A social cognitive developmental perspective on moral judgment

Larisa Heiphetz[1] & Liane Young[1]

[1] Boston College, Chestnut Hill, MA 02467

In press at *Behaviour*

Address correspondence to:
Larisa Heiphetz
Department of Psychology
Boston College
140 Commonwealth Avenue
Chestnut Hill, MA 02467
Email: larisa.heiphetz@bc.edu
Phone: 617-552-0240

1   **Abstract**

2   Moral judgment constitutes an important aspect of adults' social interactions. How do adults'

3   moral judgments develop? We discuss work from cognitive and social psychology on adults'

4   moral judgment, and we review developmental research to illuminate its origins. Work in these

5   fields shows that adults make nuanced moral judgments based on a number of factors, including

6   harm aversion, and that the origins of such judgments lie early in development. We begin by

7   reviewing evidence showing that distress signals can cue moral judgments but are not necessary

8   for moral judgment to occur. Next, we discuss findings demonstrating that both children and

9   adults distinguish moral violations from violations of social norms, and we highlight the

10   influence of both moral rules and social norms on moral judgment. We also discuss the influence

11   of actors' intentions on moral judgment. Finally, we offer some closing thoughts on potential

12   similarities between moral cognition and reasoning about other ideologies.

13

14   Keywords: harm aversion, moral cognition, social cognitive development

15

16
17   **A social cognitive developmental perspective on moral judgment**

18   Moral judgment—reasoning about whether our own and others' actions are right or

19   wrong—is a fundamental aspect of human cognition, informing a variety of social decisions.

20   This paper investigates the origins of adults' moral judgments, focusing on moral judgments in

21   the domain of harm. We begin by discussing distress signals that could indicate that harm has

22   occurred and could therefore serve as strong elicitors of moral judgment. We challenge the

23   notion that such signals are required for moral judgments by discussing research demonstrating

24   that moral judgment often occurs in their absence. We then turn to a discussion of **social domain**

25   **theory** and present evidence showing that children, like adults, distinguish moral violations from

26   violations of social norms and that social norms can influence moral judgment. Next, we discuss

27   research on **theory of mind** showing that the moral judgments of neurotypical children and

28   adults depend on information about others' intentions (Figure 1). Finally, we discuss links

29   between moral cognition and other domains.

30   **The Role of Others' Distress in Moral Judgment**

31   Adults typically experience emotional aversion when asked to perform harmful actions

32   such as discharging a gun in someone's face (Cushman, Gray, Gaffey, & Mendes, 2012). Harm

33   aversion is so common that it may appear, at first glance, to constitute the entirety of moral

34   cognition. Though Graham and colleagues (2011) have identified additional moral domains,

35   harm appears important across a broad spectrum of participants. Unlike other domains that vary

36   in importance across demographic categories, harm influences cognition across diverse cultures

37   (Haidt, 2012), among liberals and conservatives (Graham, Haidt, & Nosek, 2009), and even

38   among some non-human primates (Sheskin & Santos, 2012). Indeed, some definitions of

39   morality include only the domain of harm. For example, de Waal (this issue) defines morality as

40   "helping or at least not hurting fellow human beings."

41   For this review, we define harms as acts that injure others physically, emotionally, and/or

42   materially. People might reason about different kinds of harm in different ways, yet a variety of

43   actions (e.g., hitting, name-calling, stealing) can still be considered harmful. We use the term

44   "harm aversion" to refer to moral condemnation of harmful actions. We focus on moral

45   judgment rather than moral behavior because the bulk of current research in moral psychology

46   focuses on the former. We argue that harm aversion plays a large role in moral judgment across

47   development but that moral judgment depends on other factors as well. Specifically, both

48   children and adults consider additional aspects of the situation, such as relevant social norms and

49   information about an actor's intentions. Though we focus on the developmental origins of moral

50   judgment, much research has also investigated morality's evolutionary origins (see Boehm, this

51   issue; de Waal, this issue; Joyce, this issue).

52   One of the clearest ways to tell that harm has occurred is by observing victims'

53   expressions of pain. Researchers have argued that people have evolved to respond to distress

54   signals by ceasing aggression. For example, building on the work of ethologists such as Eibl-

55   Eibesfeldt (1970) and Lorenz (1966), psychologist James Blair proposed that people who are

56   healthy have a violence inhibition mechanism (VIM) that is activated by cues such as crying

57   (Blair, 1995; Blair & Morton, 1995). In other words, crying signals that harm is occurring and

58   should be stopped. Blair argues that the VIM has a long evolutionary history; for example, dogs

59   typically do not kill opponents who bare their throats in a fight, suggesting that some

60   mechanisms have evolved to prevent death in the midst of conflict. Similarly, most people inhibit

61   aggression in the face of others' distress.

62   Investigations of infants have found evidence consistent with the idea that harm—and

63   signals that harm has occurred—is aversive early in development. For instance, newborns cry in

64   response to another infant's cries (Martin & Clark, 1982; Sagi & Hoffman, 1976; see Ainsworth,

65   Blehar, Waters, & Wall, 1978, for a discussion of the functions of infant crying). Suggestive as it

66   is, such evidence is open to multiple interpretations. For instance, infants may experience

67   empathy at another's distress (regardless of whether or not they find the distress itself aversive),

68   or they may simply be irritated at a disturbance of the peace, or they may infer the presence of a

69   threat in their own environment. Because infants are limited in the types of responses they can

70   provide, it is difficult to disentangle these possibilities among this population. However,

71   evidence from older toddlers can help identify the role these potential factors may play later in

72   development.

73   One way to obtain such evidence is to observe older infants' and toddlers' provisions of

74   comfort to those who have experienced harm. Such behavior is not specific to humans (Romero,

75   Castellanos, & de Waal, 2010; Romero & de Waal, 2010), showing the long evolutionary history

76   of comforting others. Work with human children has shown that neither 18-month-old nor 24-

77   month-old infants comforted an adult who expressed physical pain after hurting her knee, though

78   a minority of participants in both age groups exhibited self-soothing behaviors such as sucking

79   their thumb or touching their own knee (Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011).

80   Slightly older toddlers did show greater concern for victims of harm (Zahn-Waxler, Radke-

81   Yarrow, Wagner, & Chapman, 1992). Although some two-year-olds may be predisposed to

82   respond to others' distress with empathy (Nichols, Svetlova, & Brownell, 2009), toddlers of this

83   age do not always seek to redress those harms in ways typically used by older children and adults

84   (e.g., comforting). It is not until the age of three that toddlers reliably comfort adults who have

85   been harmed by others by sharing their own resources or making suggestions for how the adult

86   can feel better. Toddlers of this age also attempt to prevent harms by telling agents performing

87   negative behaviors to stop (Vaish, Missana, & Tomasello, 2011).

88   At this point, it may be useful to consider what factors constitute the signatures or

89   precursors of moral judgment for young children. How might we know when children make

90   moral judgments? Self-soothing does not appear to be a strong cue, as this behavior can indicate

91   self-oriented goals that do not concern morality. Comforting others may serve as a better cue in

92   later toddlerhood, but these behaviors do not tend to emerge until around age three and may also

93   indicate self-oriented goals. For example, older toddlers may comfort others to put an end to the

94   distress signals that they find aversive.

95   Attempting to stop harmful behaviors, as three-year-old toddlers in Vaish and colleagues'

96   (2011) work did, may serve as a stronger indication that toddlers are making a moral judgment.

97   Such behavior (i.e., confronting the harm-doer) may lead to distress in the perpetrator of the

98   harm and is therefore unlikely to serve a self-oriented goal of ending all distress cues. Rather,

99   three-year-old toddlers who attempt to stop harmful behaviors may be indicating that they find

100   these behaviors morally objectionable. Yet other explanations are possible in this case as well,

101   since even non-human animals can attempt to stop behaviors that harm others. For example,

102   bears can aggress against those harming their cubs, and dogs can attempt to prevent harm from

103   occurring to their owners. Such interventions can occur for a number of reasons, including kin

104   selection and human training (e.g., dogs may be trained to attack people or animals who attempt

105   to harm their owners), and may not always indicate moral judgment. Perhaps due to the difficulty

106   of inferring moral judgment from behavior, much work in moral psychology has relied on asking

107   direct questions (e.g., whether a particular behavior was okay or not okay).

Evidence that Distress Signals are not Necessary for Moral Judgment

108

109   The previous section describes instances in which young toddlers comfort the victim or

110   confront the harm-doer, but recent work reveals instances when young toddlers and even infants

111   perceive and respond to immoral actions in the absence of distress signals (see Hamlin, 2012, for

112   a review). Thus, early moral cognition may be more nuanced than a simple formula in which

113   "distress signals = harm = immorality." Indeed, infants and young toddlers may have some

114   understanding of morality despite their failure to exhibit this understanding through their

115   behaviors. Individuals in these age groups may understand some behaviors to be immoral but fail

116   to act on this understanding in ways typical among older individuals (e.g., comforting victims).

117   In one series of studies, Hamlin and colleagues (Hamlin & Wynn, 2011; Hamlin, Wynn,

118   & Bloom, 2007, 2010) showed infants displays featuring "helpers" (e.g., one character

119   facilitating another character's goal to climb up a hill) and "hinderers" (e.g., one character

120   preventing another character from climbing up a hill). As indicated by a variety of measures,

121   including reaching and looking time, infants preferred helpers to hinderers. This occurred even

122   though the characters were portrayed by shapes lacking emotional expressions (e.g., distress). In

123   a different study, two-year-old toddlers showed greater concern for an adult whose property had

124   been destroyed or taken away even if the adult did not display any emotional distress (Vaish,

125   Carpenter, & Tomasello, 2009). These studies show that infants and toddlers are sensitive to

126   harm even when victims have not indicated they have experienced harm or are in distress.

127   In summary, even infants appear to distinguish help from harm. Infants and toddlers do

128   not require visible signs of distress to infer that harm has occurred; rather, they prefer helpers

129   over hinderers even in the absence of distress signals. Though infants are unable to articulate

130   their internal states, their preferences for helpers have been interpreted as a form of moral

131   judgment (e.g., Hamlin, 2012). Below we discuss evidence that social norms and moral rules can

132   also impact moral judgment in the absence of distress signals, providing further evidence that

133   such signals are not necessary for moral judgment to occur.

134   **The Role of Norms and Rules in Moral Judgment**

135   **The role of social norms in moral judgment.** Much of human behavior, like the

136   behavior of some non-human animals (e.g., dogs [Bekoff, 2001] and monkeys [de Waal, 1993]),

137   is influenced by social norms. Toddlers seem to acquire an understanding of norms around three

138   years of age. At this milestone, they begin to infer that actions are normative (that is, they

139   "should be" done a particular way) when an adult simply demonstrates the action with

140   familiarity, even in the absence of pedagogical or language cues (Schmidt, Rakoczy, &

141   Tomasello, 2011). Furthermore, three-year-old toddlers protest when actors violate context-

142   dependent norms such as the rules of a particular game (Rakoczy, 2008; Rakoczy, Brosche,

143   Warneken, & Tomasello, 2009; Rakoczy, Warneken, & Tomasello, 2008; Wyman, Rakoczy, &

144   Tomasello, 2009). Three-year-old toddlers accept norms concerning sharing, though they fail to

145   follow these norms themselves. For example, they report that they and others should share

146   stickers equally, though children do not typically distribute valued resources equally until they

147   reach approximately 7 years of age (Smith, Blake, & Harris, 2013). Three- and four-year-olds

148   also tattle to authority figures when their siblings and classroom peers violate rules and norms

149   (Ross & den Bak-Lammers, 1998); in one line of work, such tattling represented the majority of

150   children's statements about their peers to third parties (Ingram & Bering, 2010). Toddlers who

151   tattled on siblings tended to emphasize harmful actions such as physical aggression (den Bak &

152   Ross, 1996), suggesting that even toddlers may view rules against harm as especially important,

153   or at least recognize that their parents may take this view.

154   In many instances, toddlers distinguish social norms from moral rules, which are

155   proscriptions against behaviors that result in negative outcomes towards others (Lockhart,

156   Abrahams, & Osherson, 1977; Nucci, 1981; Smetana, 1981; Smetana, Schlagman, & Adams,

157   1993; Turiel, 1983; for a more thorough review of children's differentiation of social norms from

158   moral rules, see Killen & Rizzo, this issue). For example, three-year-old toddlers enforce moral

159   rules equally for in- and out-group members but enforce conventional norms more for in-group

160   members (Schmidt, Rakoczy, & Tomasello, 2012). In Schmidt and colleagues' study, toddlers

161   met puppets speaking in a native or foreign accent and then saw these puppets violate either

162   moral rules (e.g., damage someone's property) or conventional norms (e.g., play a game the

163   "wrong" way). Toddlers protested equally when actors violated moral rules regardless of group

164   membership but protested more when in-group rather than out-group actors violated

165   conventional norms, demonstrating an understanding that group membership likely exerts a

166   stronger influence on conventional norms.

167   Although toddlers distinguish conventional social norms from moral rules, they also use

168   information about the former to inform their evaluations of the latter. For example, in one study

169   (Hepach, Vaish, & Tomasello, in press), three-year-old toddlers played a drawing game with two

170   experimenters. One experimenter showed the second experimenter how to cut a piece of paper in

171   one of three ways: (1) cutting a blank piece of paper, (2) cutting a small section of the second

172   experimenter's paper without destroying the drawing on the paper made by the second

173   experimenter, or (3) cutting across the entire drawing made by the second experimenter. The

174   second experimenter then displayed emotional distress. Three-year-old toddlers displayed

175   concern for the second experimenter only when she appeared justifiably upset, i.e. when her

176   picture had been destroyed in the third condition. Specifically, children checked up on the

177   experimenter and helped her with a subsequent task. Children responded with similar levels of

178   concern when they were not privy to information about why the experimenter was upset; that is,

179   without specific evidence of **unjustified** distress, children assumed the response to be justified.

180   However, when the experimenter responded with strong distress to a minor harm (e.g., when the

181   paper was cut, but the drawing was left intact), children showed significantly less sympathy.

182   That is, in a situation where "victims" expressed great distress in response to a socially

183   normative action (e.g., cutting a small piece of paper), toddlers appeared to view the distress as

184   unjustified. Preschoolers with autism showed this same "crybaby effect", by sympathizing more

185   in the case of justified distress; this aspect of moral cognition may thus be spared despite other

186   social-cognitive impairments among individuals with autism (Leslie, Mallon, & DiCorcia, 2006).

187   **The role of rules in moral judgment.** In addition to social norms, which are perceived

188   to vary across contexts (Smetana, 1981; Smetana et al., 1993; Turiel, 1983), other more broadly

189   applicable rules can also govern moral judgment. In fact, both Piaget (1932) and Kohlberg

190   (1969) proposed that during the early stages of moral development, moral judgment is primarily

191   rule-based. For example, a child whose moral reasoning is at the pre-conventional stage (in

192   Kohlberg's terminology) might claim that it is wrong for a man to steal a drug that will save his

193   wife's life because stealing is against the rules.

194   More recent work has investigated the importance of rules to older children and adults. In

195   one study (Lahat, Helwig, & Zelazo, 2012), for example, 8- to 10-year-old children, 12- to 13-

196   year-old adolescents, and undergraduates read identical stories with endings slightly altered to

197   create violations of moral rules or violations of social norms. For example, in one story, Alice

198   saw her sister's pajamas in her closet. Alice then decided to shred them (moral violation) or wear

199   them to school (conventional violation). Participants were asked to press one key as quickly as

200   possible if they thought the behavior was "OK" and a different key if they thought the behavior

201   was "NOT OK." During half of the trials, participants were instructed to imagine that there was

202   no rule against the behavior (rule removed condition). During the other half, participants were

203   given no specific instructions and were assumed to operate as though a rule prohibited the

204   violations (rule assumed condition). In the rule assumed condition, participants of all ages judged

205   moral violations to be wrong more quickly than they judged conventional violations to be wrong;

206   in the rule removed condition, participants responded equally quickly across these conditions.

207   This suggests that judgments concerning conventional violations require additional cognitive

208   processing and that the presence of rules can alter the ease with which people make moral

209   judgments.

210   Additionally, adults responded more quickly that moral violations were wrong in the rule

211   assumed condition. Lahat et al. (2012) offer two explanations for this finding. First, adults may

212   have been surprised by the lack of rules against moral violations. Second, adults may have

213   considered the context in which moral violations took place. This latter explanation is at odds

214   with social domain theory (Smetana, 2006), which argues that context influences only judgments

215   concerning conventional violations, not judgments concerning moral violations. However, this

216   interpretation is in line with additional research drawing on the philosophy literature.

217   Specifically, Nichols and Mallon (2006) drew on the famous trolley problem to

218   investigate the role of rules in moral judgment. Two versions of this dilemma exist. In the

219   **bystander** case, individuals are asked to imagine a person standing by a trolley track. This

220   bystander sees five people working on the tracks and also notices a train heading directly toward

221   them. If the bystander does nothing, the train will kill the people on the track. However, the

222   bystander has the option to flip a switch, causing the train to switch to another track and kill a

223   sole individual there. Participants are typically asked whether it is morally acceptable to flip the

224   switch. The **footbridge** case presents a similar dilemma, with one twist: now there is no switch

225   to pull. Rather, the individual observing the train has the option of pushing another individual

226   (typically a large stranger) in front of the train. This action would kill the stranger but save the

227   lives of the people working on the track. In both cases, claiming that it is acceptable to sacrifice

228   one life to save five reflects **utilitarianism**. Though the utilitarian option ultimately results in

229   more saved lives, several philosophers have asserted that it is not always the moral option

230   (Quinn, 1989; Thomson, 1976), and this non-utilitarian intuition has been strengthened by

231   presenting the dilemma in terms of the trolley problem rather than in abstract terms.

232   In recent empirical work, adults made different judgments in the bystander scenario and

233   the footbridge scenario. Healthy adults are more likely to endorse the utilitarian option in the

234   bystander scenario than in the footbridge scenario (Côté, Piff, & Willer, 2013; Greene,

235   Sommerville, Nystrom, Darley, & Cohen, 2001; Shallow, Iliev, & Medin, 2011). This difference

236   may reflect an emotion-based aversion to harming others via direct physical contact (Greene et

237   al., 2001). Most people hold an intuition that harming others is wrong, and they may search for

238   cognitive reasons to justify this emotional intuition when presented with the footbridge scenario

239   (Haidt, 2001, 2012; Hume, 1739).

240   To investigate the role of context on moral judgments, Nichols and Mallon (2006) altered

241   the basic bystander and footbridge scenarios by presenting participants with stories featuring

242   "victims" that were teacups rather than people. These scenarios included the same cost : benefit

243   ratios as traditional trolley dilemmas (e.g., sacrificing five to save one); however, these ratios are

244   applied to inanimate objects. In both scenarios, a mother tells her child not to break any teacups

245   and then leaves. A situation then occurs where a toy vehicle is likely to run over multiple

246   teacups. The child saves multiple teacups either by diverting the train away from multiple cups

247   and causing it to crush one solitary cup ("bystander" scenario) or by throwing one teacup at the

248   vehicle and breaking that one cup in the process ("footbridge" scenario).

249   Mimicking results from research using similar scenarios with people rather than teacups,

250   participants were more likely to say that the child broke a rule in the "footbridge" scenario.

251   However, moral judgments differed depending on whether the scenario was about people or

252   cups. When the scenario was about people, the majority of participants reasoned that it was not

253   okay to violate the rule, but when the scenario was about teacups, the majority of participants

254   reasoned that violating the rule was acceptable (Nichols & Mallon, 2006). The authors

255   interpreted these findings to mean that moral judgments in the case of people are guided by a

256   moral rule against harm ("do not kill innocent people") that does not apply to the teacup case.

257   That is, Nichols and Mallon (2006) interpreted their data in a way consistent with one potential

258   explanation of the data obtained by Lahat et al. (2012), arguing that context (people vs. teacups)

259   may influence moral judgments.

260   In summary, individuals do not respond inflexibly to distress signals when making moral

261   judgments. Rather, children and adults consider the context of the display as well as relevant

262   rules and social norms governing appropriate responses. Tears alone do not mean that harm has

263   occurred or that moral judgment is required.

264   **The Role of Others' Intent in Moral Judgment**

265   An additional role for context in moral judgment concerns the influence of intent. One

266   interpretation that individuals may make of distress signals is the following: distress signals in a

267   victim do not necessarily indicate that another person intended to harm the victim. That is,

268   person A may have harmed person B, and an observer may interpret this event differently

269   depending on whether the harm was intentional or accidental. Just as participants may reason

270   that distress in response to socially normative behaviors does not necessarily mean that harm has

271   occurred, participants may also use information about actors' intentions to determine the extent

272   to which their actions, including harmful actions, are morally wrong. (For evidence that

273   reasoning about intent has ancient evolutionary origins and that this ability can be found among

274   non-human primates, see Call, Hare, Carpenter, & Tomasello, 2004; Phillips, Barnes, Mahajan,

275   Yamaguchi, & Santos, 2009).

276   The study of intent has a rich history in psychology and related fields (see also the

277   discussion in Killen & Rizzo, this issue). For example, Piaget (1932) showed that young children

278   claimed that it was worse to accidentally make a large ink stain than to intentionally make a

279   small one, showing that they prioritized outcomes over intentions. Only between the ages of 6

280   and 10 years did children in Piaget's work begin to prioritize information about intent. Below,

281   we discuss more recent work suggesting that intent may begin to influence moral judgment

282   earlier in development than previously thought.

283   **The Development of Theory of Mind.** Moral judgments require people to be able to

284   reason about the contents of others' minds, including people's intentions and beliefs. The ability

285   to do so is called **theory of mind**. A standard test of theory of mind—the false belief task—asks

286   children to distinguish their own knowledge from the knowledge of another person. In a classic

287   version of the task, a central character (Sally) places an object in a particular location and then

288   leaves the room, at which point another character (Anne) surreptitiously moves the hidden object

289   to a different location. The experimenter then asks participants where Sally will look for the

290   object when she returns to the room. Toddlers younger than four years old typically respond that

291   Sally will search in the object's current location, despite the fact that Sally had no way of

292   knowing that the object was moved (see Wellman, Cross, & Watson, 2001, for a review).

293   Researchers have used such findings to argue that infants and young toddlers do not represent

294   others' minds as different from their own; that is, before reaching four years old, children think

295   that everyone has access to the same knowledge (e.g., Wimmer & Perner, 1983). However, more

296   recent findings (see Baillargeon, Scott, & He, 2010, for a review) indicate that false belief

297   understanding may emerge in the second year of life, suggesting that even infants may represent

298   others' beliefs, even if those beliefs differ from their own. (For a discussion of theory of mind

299   among non-human primates, see de Waal & Ferrari, 2012; Heyes, 1998; Premack & Woodruff,

300   1978).

301   **The Development of Intent-Based Moral Judgments.** Supporting the claim made by

302   Baillargeon and colleagues that even infants can reason about others' mental states, a number of

303   experiments have shown that, beginning in infancy, individuals' responses to and moral

304   evaluations of actors depend on the actor's intent. One line of work (Dahl, Schuck, & Campos, in

305   press) suggests that preferential helping based on intent emerges gradually over the first two

306   years of life. In this study, 17- and 22-month-old infants had the opportunity to help actors who

307   had previously acted pro-socially or anti-socially. Infants helped both actors equally. Two-year-

308   old toddlers preferentially helped the pro-social actor when given a choice between helping the

309   two actors but were willing to help the anti-social actors when the pro-social actor was not

310   present.

311   In another line of work (Hamlin, in press), 8-month-old infants preferred characters who

312   intended but failed to help others over characters who intended but failed to harm others. That is,

313   infants preferred characters with good intentions rather than characters associated with good

314   outcomes. Furthermore, infants failed to distinguish between characters who intended but failed

315   to help and characters who helped successfully. Older (21-month-old) infants showed their

316   preferences in their behaviors; they selectively helped actors who, in a previous interaction,

317   intended to provide a toy, regardless of whether the actors succeeded or failed in carrying out

318   their goal to help (Dunfield & Kuhlmeier, 2010). Three-year-old toddlers provided less help to

319   actors who had performed harmful actions in the past or who demonstrated that they had harmful

320   intentions, even in the absence of actual harms (Vaish, Carpenter, & Tomasello, 2010). And, like

321   adults, four-year-olds judged intentional harms to be worse than accidental harms and showed

322   greater emotional arousal, as measured by pupil dilation, to scenarios depicting intentional rather

323   than accidental harm (Decety, Michalska, & Kinzler, 2012).

324   Intent-based moral judgment continues to develop between the ages of four and eight

325   years (Cushman, Sheketoff, Wharton, & Carey, 2013). Cushman and colleagues used evidence

326   from young children to argue for a two-process model of moral judgment (see also Cushman,

327   2008, for evidence supporting a similar model in adults). In their study, children heard stories

328   concerning attempted harm (e.g., a boy tried to push over another child but tripped on a rock

329   instead) and unintentional harm (e.g., a boy tripped over a rock while running and accidentally

330   pushed someone over in the process). Participants then delivered moral judgments (e.g., "Should

331   [the character] be punished?", "Is [the character] a bad, naughty boy?"). When collapsing across

332   stories and dependent measures, the researchers found that with increasing age, children became

333   increasingly likely to condemn attempted harm despite the fact that the outcome was benign.

334   Older children were also less likely than younger children to condemn accidental harm. These

335   results show an age-related shift to greater reliance on intent rather than outcome when making

336   moral judgments of others' actions.

337   Additional effects found in this study shed light on the influence of intent-based moral

338   judgment on judgments concerning punishment (Cushman et al., 2013). Specifically, older

339   children relied more on information about intent when judging the character's **naughtiness**,

340   compared to when judging the extent to which the character should be **punished**. When

341   responding to stories involving accidental harm, intent-based naughtiness judgments mediated

342   the effect of age on intent-based punishment judgments, but the reverse was not the case.

343   Furthermore, initial intent-based naughtiness judgments led to greater subsequent intent-based

344   punishment judgments, but the reverse did not occur. These findings suggest that intent-based

345   naughtiness judgments constrained intent-based punishment judgments. Furthermore, Cushman

346   et al. (2013) use these results to argue in favor of the idea that the developmental shift from

347   outcome-based reasoning to intent-based reasoning relies on conceptual changes within the

348   moral domain rather than gains in more domain-general abilities such as executive function and

349   theory of mind.

350   Other work, however, has investigated the ways in which the development of theory of

351   mind abilities may influence the development of moral cognition and vice versa. Findings from

352   this literature, in combination with Cushman et al.'s (2013) research, suggest that changes in

353   children's moral judgments may depend both on conceptual change within the domain of

354   morality and on the development of more domain-general abilities. For example, in one study

355   (Killen, Mulvey, Richardson, Jampol, & Woodward, 2011), 3.5- to 7.5-year-old children who did

356   not exhibit full competence on a task measuring morally-relevant theory of mind (MoTOM)

357   were more likely to attribute negative intentions to a peer who accidentally harmed another than

358   did participants who answered all MoTOM questions correctly. In a follow-up study, participants

359   who did not pass the MoTOM task reported that it was more acceptable to punish the "accidental

360   transgressor" than did participants who answered all MoTOM questions correctly. These studies

361   point to a relationship between developing moral judgments and the emergence of theory of

362   mind.

363   Additional evidence suggests that moral judgments may also play a role in influencing

364   theory of mind. For example, Leslie, Knobe, and Cohen (2006) found that preschoolers were

365   more likely to say that a person intentionally caused a negative rather than a positive outcome,

366   despite the fact that both outcomes were presented as unintended. Similar results have been

367   found among adults (Knobe, 2005). The reverse is also true, as demonstrated by evidence

368   showing that moral cognition recruits brain regions that support mental state processing, such as

369   the right temporoparietal junction (RTPJ) and medial prefrontal cortex (MPFC; Kedia, Berthoz,

370   Wessa, Hilton, & Martinot, 2008; Young & Saxe, 2009). These data suggest that healthy adults

371   reason about others' mental states when delivering moral judgments. Additional neuroscience

372   evidence points to the importance of neurodevelopment for moral judgment (Decety & Howard,

373   2013). For example, in one study (Decety & Michalska, 2010), 7- to 40-year-old participants

374   viewed scenarios where individuals experienced either intentional or accidental physical harm.

375   An age-related change was observed in ventro-medial pre-frontal cortex (VMPFC) activation.

376   Whereas younger participants demonstrated activation in the medial VMPFC when exposed to

377   intentional harm, the locus of activation moved to the lateral VMPFC as participants aged. This

378   demonstrates a shift from a more visceral response (typically associated with the medial

379   VMPFC) to a more cognitive response integrating information about mental and affective states

380   (typically associated with the lateral VMPFC). Thus, neurodevelopmental changes may underlie

381   some changes in moral cognition across development.

382   **Intent-Based Moral Judgments in Adulthood.** Intent plays such an important role in

383   moral judgment that, in some cases, participants prioritize information about intent rather than

384   outcome when evaluating actions. For example, in one set of studies (Cushman, 2008), adults

385   read vignettes that manipulated the actor's desire (e.g., the actor wanted or did not want to burn

386   another person's hand), the actor's belief (e.g., the actor thought or did not think that her action

387   would burn another person's hand), and the outcome (e.g., the other person's hand was burned or

388   not burned). Adults then judged how morally wrong the actor's behavior was, how much the

389   actor was to blame for the outcome, and how much the actor should be punished. When judging

390   moral wrongness, adults prioritized information about the actor's intent. By contrast, when

391   assessing blame and punishment, adults also considered the harmfulness of the outcome.

392   Intent appears to be especially important in adults' judgments of harmful—as opposed to

393   purity-violating—actions (Young & Saxe, 2011). Young and Saxe presented participants with

394   vignettes that varied in two ways. First, some vignettes described harmful actions (e.g., one

395   person poisoned another), while others described purity-violating actions that did not cause harm

396   (e.g., two long-lost siblings had consensual sex). Second, within each condition, some vignettes

397   described actors who behaved intentionally or accidentally (e.g., the person knew or did not

398   know she was poisoning another person's food; sexual partners knew or did not know they were

399   siblings). Participants judged intentional harmful actions as well as intentional purity-violating

400   actions to be wrong, showing that adults make moral judgments even in the absence of harm.

401   Two additional results of particular relevance to the role of intent in moral judgment emerged.

402   First, participants judged harmful actions to be morally worse when committed intentionally

403   versus accidentally, showing that most adults care about an actor's intent and not just the action's

404   outcome when determining moral wrongness. Second, accidental harms were judged **less**

405   morally wrong than accidental purity violations. Adults did not rely on intent indiscriminately

406   when making moral judgments; rather, information about intent mattered more for judgments

407   concerning harm than for judgments concerning purity. These results may have occurred because

408   harmful actions usually impact a victim, while purity-violating actions do not need to impact

409   anyone other than the perpetrators (see also Chakroff, Dungan, & Young, in press).

410   In summary, moral judgment does not depend solely on harmful outcomes. Rather,

411   people demonstrate a sophisticated ability to consider actors' intentions as well as outcomes for

412   moral judgment. Additionally, individuals deliver moral judgments even in cases (e.g., purity

413   violations) where no victims appear to be harmed (see also Graham et al., 2011; Haidt, 2001,

414   2012; Koleva, Graham, Iyer, Ditto, & Haidt, 2012). As children mature, they become better able

415   to process mental state information for moral judgment.

416   **Connections between Moral Cognition and Other Domains**

417   We have already discussed work showing that young children and adults distinguish

418   moral rules from other types of norms, such as norms governing social convention. In addition to

419   distinguishing morality from social convention, children and adults also distinguish morality

420   from mere preference. Adults place morality in an intermediate position between beliefs about

421   facts on the one hand and preferences on the other; the logic is that morality is similar to

422   objective fact in some ways and similar to subjective preference in other ways (Goodwin &

423   Darley, 2008). Preschoolers also treat moral properties like "good" and "bad" as more objective

424   than properties that depend more on preference, such as "fun" and "icky" (Nichols & Folds-

425   Bennett, 2003). Of course, moral beliefs cannot be verified in the same way that facts can be

426   identified as true or false. For example, the factual statement "George Washington was the first

427   president of the United States" can be verified using the proper materials (e.g., textbooks,

428   original documents) and skills (e.g., reading). By contrast, the moral belief that "hitting is

429   wrong" cannot be verified in the same way.

430   A discussion of moral objectivity is beyond the scope of this article (for further

431   discussion, see Goodwin & Darley, 2012; Nichols, 2004; Sarkissian, Park, Tien, Wright, &

432   Knobe, 2011; Wainryb, Shaw, Langley, Cottam, & Lewis, 2004; Young & Durwin, 2013), but it

433   is important to recognize that morals beliefs are not the only beliefs that occupy this intermediate

434   space. Children between five and ten years old, as well as adults, place religious beliefs in the

435   same intermediate space (Heiphetz, Spelke, Harris, & Banaji, 2013). Adolescents and adults treat

436   political beliefs similarly, positioning them between factual and preference-based beliefs

437   (Heiphetz, Spelke, Harris, & Banaji, unpublished data). Although children and adults distinguish

438   morality from some types of beliefs, such as those concerning preference and social convention,

439   they may group morality with other ideologies, including religion and politics. These apparently

440   different domains— morality, religion, and politics—may share common psychological

441   processes. For example, all concern ideologies—shared beliefs about how the world is and,

442   importantly, how the world ought to be (Jost, Federico, & Napier, 2009). Future work should

443   investigate the cognitive signatures of ideological thought.

444   **Conclusion**

445   From infancy to adulthood, people make sophisticated moral judgments that rely on a

446   number of inputs, such as distress signals, social norms, moral rules, and information about an

447   actor's intent. First, we discussed evidence indicating that distress signals can indicate that harm

448   has occurred. Second, we presented work showing that moral judgment often occurs in the

449   absence of distress signals. Third, we presented research showing that children and adults alike

450   distinguish harmful actions from violations of social convention and that social norms as well as

451   moral rules can influence moral judgments. In addition, this body of research shows that even

452   toddlers may withhold moral judgment in the presence of distress signals if they perceive the

453   distress to occur as a result of a socially normative (rather than harmful) behavior. Fourth,

454   children and adults alike use information about others' intentions to inform their moral

455   judgments. Finally, although individuals also distinguish moral beliefs from beliefs about facts

456   and preferences, they appear to group morality with other ideologies such as political and

457   religious beliefs. Exploring further connections between moral cognition and other domains

458   remains a fruitful avenue for future research.

459

463

464   References

465   Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). Patterns of attachment: A

466   psychological study of the strange situation. – Lawrence Erlbaum, Hillsdale.

467   Baillargeon, R., Scott, R. M., & He, Z. (2010). False-belief understanding in infants. – Trends in

468   Cog. Sci. 14: 110-118.

469   Bekoff, M. (2001). Social play behaviour: Cooperation, fariness, trust, and the evolution of

470   morality. – J. of Consciousness Studies 8: 81-90.

471   Blair, R. J. R. (1995). A cognitive developmental approach to morality: Investigating the

472   psychopath. – Cognition 57: 1-29.

473   Blair, R. J. R., & Morton, J. (1995). Putting cognition into psychopathy. – Beh. and Brain Sci.

474   18: 431-437.

475   Boehm, C. (This issue). The moral consequences of social selection.

476   Blair, R. J. R., & Morton, J. (1995). Putting cognition into psychopathy. – Beh. and Brain Sci.

477   18: 431-437.

478   Call, J., Hare, B., Carpenter, M., & Tomasello, M. (2004). 'Unwilling' versus 'unable':

479   Chimpanzees' understanding of human intentional action. – Dev. Sci. 7: 488-498

480   Chakroff, A., Dungan, J., & Young, L. (In press). Harming ourselves and defiling others: What

481   determines a moral domain? – PLOS ONE.

482   Côté, S., Piff, P. K., & Willer, R. (2013). For whom do the ends justify the means? Social class

483   and utilitarian moral judgment. – J. of Pers. and Soc. Psy. 104: 490-503.

484   Cushman, F. (2008). Crime and punishment: Distinguishing the roles of causal and intentional

485   analyses in moral judgment. – Cognition 108: 353-380.

486   Cushman, F., Gray, K., Gaffey, A., & Mendes, W. B. (2012). Simulating murder: The aversion

487   to harmful action. – Emotion 12: 2-7.

488   Cushman, F., Sheketoff, R., Wharton, S., & Carey, S. (2013). The development of intent-based

489   moral judgment. – Cognition 127: 6-21.

490   Dahl, A., Schuck, R. K., & Campos, J. J. (In press). Do young toddlers act on their social

491   preferences? – Dev. Psych.

492   de Waal, F. B. M. (1993). Reconciliation among primates: A review of empirical evidence and

493   unresolved issues. – W. A. Mason & S. P. Mendoza (Eds.), Primate social conflict

494   (pp. 111-144). State University of New York Press, Albany.

495   de Waal, F. B. M. (This issue). Natural normativity: The "is" and "ought" of animal behavior.

496   de Waal, F. B. M., & Ferrari, P. F. (Eds). The primate mind: Built to connect with other minds. –

497   Harvard University Press, Cambridge.

498   Decety, J., & Howard, L. H. (2013). The role of affect in the neurodevelopment of morality. – Ch.

499   Dev. Persp. 7: 49-54.

500   Decety, J., & Michalska, K. J. (2010). Neurodevelopmental changes in the circuits underlying

501   empathy and sympathy from childhood to adulthood. – Dev. Sci. 13: 886-899.

502   Decety, J., Michalska, K. J., & Kinzler, K. D. (2012). The contribution of emotion and cognition

503   to moral sensitivity: A neurodevelopmental study. – Cer. Cor. 22: 209-220.

504   den Bak, I. M., & Ross, H. S. (1996). I'm telling! The content, context, and consequences of

505   children's tattling on their siblings. – Soc. Dev. 5: 292-309.

506   Dunfield, K. A., & Kuhlmeier, V. A. (2010). Intention-mediated selective helping in infancy. –

507   Psy. Sci. 21: 523-527.

508   Dunfield, K. A., Kuhlmeier, V. A., O'Connell, L., & Kelley, E. (2011). Examining the diversity

509   of prosocial behavior: Helping, sharing, and comforting in infancy. – Infancy 16: 227-

510   247.

511 Eibl-Eibesfeldt, I. (1970). Ethology: The biology of behavior. – Holt, Rinehart, & Winston,

512   Oxford.

513 Goodwin, G. P., & Darley, J. M. (2008). The psychology of meta-ethics: Exploring objectivism.

514   – Cognition 106: 1339-1366.

515 Goodwin, G. P., & Darley, J. M. (2012). Why are some moral beliefs perceived to be more

516   objective than others? – J. of Exp. Soc. Psy. 48: 250-256.

517 Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of

518   moral foundations. – J. of Pers. and Soc. Psy. 96: 1029-1046.

519 Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the

520   moral domain. – J. of Pers. and Soc. Psy. 101: 366-385.

521 Greene, J. D., Sommerville, R. B., Nystrom, L. E., Darley, J. M., & Cohen, J. D. (2001). An

522   fMRI investigation of emotional engagement in moral judgment. – Sci. 293: 2105-2108.

523 Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral

524   judgment. – Psy. Rev. 108: 814-834.

525 Haidt, J. (2012). The righteous mind: Why good people are divided by politics and religion. –

526   Pantheon/Random House, New York.

527 Hamlin, J. K. (In press). Failed attempts to help and harm: Intention versus outcome in preverbal

528   infants' social evaluations. – Cognition.

529 Hamlin, J. K. (2012). A developmental perspective on the moral dyad. – Psy. Inquiry 23: 166-

530   171.

531 Hamlin, J. K., & Wynn, K. (2011). Young infants prefer prosocial to antisocial others. – Cog.

532   Dev. 26: 30-39.

533   Hamlin, J. K., Wynn, K., & Bloom, P. (2007). Social evaluation in preverbal infants. – Nature

534   450: 557-559.

535   Hamlin, J. K., Wynn, K., & Bloom, P. (2010). Three-month-olds show a negativity bias in their

536   social evaluations. – Dev. Sci. 13: 923-929.

537   Heiphetz, L., Spelke, E. S., Harris, P. L., & Banaji, M. R. (2013). The development of

538   reasoning about beliefs: Fact, preference, and ideology. – J. of Exp. Soc. Psy. 49: 559-

539   565.

540   Heiphetz, L., Spelke, E. S., Harris, P. L., & Banaji, M. R. (Unpublished data). Adolescents and

541   adults distinguish political ideologies from factual and preference-based beliefs.

542   Hepach, R., Vaish, A., & Tomasello, M. (In press). Young children sympathize less in response

543   to unjustified emotional distress. – Dev. Psy.

544   Heyes, C. M. (1998). Theory of mind in nonhuman primates. – Beh. and Brain Sci. 21: 101-134.

545   Hume, D. (1739/2012). A treatise of human nature. – http://www.gutenberg.org/files/4705/4705-

546   h/4705-h.htm.

547   Ingram, G. P. D., & Bering, J. M. (2010). Children's tattling: The reporting of everyday norm

548   violations in preschool settings. – Child Dev. 81: 945-957.

549   Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions,

550   and elective affinities. – Annual Rev. of Psy. 60: 307-337.

551   Joyce, R. (This issue). The origins of moral judgment.

552   Kedia, G., Berthoz, S., Wessa, M., Hilton, D., & Martinot, J. (2008). An agent harms a victim: A

553   functional magnetic resonance imaging study on specific moral emotions. – J. of Cog.

554   Neuro. 20: 1788-1798.

555   Killen, M., & Rizzo, M. (This issue). Morality, intentionality, and intergroup attitudes.

556   Killen, M., Mulvey, K. L., Richardson, C., Jampol, N., & Woodward, A. (2011). The accidental

557   transgressor: Morally-relevant theory of mind. – Cognition 119: 197-215.

558   Knobe, J. (2005). Theory of mind and moral cognition: Exploring the connections. – Trends in

559   Cog. Sci. 9: 357-359.

560   Kohlberg, L. (1969). Stage and sequence: The cognitive developmental approach to

561   socialization. – D. A. Goslin (Ed.), Handbook of socialization theory and research (pp.

562   379). Rand McNally, Chicago.

563   Koleva, S. P., Graham, J., Iyer, R., Ditto, P. H., & Haidt, J. (2012). Tracing the threads: How

564   five moral concerns (especially Purity) help explain culture war attitudes. – J. of Res. in

565   Pers. 46: 184-194.

566   Lahat, A., Helwig, C. C., & Zelazo, P. D. (2012). Age-related changes in cognitive processing of

567   moral and social conventional violations. – Cog. Dev. 27: 181-194.

568   Leslie, A. M., Knobe, J., & Cohen, A. (2006). Acting intentionally and the side-effect effect:

569   Theory of mind and moral judgment. – Psy. Sci. 17: 421-427.

570   Leslie, A. M., Mallon, R., & DiCorcia, J. A. (2006). Transgressors, victims, and cry babies: Is

571   basic moral judgment spared in autism? – Soc. Neuro. 1: 270-283.

572   Lockhart, K. L., Abrahams, B., & Osherson, D. N. (1977). Children's understanding of

573   uniformity in the environment. – Ch. Dev. 48: 1521-1531.

574   Lorenz, K. (1966). On aggression. – Bantam Books, New York.

575   Martin, G. B., & Clark, R. D. (1982). Distress crying in neonates: Species and peer specificity. –

576   Dev. Psy. 18: 3-9.

577   Nichols, S. (2004). After objectivity: An empirical study of moral judgment. – Phil. Psy. 17: 3-

578   26.

579   Nichols, S., & Folds-Bennett, T. (2003). Are children moral objectivists? Children's judgments

580   about moral and response-dependent properties. – Cognition 90: B23-B32.

581   Nichols, S., & Mallon, R. (2006). Moral dilemmas and moral rules. – Cognition 100: 530-542.

582   Nichols, S. R., Svetlova, M., & Brownell, C. A. (2009). The role of social understanding and

583   empathic disposition in young children's responsiveness to distress in parents and peers.

584   – Cognition, Brain, Beh.: An Inter. J. 13: 449-478.

585   Nucci, L. (1981). Conceptions of personal issues: A domain distinct from moral or societal

586   concepts. – Ch. Dev. 52: 114-121.

587   Phillips, W., Barnes, J. L., Mahajan, N., Yamaguchi, M., & Santos, L. (2009). 'Unwilling' versus

588   'unable': Capuchin monkeys' (Cebus paella) understanding of human intentional action.

589   – Dev. Sci. 12: 938-945.

590   Piaget, J. (1932). The moral judgment of the child. – Harcourt, Oxford.

591   Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? – Beh. and

592   Brain Sci. 1: 515-526.

593   Quinn, W. S. (1989). Actions, intentions, and consequences: The doctrine of double effect. –

594   Phil. & Pub. Aff. 18: 334-351.

595   Rakoczy, H. (2008). Taking fiction seriously: Young children understand the normative structure

596   of joint pretense games. – Dev. Psy. 44: 1195-1201.

597   Rakoczy, H., Brosche, N., Warneken, F., & Tomasello, M. (2009). Young children's

598   understanding of the context-relativity of normative rules in conventional games. – Brit.

599   J. of Dev. Psy. 27: 445-456.

600   Rakoczy, H., Warneken, F., & Tomasello, M. (2008). The sources of normativity: Young

601   children's awareness of the normative structure of games. – Dev. Psy. 44: 875-881.

602   Romero, T., Castellanos, M. A., & de Waal, F. B. M. (2010). Consolation as possible expression

603   of sympathetic concern among chimpanzees. – PNAS 107: 12110-12115.

604   Romero, T., & de Waal, F. B. M. (2010). Chimpanzee (Pan troglodytes) consolation: Third-party

605   identity as a window on possible function. – J. of Comp. Psy. 124: 278-286.

606   Ross, H. S., & den Bak-Lammers, I. M. (1998). Consistency and change in children's tattling on

607   their siblings: Children's perspectives on the moral rules and procedures in family life. –

608   Soc. Dev. 7: 275-300.

609   Sagi, A., & Hoffman, M. L. (1976). Empathic distress in the newborn. – Dev. Psy. 12: 175-176.

610   Sarkissian, H., Park, J., Tien, D., Wright, J. C., & Knobe, J. (2011). Folk moral relativism. –

611   Mind & Lang. 26: 482-505.

612   Schmidt, M. F. H., Rakoczy, H., & Tomasello, M. (2011). Young children attribute normativity

613   to novel actions without pedagogy or normative language. – Dev. Sci. 14: 530-539.

614   Schmidt, M. F. H., Rakoczy, H., & Tomasello, M. (2012). Young children enforce social norms

615   selectively depending on the violator's group affiliation. – Cognition 124: 325-333.

616   Shallow, C., Iliev, R., & Medin, D. (2011). Trolley problems in context. – J. and Dec. Making 6:

617   593-601.

618   Sheskin, M., & Santos, L. (2012). The evolution of morality: Which aspects of human moral

619   concerns are shared with nonhuman primates? – J. Vonk & T. K. Shackelford (Eds.),

620   The Oxford handbook of comparative evolutionary psychology (pp. 434-450). Oxford

621   University Press, New York.

622   Smetana, J. G. (1981). Preschool children's conceptions of moral and social rules. – Child Dev.

623   52: 1333-1336.

624   Smetana, J. G. (2006). Social-cognitive domain theory: Consistencies and variations in children's

625   moral and social judgment. – M. Killen & J. G. Smetana (Eds.), Handbook of moral

626   development (pp. 119-153). Lawrence Erlbaum, Mahwah.

627   Smetana, J. G., Schlagman, N., & Adams, P. W. (1993). Preschool children's judgments about

628   hypothetical and actual transgressions. – Child Dev. 64: 202-214.

629   Smith, C. E., Blake, P. R., & Harris, P. L. (2013). I should but I won't: Why young children

630   endorse norms of fair sharing but do not follow them. – PLoS ONE 8: 1-11.

631   Thomson, J. J. (1976). Killing, letting die, and the trolley problem. – Monist 59: 204-217.

632   Turiel, E. (1983). The development of social knowledge: Morality and convention. – Cambridge

633   University Press, Cambridge.

634   Vaish, A., Carpenter, M., & Tomasello, M. (2009). Sympathy through affective perspective

635   taking and its relation to prosocial behavior in toddlers. – Dev. Psy. 45: 534-543.

636   Vaish, A., Carpenter, M., & Tomasello, M. (2010). Young children selectively avoid helping

637   people with harmful intentions. – Child Dev. 81: 1661-1669.

638   Vaish, A., Missana, M., & Tomasello, M. (2011). Three-year-old children intervene in third-

639   party moral transgressions. – Brit. J. of Dev. Psy. 29: 124-130.

640   Wainryb, C., Shaw, L. A., Langley, M., Cottam, K., & Lewis, R. (2004). Children's thinking

641   about diversity of belief in the early school years: Judgments of relativism, tolerance,

642   and disagreeing persons. – Child Dev. 75: 687-703.

643   Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development:

644   The truth about false belief. – Child Dev. 72: 655-684.

645   Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function

646   of wrong beliefs in young children's understanding of deception. – Cognition 13: 103-

647   128.

648   Wyman, E., Rakoczy, H., & Tomasello, M. (2009). Normatvity and context in young children's

649   pretend play. – Cog. Dev. 24: 146-155.

650   Young, L., & Durwin, A. J. (2013). Moral realism as moral motivation: The impact of meta-

651   ethics on everyday decision-making. – J. of Exp. Soc. Psy. 49: 302-306.

652   Young, L., & Saxe, R. (2009). An fMRI investigation of spontaneous mental state inference for

653   moral judgment. – J. of Cog. Neuro. 21: 1396-1405.

654   Young, L., & Saxe, R. (2011). When ignorance is no excuse: Different roles for intent across

655   moral domains. – Cognition 120: 202-214.

656   Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of

657   concern for others. – Dev. Psy. 28: 126-136.

658

659

660

661

662

663

664

665

666

667

668

669

670
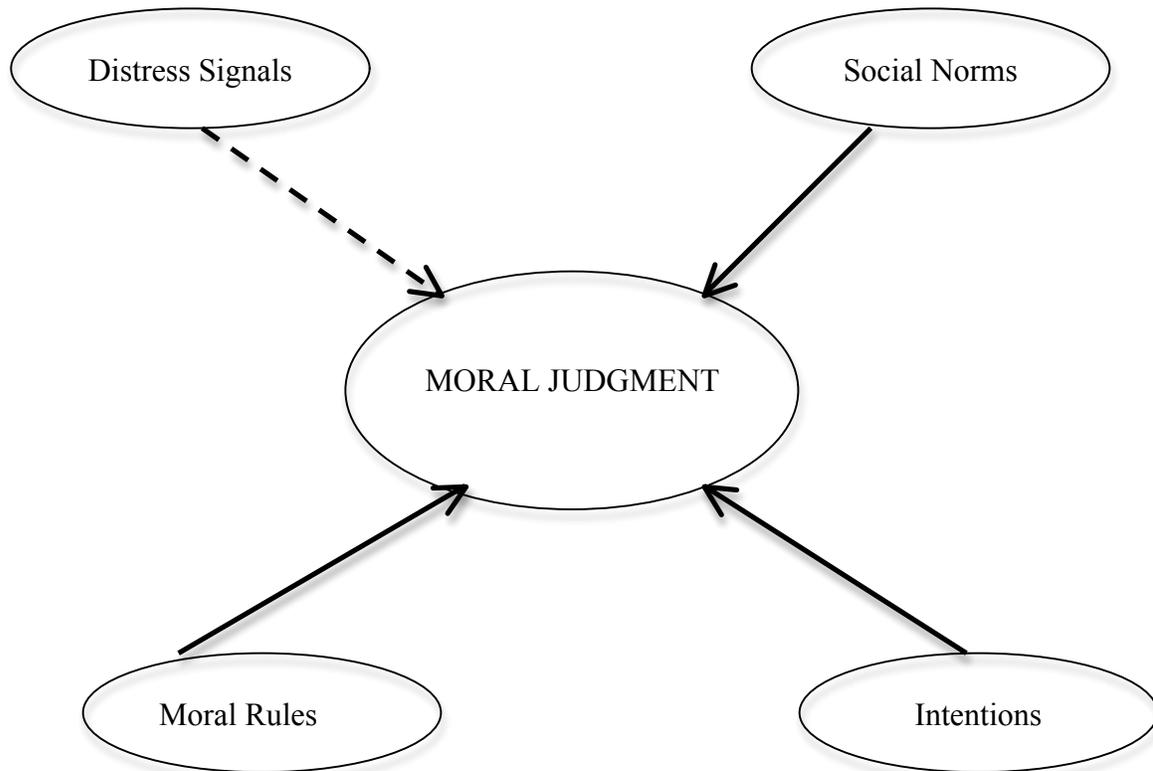
671

672

673

674   *Figure 1.* Four inputs to moral judgment. Note that though distress signals may influence moral

675   judgment, such judgment can occur even in the absence of distress signals.