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BRIEF REPORT

The Role of Prescriptive Norms and Knowledge in Children's and Adults' Causal Selection

Jana Samland, Marina Josephs, Michael R. Waldmann, and Hannes Rakoczy
University of Goettingen

A widely discussed discovery has been the influence of norms on causal selection. Confronted with scenarios in which 2 agents contribute equally to an effect, adult participants tend to choose the agent who is violating a norm over an agent who is conforming to a norm as the cause of the outcome. To date, this effect has been established only in adult populations, so its developmental course is unknown. In 2 experiments, we investigated the influence of norm violations on causal selection in both 5-year-old children and adults. In particular, we focused on the role of mental state ascription and blame evaluation as potential mediating factors in this process. To this end, the knowledge status of the agent in question was varied such that she either was or was not aware of her norm transgression. Results revealed that children and adults assigned blame differently: Only adults were sensitive to the knowledge of the agent about norms as a mitigating factor. Crucially, however, despite its different sensitivity to knowledge ascription in children and adults, blame assignment in both age groups affected causal selection in the same ways. The relevance of these findings for alternative theories of causal selection is discussed.

Keywords: causal reasoning, moral judgment, development, causal selection, knowledge

The influence of causal judgments on normative evaluations is a well-established finding. For instance, we blame an agent for an outcome only when we think her behavior has actually caused the outcome (Cushman, 2008; Shaver, 1985; Sloman, Fernbach, & Ewing, 2009; Weiner, 1995). Recently, however, evidence for the inverse relation between causal and normative judgments has been presented: Normative evaluations seem to influence causal judgments (Alicke, Rose, & Bloom, 2011; Hitchcock & Knobe, 2009; Kominsky, Phillips, Gerstenberg, Lagnado, & Knobe, 2015; Phillips, Luguri, & Knobe, 2015). If two agents jointly contribute to an outcome and one of them violates a prescriptive norm, participants tend to select this norm-violating agent over the norm-conforming one as "the cause." In the *pen vignette* by Knobe and Fraser (2008), for example, participants read about employees working in a philosophy department. Although only the administrative assistants are allowed to take pens from the desk of the receptionist, the faculty members take pens regularly as well. One day, no pens are available after both a faculty member and an administrative assistant had taken pens. When asked about the cause of the problem, participants in the experiment tended to choose the faculty member who had violated the stated normative rule over the administrative assistant who did not do anything forbidden.

Different explanations of the influence of norms on causal judgments have been proposed. The *counterfactual account* of causal selection (Hitchcock & Knobe, 2009) builds on a long-standing tradition of counterfactual theories that assume that a factor is seen as cause if, had the factor not occurred, the outcome would not have occurred (e.g., Lewis, 1973). There is an infinite number of counterfactuals for every situation, so a key question is what counterfactual people actually consider. Various properties of counterfactuals have been considered, including their closeness to the actual world, the ease of imagining them, whether they represent the presence or absence of an event, the type of the underlying causal relation, or their relationship to norms (see, e.g., Kahneman & Miller, 1986; Kahneman & Tversky, 1982; Lombrozo, 2010; Mandel, 2003; Roese, 1997; Spellman & Kincannon, 2001; Wells & Gavanski, 1989).

Hitchcock and Knobe (2009) have focused on causal selection arguing for the relevance of norms. According to their theory, people reflect on the *counterfactual* possibility that an *abnormal* factor was normal rather than on the possibility that a normal factor was abnormal. The theory explains the selection of the faculty member in the pen vignette by the higher relevance of the counterfactual possibility in which she did not take a pen compared to the lower relevance of the counterfactual possibility that the administrative assistant who followed the norm had not taken a pen. Evidence for the role of counterfactual reasoning in causal selection comes from a number of recent studies with adults (e.g., Kominsky et al., 2015; Phillips et al., 2015).

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Jana Samland, Marina Josephs, Michael R. Waldmann, and Hannes Rakoczy, Department of Psychology, University of Goettingen, Goettingen, Germany.

Jana Samland and Marina Josephs contributed equally to this work and should therefore be regarded as joint first authors.

Correspondence concerning this article should be addressed to Jana Samland, Department of Psychology, University of Goettingen, Gosslerstr. 14, 37073 Göttingen, Germany. E-mail: jana.samland@psych.uni-goettingen.de

A second approach is the *culpable control model* (Alicke, 2000), which claims that the influence of norms on causal judgments is mediated by participants' blame assignment to the transgressor: Norm-violating behavior like the one of the faculty member elicits a blame response, which in turn—as a kind of post hoc rationalization—leads to the causal selection of the blameworthy action as causally crucial. Under which circumstances do norm violations elicit blame responses and thus affect causal selection? Like other blame theories, the culpable control model assumes that how the transgressor's action is interpreted is crucial. Blame assignment and the resulting causal exaggeration of an agent's causal role should be strongest if the agent brought about the outcome of her action knowingly and intentionally (Alicke et al., 2011; Lagnado & Channon, 2008).

In the initial discussions, the two theoretical approaches have been presented as competitors (e.g., Alicke et al., 2011; Hitchcock & Knobe, 2009). However, a more plausible possibility seems to be that they complement each other. In fact, Phillips et al. (2015) have demonstrated that counterfactual reasoning can be observed in various tasks, including judgments about freedom, causation, doing/allowing, and intentional action. They have not considered blame, but it may well be that blaming a person tends to trigger thoughts about what the person could have done instead (see the General Discussion section for further discussions).

Our goal was therefore not to empirically test between these two theories but to further investigate the role of blame in causal selection. Do factors that influence blame evaluations likewise influence causal selection? One such potential factor that has not been explicitly addressed by either theory is the epistemic status of the norm-violating agent.

To decide whether someone is to blame for norm-transgressing behavior, it is often mandatory to distinguish between knowing and ignorant norm violations. For example, offering meat to a vegan seems clearly more blameworthy when the host is fully aware of her guest's food preferences than when she is ignorant. Although ignorance does not serve as an excuse in front of the law (*Ignorantia juris non excusat*), empirical studies have suggested that individuals tend to judge ignorant norm violations as less morally wrong and less blameworthy compared to knowing ones (Cushman, 2008; Young & Saxe, 2011).

So what, then, is the relation between knowledge ascription to a norm-transgressing agent, blame assignment, and causal selection? Because both the link between knowledge ascription and blame assignment and the link between blame assignment and causal selection have been well documented in the literature (Alicke et al., 2011; Cushman, 2008; Lagnado & Channon, 2008; Young & Saxe, 2011), our general hypothesis is that knowledge ascription moderates blame evaluations, and blame (regardless of its relationship to counterfactual thought) is a mediator of causal selection. In the present study, we address this question from the point of view of cognitive development, exploring the influence of knowledge ascription on blame assignment and causal judgments in adults and young children.

A developmental approach is interesting in its own right because so far it is not known whether norm violations affect causal selection in young children. More importantly, however, developmental investigations present an interesting and stringent test case for the idea that the ascription of mental states moderates blame ratings, which in turn mediate causal ascriptions.

Developmental work concerning theory of mind and moral psychology has suggested that there are crucial cognitive differences between young children and adults in the way knowledge attribution and moral judgments are coordinated. Although children show an understanding of the difference between knowledge and ignorance from around age 3 or even earlier (e.g., Flavell, Flavell, Green, & Moses, 1990; see Wellman & Liu, 2004), the integration of knowledge ascription into normative evaluations seems to develop later. Three- and 4-year-old children do take into account the intentionality of an action when deciding who of two norm transgressors (accidental vs. intentional) is to blame (e.g., Harris & Núñez, 1996; Yuill & Perner, 1988). However, when it comes to integrating knowledge (in the form of foreknowledge of the outcome), it is not until the age of 6 to 7 that children blame unknowing agents less than knowing transgressors (Killen, Mulvey, Richardson, Jampol, & Woodward, 2011; Yuill & Perner, 1988).

An even more special case concerns knowledge of the rule itself. Recent work has found that 5-year-olds expect that an agent would act in accordance with a new rule even if the change of rules happened in her absence, and children assume that an ignorant agent would "get into trouble" for acting in accordance with the old rule (Kalish & Cornelius, 2007). Although to our knowledge no study has explicitly asked for children's blame attribution to unknowing agents, this literature suggests that 5-year-olds are more inclined to follow the "ignorance is no excuse" principle, discounting knowledge as a mitigating factor.

The rationale of the present study was to bring together hypotheses about the developmental course of blame attribution with theories of causal selection, which so far have been tested only in adults. Our central hypothesis is that causal selection is a function of blame judgment, with knowledge ascription as a potential moderating factor. One possible developmental course may be that ascribed knowledge of the norm moderates blame and in turn causal selection similarly across different age groups. Thus, in this case one would expect that a norm-violating agent who is aware of the norm would be blamed more and therefore preferentially chosen in a causal selection task compared with an agent who is not aware of her misbehavior. However, the developmental work reviewed above suggests a different developmental course: Blame assignment may be less sensitive to knowledge ascription early in development because young children seem to blame agents for norm-violating behavior regardless of their knowledge. If causal selection tracks blame judgments across development, one would in this case expect a more-nuanced developmental pattern of strong norm effects on causal selection regardless of knowledge in the younger but not in the older group.

Experiment 1

To set the stage for exploring the role of knowledge on blame judgments and causal selection in Experiment 2, we focused in Experiment 1 on the question of whether norm violations influence causal selection in both young children and adults. We created a child-friendly version of the pen vignette to be able to investigate this question in both age groups.

Method

Participants. We included 48 five-year-old children (M = 65.63 months, SD = 3.64, range = 60–71 months) and 102 adults (M = 35.37 years, SD = 10.03) in our analyses. The children were tested individually by one of two experimenters in several day care centers in Goettingen, Germany; the adults took part in an online study that was conducted in the United Kingdom. The adults received 50 British pence for their participation. One additional child and 15 more adults participated in the study but were excluded from the analyses because they failed to correctly answer one or both of two control questions.

Procedure. Children were presented with a 3-min video whose content was an adaptation of the pen vignette by Knobe and Fraser (2008). The adult group read a verbal description of the adapted story. Participants were randomly assigned to one of two conditions, the norm-violation or the control condition.

Participants observed or read about the following events: A bear and a hedgehog were shown a box full of colored pencils. Then rules regulating who is allowed to take pencils were presented. In the norm-violation condition, the rules were that only bears were allowed to take pencils, whereas hedgehogs were not allowed to take them. In the control condition, the rules said that both hedgehogs and bears were allowed to take pencils. Irrespective of these prescriptive norms, however, both animals alternately took pencils out of the box six times. Next, a situation was presented in which both the hedgehog and the bear came to the box and simultaneously took a pencil. A short time later, another animal, a polar bear, approached the box seeking a pencil to do its homework. However, there were no pencils left in the box. After having been presented with the story, participants were asked the test question (in German) "What do you think: Who has made the problem, the hedgehog or the bear?"[1] The order of the animals in the test question was counterbalanced across participants. The test question was followed by two control questions, checking for participants' understanding of the normative status of the two animals.

Results and Discussion

Figure 1 shows the percentage of children and adults choosing the hedgehog, the bear, both, neither, or someone/something else as the answer to the test question. Generally, both children and adults judged that the hedgehog "made the problem" more often in the norm-violation condition, in which the hedgehog was prohibited from taking pencils, than in the control condition, which allowed both animals to take pencils, $\chi^2(1) = 6.857$, $p = .009$, Cramer's $V = .378$, for the children and $\chi^2(1) = 55.219$, $p < .001$, Cramer's $V = .736$, for the adults. The distribution of the different types of answers differed significantly between conditions for the children, $\chi^2(2) = 8.622$, $p = .013$, Cramer's $V = .424$, and for the adults, $\chi^2(4) = 60.955$, $p < .001$, Cramer's $V = .773$. For children and adults, the answer "hedgehog" was the modal response in the norm-violation condition (children: binomial test, 15 out of 24, test value = .33, $p = .003$; adults: binomial test, 42 out of 53, test value = .20, $p < .001$). In the control condition, the answer "both" was the most frequent answer for children (binomial test, 13 out of 24, test value = .33, $p = .028$). For adults, the number of "both" and "none" answers (indicating no preference for one of the two causes) dominated in the control condition (binomial test, 30 out of 49, test value = .40, $p = .002$). These results indicate that 5-year-olds, like adults, take normative evaluations into account when they respond to a causal selection query.

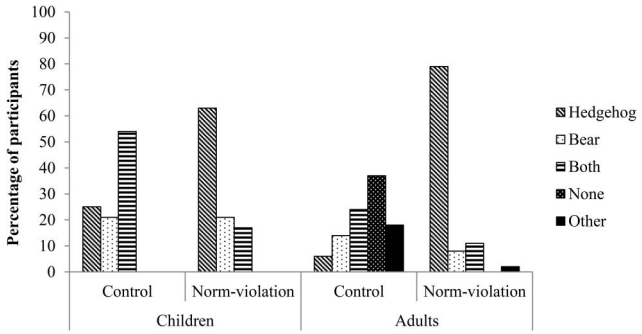

Figure 1. Comparison of participants' answers to the test question in Experiment 1. Whereas only three different types of answers were given by the 5-year-olds (i.e., "hedgehog," "bear," "both"), the answers given by the adults could be classified into five categories (i.e., "hedgehog," "bear," "both," "neither," "other").

Experiment 2

Experiment 1 established that norms affected causal selection in both children and adults in our new scenario. This finding allowed us to investigate the role of the agent's knowledge of the norm in Experiment 2.

Method

Participants. Forty-seven 5-year-olds (M = 64.23 months, SD = 3.02, range = 60–71 months) and 50 adults (M = 25.06 years, SD = 4.51, range = 19–40 years) were included in our analyses. As in Experiment 1, children were tested individually. The adult participants were predominantly undergraduates of the University of Goettingen recruited and tested on campus. Thirteen more children and five more adults took part in the study but were excluded due to one or more wrong answers to the control questions at the end of the experiment. The larger number of dropouts compared to the first experiment is probably due to the introduction of two additional control questions, which increased the number of opportunities for failure.

Procedure. The procedure in Experiment 2 largely resembled that in Experiment 1. One difference was that now the norm regulating who was allowed to take pencils was identical in the contrasted conditions. Thus, in both conditions only bears (but not hedgehogs) were allowed to take pencils. What was manipulated between conditions was the hedgehog's knowledge of this prescriptive norm. In the *ignorance condition* the hedgehog was absent when the new rule about pencil use was announced, so it had no knowledge about the norm. By contrast, in the *knowledge condition* the hedgehog was present when the norm was announced, and it therefore knew about the new norm. The rest of the sequence was identical to that in Experiment 1, ending with the

[1] We used the verb *made* instead of *cause* (which was used in the original pen vignette) because previous studies had shown that young children often have difficulties understanding the verb *cause.*

polar bear unsuccessfully looking for a pen to do its homework. For reasons of better comparability, the adults no longer read a verbal description of the scenario as in Experiment 1 but saw the same video as did the children and were then asked to answer the test questions in a paper-and-pencil format.[2] For both children and adults, the same test question as in Experiment 1 ("What do you think: Who has made the problem, the hedgehog or the bear?") was followed by the two control questions that checked whether the rule was understood and by two new control questions that asked whether each agent knew about the rule. Additionally, we asked participants to give a blame judgment for both animals using a yes/no question ("Is the hedgehog/bear to blame?").

Results and Discussion

The distribution of answers to the causal selection question are shown in Figure 2. Whereas adults chose the hedgehog more often in the knowledge condition (when it knowingly broke the rule) compared to the ignorance condition, in which it was not aware of the rule, $\chi^2(1) = 8.013$, $p = .005$, children chose the hedgehog equally often in both conditions, $\chi^2(1) = 0.561$, $p = .454$. Figure 3 shows the distribution of answers to the blame question. Note that answers were coded as "both" if participants answered both blame questions as "yes" and as "none" if both questions were answered with "no." As expected, adults' judgments of blame were moderated by the agent's knowledge, $\chi^2(3) = 24.99$, $p < .001$: "hedgehog" was the dominant answer in the knowledge condition (binomial test, 17 out of 25, test value = .25, $p < .001$), whereas it was significantly underrepresented in the ignorance condition (binomial test, 0 out of 24, test value = .25, $p = .001$). Children's blame judgments did not differ between conditions, $\chi^2(2) = 0.979$, $p = .806$: "hedgehog" was the dominant answer both in the ignorance condition (binomial test, 17 out of 24, test value = .25, $p < .001$) and in the knowledge condition (binomial test, 17 out of 23, test value = .33, $p < .001$). For both adults and children there was a significant correlation between selecting the hedgehog as target in the causal test question and selecting it in the blame question (adults: $r = .543$, $p < .001$; children: $r = .497$, $p < .001$).

In sum, the results are consistent with the view that causal selections are mediated by blame judgments. Agents who are blamed for norm violations tend to be chosen as "the cause" in a causal selection task. What differs across age groups is how blame judgments are generated. Whereas the older group takes into account knowledge, thus blaming ignorant agents less than knowing ones, the younger group blames norm-violating behavior regardless of the agent's knowledge.

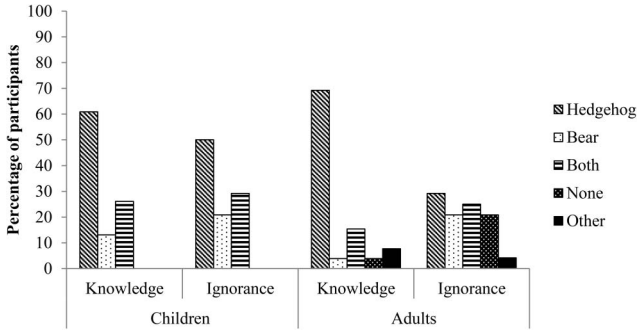

Figure 2. Comparison of participants answering the causal selection question in Experiment 2 with "hedgehog," "bear," "both," "none," or "other."

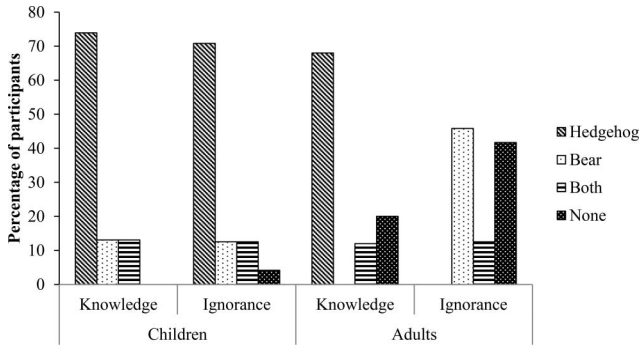

Figure 3. Comparison of participants blaming the hedgehog, the bear, both, or none in Experiment 2. Both 5-year-olds and adults produced four different types of answers (i.e., "hedgehog," "bear," "both," "none").

General Discussion

The main aim of the current study was to investigate the relations between knowledge ascription, blame assignment, and causal selections in children and adults. We developed a child-friendly version of Knobe and Fraser's (2008) pen vignette in order to test both adults and 5-year-old children. The results show that perceived norm violations affect causal selections in both age groups and that blame seems to be a mediator of this effect. In Experiment 2 we investigated the role of knowledge about norms. As expected, adults blamed agents who knowingly violated norms more than they did ignorant norm violators. Moreover, they were more likely to select the knowing than the ignorant norm violator as the cause. By contrast, no effect of knowledge was found in children. Children blamed both the knowing and ignorant agents and equally selected knowing and ignorant transgressors as the cause.

These findings have several implications. First, there are fundamental developmental changes in the way epistemic evaluation and blame assignment are related. In contrast to adults, who refrained from blaming the unknowing agent, children in our study focused on the fact that a norm was violated and disregarded knowledge as a mitigating factor. These results converge with previous findings that young children do not consider the agent's ignorance about action outcomes (Yuill & Perner, 1988) or rules (Kalish & Cornelius, 2007) in making their normative evaluation. But why is it so difficult to integrate information about the agent's knowledge for her normative assessment? After all, even much younger children can distinguish between accidental and intentional transgressions (e.g., Yuill & Perner, 1988). One possible

[2] We also conducted the study as an online experiment with 110 adults ($M = 37.93$ years, $SD = 10.13$) in which participants read a verbal description of a slightly modified scenario. The patterns of significant effects did not differ across both versions, which demonstrates the equivalence of the online-based adult data and the data of the individually tested children in Experiment 1.

explanation might be that the intentional structures of the actions in question are quite different. Whereas studies on children's evaluations of accidental/intentional transgressions contrasted one action performed intentionally and another action that happened accidentally, the contrast in the present studies is much more subtle: There are two identical actions that are always intentional (i.e., taking a pen). The crucial difference is the epistemic status of two agents vis-à-vis a norm (knowledge vs. ignorance). It was thus the norm violation and not the action itself that was either intentional or unintentional, placing the unintentionality on a more abstract level. Future studies are needed to investigate more systematically how children come to develop an understanding of these different forms of (un)intentionality and how this factor affects their norm reasoning.

Second, even though blame is assigned differently as a function of the epistemic status of the agent across development, causal judgments seem to be a function of blame assignment in both age groups. This pattern of unitary correlations between blame judgments and causal selection in both age groups is largely consistent with the culpable control model (Alicke, 2000): Whether an agent is causally selected depends on whether she is blamed. The new finding for this account is that blame is differentially moderated by knowledge in the compared age groups.

Do these findings then favor the culpable control model over the alternative counterfactual account (Hitchcock & Knobe, 2009)? Not necessarily. In the introduction we already pointed out that the two accounts do not need to contradict each other, although initially this has been claimed by the protagonists of the competing accounts (e.g., Alicke et al., 2011; Hitchcock & Knobe, 2009). In our view, counterfactual reasoning may well be a component of assigning blame. It may be that blame triggers counterfactual thinking about what the scolded agent should have done instead, whereas one may not tend to think about alternative actions if the agent had done the right thing.

However, the counterfactual approach needs to be considerably elaborated to fully account for our findings. For one thing, the role of knowledge has not been addressed yet. The main claim of the present version of this theory is that abnormal factors elicit reasoning about the counterfactual normal state, but to account for our effects it needs to be further specified how abnormality intuitions are generated and how knowledge ascriptions affect this process. A further important open question is whether counterfactual reasoning precedes or follows blame judgments. Phillips et al. (2015) preferred the first possibility, but they acknowledged that both possibilities equally fit their data. Finally, more direct empirical tests of whether children reason about counterfactuals in causal selection tasks would be desirable. There is plenty of evidence for counterfactual reasoning, broadly construed, in young children (e.g., Harris, German, & Mills, 1996), but there are also findings that point to important developmental differences (see Beck, Riggs, & Burns, 2011; Rafetseder & Perner, 2014).

All in all, the present findings reveal interesting developmental similarities and differences in the ways children and adults coordinate knowledge ascription, blame assignment, and causal judgment. They are consistent with an extended version of the culpable control model (Alicke, 2000), but a better integration of this theory with the counterfactual account seems to be an interesting goal for future research.

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