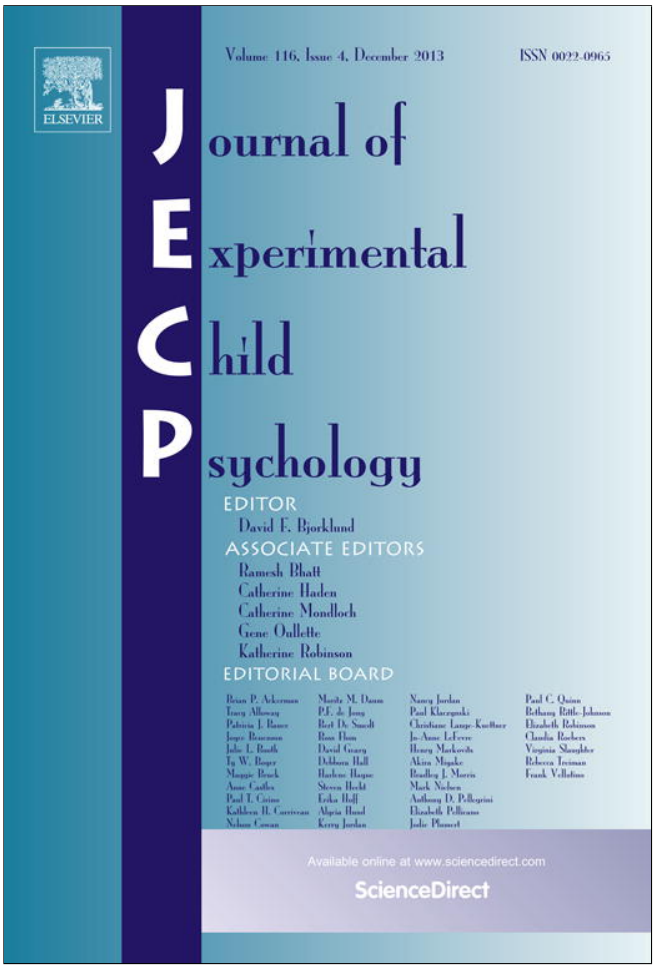

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Brief Report

Deontic reasoning as a target of selection: Reply to Astington and Dack

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ABSTRACT

In their discussion of young children's deontic reasoning performance, Astington and Dack (2013) made the following claims: (1) Children need more cues to elicit cogent social norm reasoning than adults require, namely, explicit reference to authority; (2) Deontic reasoning improves with age, and this is evidence against a nativist view; (3) All evolutionary explanations of deontic reasoning advantages require positing a "domain-specific deontic reasoning module."; and (4) young children excel at deontic reasoning because it is easier. Here, I refute each claim. Instead, I argue that (1) Social norm reasoning is one type of deontic reasoning that has been the target of selective pressure; (2) Development does not preclude nativism; (3) Epistemic utterances make no greater processing demands than deontic utterances; and (4) both adult and child norm reasoning performance is strongly influenced by reference to or implication of authority.

In their reply to Cummins (2013), Astington and Dack (2013) make four key points. I reply to each here.

(1) Children need more cues to elicit cogent social norm reasoning than adults require.

Astington and Dack base this conclusion on results of Stanovich and West (1998, Study 1), which showed that adults showed a deontic reasoning advantage (~32%) compared with hypothesis testing (~17%) even when reference to authority was removed. Yet inclusion of authority typically boosts adult deontic performance to 80% in most studies that employ the Wason Card Selection Task (e.g., Griggs & Cox, 1982; Stanovich & West, 1998, Study 2). In other words, even adult performance is

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strongly affected by the inclusion of reference to authority. This belies the assumption underlying Astington and Dack's arguments that adults need not reply on such cues in order to elicit cogent social norm reasoning strategies.

Why should direct reference to authority matter? Only authorities can create norms. This distinguishes norms from social conventions, fads, or fashion—phenomena that also elicit behavioral compliance but generally do not require authority for their creation.

(2) If deontic reasoning improves with age, this is evidence against a nativist view.

Improvement in cognitive performance with age is no more evidence against a nativist view than the fact that adults are better at walking than toddlers is evidence against a nativist view of bipedalism. Left to their own devices, infants will begin to walk as this particular biological program (which was obviously a target of selection) unfolds. This motor skill then becomes a pedagogical target; caregivers typically become involved in facilitating and shaping this behavior. Infants rapidly acquire this skill because it is "natural for them"; that is, it is easy for them to learn. In contrast, infants will *not* spontaneously begin to try playing the piano, although their caregivers may introduce this skill early on in an effort to aid its acquisition. The former is part of our biologically based developmental program, whereas the latter is a cultural invention. The former requires a careful coupling of input from the social environment within the proper biological time for it to develop, whereas the latter requires direct pedagogy.

Evidence from studies such as Cummins (1996b), Harris and Nuñez (1996), and Rakoczy, Schmidt, Tomasello, and colleagues (e.g., Rakoczy, Brosche, Warneken, & Tomasello, 2009; Rakoczy, Warneken, & Tomasello, 2008; Schmidt, Rakoczy, & Tomasello, 2011; Schmidt & Tomasello, 2012) indicates that social norm reasoning (and other types of deontic reasoning) is more like walking than it is like piano playing. Left to their own devices, infants will spontaneously attend to social cues in their environment in ways that allow rapid acquisition of social norms. They will find this kind of learning easy, but they will require proper feedback from their social environment to hone this skill. To say that this skill "develops" (as Astington and Dack take pains to argue) rather than simply being learned implies a biological component. The fact that acquisition of and adherence to social norms plays a crucial role in survival among social animals makes it a likely target of selection (Cummins, 1996a, 1996c, 2000, 2004).

(3) All evolutionary explanations of deontic reasoning advantages boil down to positing a "domain-specific deontic reasoning module."

Curiously, Astington and Dack attribute to me the positing of a "deontic reasoning module" despite the fact that the word "module" appears nowhere Cummins (1996a, 1996b, 1996c), nor does it appear in my reply to their recent article.

Astington and Dack seem to have confused my position with that of Cosmides and Tooby (Cosmides, 1989; Cosmides, Barrett, & Tooby, 2010). Although the view proposed by Cosmides and Tooby constitutes one prominent view of evolutionary explanation in psychology, not all evolutionary psychologists appeal to "hard" modules when explaining cognitive or behavioral traits. The appeal of modularity is twofold. First, the brain consists of anatomically and functionally separate lobes and processing streams that are selectively recruited for specific tasks (e.g., vision is primarily handled by the occipital lobe, syntactical and lexical aspects of language processing are handled primarily by language circuitry involving Broca's and Wernecke's areas). Neuroscientific research is replete with examples of double-dissociations that appear to map specific cognitive tasks to specific brain areas. Second, neural network simulations indicate that there exists ubiquitous direct selection pressure to reduce the cost of connections between network nodes, and this causes the emergence of modular networks (Clune, Mouret, & Lipson, 2013). The difficulty is that the infant brain, although replete with modularity, is highly plastic (e.g., aphasias do not occur in very young children who suffer brain trauma), and gene expression is now known to be under environmental influence (e.g., Canli et al., 2006). This pattern is more consistent with the view that the young brain is better described as biased toward modularity but highly dependent on environmental input.

For this reason, my colleagues and I have been at pains to explain deontic reasoning advantages through appeal to a very different route, namely, early emerging biases and canalization (Cummins & Cummins, 1999, 2003; Cummins, Cummins, & Poirier, 2003), characteristics that were shaped over evolutionary time by the exigencies of living in social groups. Numerous primatologists have argued that, as Silk (2007) noted, "Primates are endowed with cognitive abilities that are especially well suited to tracking social information. For example, primates are able to recognize individuals; identify kin; compute the value of resources and services; keep track of past interactions with group members; make transitive inferences; discriminate between cooperators and defectors; and assess the qualities of prospective rivals, mates, and allies" (p. 1348). These characteristics of primate cognition have measurable fitness consequences, that is, measurable impact on the frequency of an individual's genes in the gene pool via differential reproductive success. It is not clear why humans would be exempt from this evolutionary pressure. The fact that deontic reasoning appears subject to early emergence is consistent with the view that the demands of social living shaped the evolution of human cognition; its "footprint" can be seen in newborns' preference for looking at faces (Goren, Sarty, & Wu, 1975), the precocity with which infants interpret emotional facial expressions (Entremont & Muir, 1997), infants' desire to engage in reciprocal turn-taking games (Vandell & Wilson, 1987), and, yes, even the precocity with which they approach the acquisition and implementation of social norms.

Astington and Dack continue to take exception to my evolutionary explanation by arguing that the current data do not allow us to speak to whether or not deontic reasoning is innate. It is not clear on what basis they believe they can make this argument. The only sense I can make of their objection is that they continue to interpret the term "innate" to mean "fully developed at birth." But as I pointed out above and in my earlier reply, walking, secondary sex characteristics, and binocular visual columns all are indeed "innate" (parts of our bioprogram that require differing levels of environmental input to fully develop), yet none is "present at birth."

There also seems to be a misunderstanding of the term "canalization" in their reply where they state, "Possibly, DePrince, Chu, and Comb's (2008) findings are inconsistent with the nativist view insofar as this view would suggest that deontic reasoning is biologically robust (canalized) and not subject to environmental variation." But this is precisely wrong. I have argued just the opposite. Limb development is highly canalized (but not perfectly so, as the case of thalidomide shows). Language—and deontic reasoning—is less strongly canalized in that all humans everywhere readily acquire language and social norms (and at around the same age), whereas the type of language or norms they acquire shows great variation across cultures. Moreover, Astington and Dack go on to claim that children who suffer interpersonal trauma (i.e., physical or sexual abuse, particularly by family members) show deontic reasoning impairments compared with epistemic reasoning and that this result is inconsistent with—rather than predicted by—the learning bias and canalization view. Let me be clear: Interpersonal trauma specifically impairs deontic reasoning while sparing epistemic reasoning. This is precisely what the learning bias and canalization view predicts.

(4) The critical difference between norms and normative propositions is how the statement is interpreted.

Astington and Dack appear to take me to task for apparently not comprehending the difference between norms and normative propositions, but they indicate that there is insufficient space to discuss this issue at length. Yet their interpretation of the difference between the two is precisely the same as the difference I was at pains to explain in my reply.

Astington and Dack state that the critical difference between norms and normative propositions is in how the statement is interpreted—as a rule to be obeyed or as an assertion whose truth can be tested. They appeal to Searle's (1983) satisfaction conditions to bolster their claim. Yet this is precisely the distinction I explained at some length in my reply. It is not clear why they believe they are arguing something different.

The situation is less clear when they appeal to these same discrepancies to dismiss the argument I made against their claim that children excelled at deontic reasoning because "it is easier"—the claim they make in their original article: "The auxiliary verb system is first used for deontic reference and then for epistemic reference (Shatz & Wilcox, 1991). That is, although the same auxiliary verbs are

used in the same syntactic frames, children first use terms such as *must* and *may* to talk about obligation and permission, and only several years later do they use the same terms with reference to certainty and possibility" (Dack & Astington, 2011, p. 97). In other words, deontic auxiliaries must be easier because they emerge earlier, and they emerge earlier because they are easier.

The usual reason given in the language literature for earlier emergence and ease of processing of deontic terms is that epistemic utterances make greater metarepresentational demands because they purportedly require children to detect discrepancies between an individual's mental representation and the actual world (e.g., comparing "It must be raining" and "It is not raining"). But social norm reasoning makes the same demands; that is, one must detect discrepancies between what ought to be true (e.g., "Squeaky mice must stay in the house") and what is true (e.g., "Squeaky mice are not in the house"). Astington and Dack apparently reject this oft-given explanation, attributing differences in cognitive processing demands to differences in satisfaction conditions. Yet, as described, these are virtually identical, and only their direction differs. Rules are obeyed or not obeyed, and the state of affairs they describe and the actual state of affairs must be compared in order to assess whether their satisfaction conditions have been met. Epistemic statements can be true or false, and the state of affairs they describe and the actual state of affairs must be compared in order to assess whether their satisfaction conditions have been met.

To summarize, here are our points of agreement:

- No modules are needed to explain the deontic advantage.
- Deontic reasoning develops over time.
- The difference between norms and normative propositions is that the former are rules that require compliance, whereas the latter can be true or false.

The claims I make with which they disagree are as follows:

- Social norm reasoning is one type of deontic reasoning that has been the target of selective pressure.
- Development does not preclude nativism.
- Epistemic utterances make no greater processing demands than deontic utterances
- Adult norm reasoning performance is strongly influenced by reference to authority or implication of role of authority.

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