, & Morison, 1984), yet has been consistently replicated by numerous groups of researchers (Charman & Baron-Cohen, 1992; Leekam & Perner, 1991; Leslie & Thaiss, 1992; Robinson et al., 1994; Slaughter, 1998; Thomas, Jolley, Robinson, & Champion, 1999).

The question remains as to why children of this age should be making these kinds of errors under experimental conditions, yet frequently interact with images in the normal course of day-to-day life. Bright (2011) has discussed this apparent anomaly in reference to children's difficulty with reconciling concrete and representational properties of pictures in the same situation, as they are called on to do in false photograph experiments. This is a view shared by DeLoache (2004) and Jolley (2008), who have compared the difficulty that young children appear to face when switching between two interpretations of an ambiguous figure (e.g. Jastrow's duck-rabbit drawing; Jastrow, 1899) with their inability to think about both the episodic and representational properties of a photograph. This view reconciles the apparently paradoxical findings of false-photograph work with those of others (e.g. Ganea, Bloom-Pickard, & DeLoache, 2008; Preissler & Carey, 2004; Tomasello, Striano, & Rochat, 1999), who have demonstrated that even very young children are able to fully understand the representational nature of symbols such as pictures and gestures, and do not rely on symbols matching their referents precisely. In this view, the struggle that children face is not in understanding either of the two aspects of representation, but to hold both in mind simultaneously.

Nevertheless, the striking claim that children under five report that a photograph will seemingly update after seeing changes made to referent objects calls for closer inspection. Typically, children have been asked to report on the effects for a picture or photograph when the corresponding 'real' object has been changed. In a deliberate departure from this previous work, here we have employed a behavioural, rather than verbal, measure. Discrepancies between verbal and behavioural reports have been common in studies of children of this age, particularly in those involving seemingly magical transformations (Harris, Brown, Marriott, Whittal, & Harmer, 1991; Subbotsky, 2001; Woolley, 1997; Woolley & Phelps, 1994), which gives us grounds to believe that the claim that children apparently misunderstand photographs may be an artefact of the methodology employed, and possibly result from limitations such as confusion over verbal references by the experimenter in situations where the item itself or its photograph might equally be called by the same name (e.g. "Look at the dog!" which might refer to a picture of a dog, or the animal itself, cf. Perner, 1991). Here, we sought to determine whether children really will act in accordance with the verbal claims they have made in previous work – that is, whether they will interpret actions taken towards one side of the object-photograph dyad as impacting similarly on the other (e.g. Robinson et al., 1994; Zaitchik, 1990).

A second key facet of the approach taken here enabled us to determine the extent to which children's errors in this area may be due to their familiarity with 'real' objects being a more reliable source of information than an image of the same object. To date, children have been typically

asked what a photograph depicts after the referent object has been moved or changed. This does not give a full indication of their understanding of the relationship between the photograph and reality, as it fails to determine whether children think commensurate changes would occur to the real object were the photograph to be changed, rather than vice versa. There has been an assumption that the relationship is asymmetric: Perner (1991) claimed that childhood reasoning is based on the concept that reality defines truth and as such, that symbols such as photographs will hold faithfully to reality, but not vice versa. Similarly, Wellman (1990) suggests that three-year-olds believe photographs (and mental representations, like beliefs) will "faithfully depict the situation" (p. 266).

However, evidence that children may prioritise the fidelity of reality over representations comes from Robinson and colleagues' reports of children's apparent 'backdating' errors (Robinson et al., 1994). In one experiment, children watched as a picture was drawn of a doll wearing a sticker. The picture was then changed to indicate that the doll was wearing a different sticker. When the doll and picture were placed face down, children tended to report that the picture showed the doll wearing the original sticker. Here, it seems, children prioritised reality over representations to the extent that they appeared to entirely discount the changes that they had seen made to the picture in front of them. Again, children appeared to be unable to consider the representation flexibly as both an object in its own right, and a depiction of another object. It is not clear from this work, however, whether children perceive the relationship between an object and representation as wholly asymmetrical or if it is simply the case that the reality-reflecting aspect of a picture is more salient for children than the picture's separate object history under these experimental circumstances, perhaps exacerbated by the fact that the two objects were visible alongside one another. Here, we examined how children made use of information in pictures to tell them something about referent objects in the world, and explored whether the information they gleaned from these images would override their understanding of the physical nature of photographs themselves. An initial experiment employed two variations of the same basic task, in which the goal was to retrieve a target object (either a balloon, or a box) after observing actions being taken towards a photograph. Throughout these experiments, objects were hidden from view while actions were taken towards photographs. Objects were secreted in this way to prevent children being biased towards the reality-reflecting properties of the objects while making judgments about the effects of changing the photos (cf. Robinson et al., 1994). As such, these experiments represent a novel examination of the asymmetry in the referent-representation relationship.

2. Experiment 1

2.1. Method

2.1.1. Participants and design

Fifty-five 3;3 to 4;5 year olds (mean age 3;10 months) took part in this experiment, recruited from a day nursery.

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