When You Shouldn’t Do What You Want to Do: Young Children’s Understanding of Desires, Rules, and Emotions

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This research investigated 4- through 7-year-olds’ and adults’ (n = 64) concepts about the emotional consequences of desire fulfillment versus desire inhibition in situations where people’s desires conflict with prohibitive rules. Results revealed developmental increases in attributing positive or mixed emotions to story characters that make willpower decisions and negative or mixed emotions to characters that transgress. These developmental changes in emotion predictions were accompanied by age-related differences in emotion explanations. Whereas 4- and 5-year-olds largely explained emotions in relation to the characters’ goals, 7-year-olds and adults further explained how rules and future consequences influence emotions. Results are discussed in relation to connections among children’s psychological, deontic, and future-oriented reasoning about emotions as well as the development of self-control.

Starting around 2 to 3 years of age, young children become knowledgeable about how a person’s desires connect to his or her emotions. That is, they demonstrate consistent knowledge on experimental tasks that a person typically feels good or happy after getting what he or she wants, but feels bad or sad when his or her desire is blocked (Stein & Levine, 1989; Wellman & Banerjee, 1991; Wellman & Woolley, 1990; Yuill, 1984). Moreover, when young children are asked to talk about prototypic situations that would elicit happiness or sadness, most of these scenarios describe getting or doing what one desires as the cause of happiness, and not getting or doing what one wants as leading to sadness (Harter & Whitesell, 1989). This knowledge that emotions are connected not just to objective features of situations but to the person’s mental states in those situations is viewed as a major advancement in emotion understanding during the preschool years (see Harris, 1989; Thompson & Lagattuta, in press; Wellman & Lagattuta, 2000).

In their everyday experiences, however, children are often confronted with situations where they really want to do something but this desire conflicts with a prohibitive rule. For example, a child may really want to get out of bed and play after bedtime, but a parent tells her that she should not get out of bed. Similarly, a child may really want to run fast and get his ball, but he is cognizant of the safety rule that he should not go into the street. These experiences of wanting something in the face of prohibition—situations where one should not do what one wants to do—are arguably frequent, if not daily, occurrences in the lives of young children and humans in general. Indeed, research shows that parental socialization to rules and standards begins during the early toddler years, with safety rules (e.g., not running in the street), property issues (not touching things that belong to others), and household rules about daily living routines (e.g., not eating sweets before dinner) being common parental directives (see Dunn & Munn, 1987; Kopp, 1982; Smetana, Kochanska, & Chuang, 2000).

The current study explored children’s and adults’ beliefs about emotions in these situations where there is a conflict between a person’s desire and a prohibitive rule. Specifically, it focused on 4- to 7-year-olds’ and adults’ predictions and explanations for people’s emotions after they decide to break the rules and fulfill their desires versus after they decide...
to follow the rules and abstain from fulfilling their desires. Centrally, we were interested in if, when, and why children reject prototypic connections between desires and emotions (i.e., fulfill desire = feel good; do not fulfill desire = feel bad) and attribute negative emotions to desire-fulfilling rule breakers and positive emotions to desire-abstaining rule followers. In doing so, this research provides an important bridge between studies on children’s knowledge about psychological states, including desires and emotions, and the literatures on children’s reasoning about self-control, rules, and morality.

Prior research on children’s understanding of emotions in prohibitive rule situations has largely focused on children’s emotion attributions to story characters that break moral rules, such as stealing, lying, or causing physical harm. For example, Arsenio and Kramer (1992) presented 4-, 6-, and 8-year-olds situations where a child protagonist commits a moral transgression (e.g., steals another child’s candy, pushes another child off a swing) and asked them to predict how the victimizer would feel. Results showed that nearly all 4- and 6-year-olds and most 8-year-olds predicted that the victimizer, who gets what he or she wants, would feel happy. When asked whether or not the victimizer could be “feeling anything else,” 8-year-olds were more likely than 4- or 6-year-olds to predict an oppositely valenced emotion—that the transgressor felt both good and bad. The presence of this happy victimizer phenomenon (the attribution of positive emotions to people who achieve personal gain by harming others) in children younger than age 7 or 8 has been replicated in several related studies using similar procedures (Arsenio, 1988; Barden, Zelko, Duncan, & Masters, 1980; Keller, Gummerum, Wang, & Lindsey, 2004; Nunner-Winkler & Sodian, 1988). Moreover, some reports reveal that the tendency to assert that transgressors feel good persists into adulthood, particularly in situations where the wrongdoing goes unnoticed and unpunished (Murgatroyd & Robinson, 1993, 1997).

Researchers have commonly concluded that this developmental shift in attributing negative or mixed emotions to victimizers is caused by children’s increasing ability to integrate responses from all people involved in an act of victimization when deciding how the victimizer feels. That is, even though young children acknowledge that victims of moral crimes experience negative emotions, they have difficulty coordinating the material gain of the victimizer with the negative consequences to the victim (Arsenio & Lover, 1995; Keller et al., 2004; Nunner-Winkler & Sodian, 1988; Yuill, Perner, Pearson, Peerbhoy, & Emde, 1996). According to this interpretation, children younger than 7 to 8 years of age predict positive emotions for rule breakers because they focus solely on the outcomes of transgression from the victimizer’s perspective and see material gain as leading to happiness. Thus, for example, the child who pushes another person off the swing feels happy because he has the swing even though his classmate is crying. With increasing age, children become more capable of combining the opposing victim and victimizer emotional perspectives and, as a result, more frequently attribute negative emotions to moral rule breakers due to empathetic distress (see also Hoffman, 2000).

A broader, more integrative interpretation of children’s difficulty in attributing negative emotions to rule breakers that could apply to a wider range of prohibitive rule situations is that what changes with age may be children’s capacity to coordinate their understanding of conventional links between emotions and mental states, particularly desires (i.e., fulfill desire = feel good; do not fulfill desire = feel bad) with their increasing knowledge about obligations to comply with family and societal rules. That is, whereas attention to the status of a person’s desire fulfillment in a transgression situation leads to a prediction of happiness (i.e., because the person got what he or she wanted), a focus on rules leads to the opposite prediction of negative emotion (i.e., because of a failure to obey the rules). During the preschool and early grade school years, both children’s psychological reasoning (see Wellman, 2002; Wellman & Lagattuta, 2000) and their understanding of rule obligations develop rapidly (Harris & Nunez, 1996; Kahn, 1992; Killen & Smetana, 1999; Turiel, 2002). The challenge for children, then, is to figure out how to coordinate these psychological and deontic perspectives—to recognize how people’s goal fulfillment and their obligations to follow rules simultaneously affect emotions. Indeed, there is rising scientific interest in connections between children’s psychological reasoning and their understanding of rules and obligations (see Nunez & Harris, 1998; Peterson & Siegal, 2002; Yuill et al., 1996).

More information is needed to disentangle these different interpretations of children’s emotion reasoning in prohibitive rule situations. First, prior research on children’s emotion understanding in rule situations has been restricted to an exclusive focus on transgression. Little is known about children’s understanding of emotions resulting from the decision to exhibit willpower and effortfully abstain from engaging in a desired but prohibited act. Although the term willpower is typically applied to situations where a person intentionally forgoes his or her immediate desire in favor of a long-term goal such as
losing weight, stopping smoking, and so on (Metsalä & Mischel, 1999), it is also applicable to situations where one stops oneself from fulfilling a current desire that conflicts with established goals of being a good person, keeping oneself and others safe, promoting family relationships, and so on (Rachlin, 2000).

This lack of attention to children’s understanding about emotions resulting from acts of willpower is surprising because beliefs about the emotional consequences of breaking the rules seem even more critical than encouraging them to acknowledge feelings of remorse, shame, or guilt after committing the crime (i.e., logically one would feel the child would not commit the “crime” in the first place). To our knowledge, only one published study has addressed children’s understanding of emotions following willpower. Nunner-Winkler and Sodian (1998) presented young children with a single hypothetical vignette featuring a child protagonist who wants to steal his classmate’s chestnuts, goes and touches the chestnuts, and then decides not to steal them. Results showed that most 4- and 6-year-olds, versus 41% of 8-year-olds, predicted that the story protagonist would feel bad after following the rules. Still, this story was confusing because neither the character’s desire nor the rule was explicitly mentioned, and it appeared that the story character was initially going to steal and then changed his mind. Therefore, it remains unclear whether children’s understanding that rule compliance can elicit positive emotions develops earlier, at the same time, or later than their knowledge that people can feel bad after transgressing. Thus, the current study directly compared children’s and adults’ reasoning about emotions in willpower versus transgression situations.

Second, although previous studies reported that preschoolers more often predict positive emotions for transgressors than do older children and adults, this does not mean that young children fail to give consequences or rules any consideration. Prior research has compared young children’s emotion attributions for rule breakers only with a theoretical ideal or supposed adult belief that one should feel bad in these kinds of situations. Arguably, it is necessary to compare children’s emotion predictions for transgressors and rule abiders with appropriate empirical baselines—the emotions they predict for people that simply get what they want without having to break rules (for transgressors) and the emotions they attribute to those who simply have their desires blocked (for abiders). Therefore, the current study explored potential differences between children’s and adults’ emotion predictions and compared how children reason about emotions in situations where people’s desires conflict with prohibitive rules (desire–rule conflict situations) versus rule-free situations where people either fulfill or do not fulfill their goals (simple desire situations).

Third, beyond simply using children’s emotion attributions to measure their reasoning, more effort needs to be directed to examining how participants explain the causes of emotions in prohibitive rule situations. Detailed analysis of emotion explanations can yield informative clues about developmental changes in the factors participants of different ages consider when determining how a person will feel. Although some previous studies have had children justify their emotion predictions, these responses have been typically categorized into global dimensions of moral versus nonmoral. To gain more detailed insight into the specific dimensions children are focusing on when making emotion predictions, the current study explored developmental changes in the frequency with which 4-, 5-, 7-year-olds, and adults explain emotions in relation to character’s goals, to rules, or to future consequences. Moreover, to assess connections between children’s psychological and rule-oriented reasoning, participants’ emotion explanations were analyzed for specific references to characters’ mental states (e.g., desire to do an activity, knowledge about the rules, thoughts about future consequences).

Still, probing and analyzing explanations for emotions that participants themselves predict for story characters has limits. Age differences in explanation types may largely result from differences in the rate at which children and adults predict that characters are feeling good or feeling bad in the first place. Because one goal of the current study was to assess children’s knowledge about why people could feel good exhibiting willpower (and thus not getting what they want) and feel bad after transgressing (and thus getting what they want), for some scenarios, we directly confronted participants with characters displaying these desire–emotion mismatches and asked them to explain the cause. We reasoned that young children would demonstrate a more mature understanding about the influence of rules and future consequences on emotions when explaining emotions that are unexpected, or mismatch the status of goal fulfillment, than when ex-
explaining the causes of their own emotion predictions. This method of requiring children to explain atypical or mismatched emotions has been effectively used in previous studies to reveal surprisingly sophisticated emotion reasoning in preschoolers (see Lagattuta & Wellman, 2001; Lagattuta, Wellman, & Flavell, 1997). Correlations between emotion predictions (desire–emotion match vs. mismatch) and explanations (goal vs. rule vs. future oriented) were also measured for the prediction data alone to verify that there are conceptual links between how children explain emotions and the kinds of emotions they predict.

Finally, prior research on children’s understanding of emotions in rule situations has been unsystematic in how rule information is presented. Many studies never explicitly stated the prohibitive rule because either they assumed that children were aware that the rule exists or they were testing whether children could recognize a rule violation. When reasoning about the emotional consequences of willpower or transgression decisions, however, the source of the rule may be important. One of the central findings from Kochanska and colleagues (see Kochanska, 2002; Kochanska, Coy, & Murray, 2001) is that children who have internalized the rules—or exhibit committed versus situational compliance—are more likely to exhibit moral or compliant behavior even in the absence of adult supervision. This higher rate of compliance for internalized rules may not only result from children’s agreement with or understanding of the rule, but also from a belief that adhering to internally recalled prohibitions is more emotionally satisfying than complying with direct parental orders. In the current study, this issue was explored by varying whether the child protagonist is alone and thinks of the rule himself or herself versus whether the rule is externally ordered by a parent at the scene.

In summary, the current research examined children’s and adults’ beliefs about connections between desire fulfillment and emotions in prohibitive rule situations. Four- to 7-year-olds were targeted for this study because children’s understanding of mental states, rules, and emotions grows rapidly during this period. In addition to investigating knowledge about the emotional consequences of transgressing to fulfill one’s desires, we also assessed developmental changes in knowledge about feelings resulting from willpower decisions, or forgoing one’s desires to abide by rules. Prohibitive rules were either recalled internally by the story character or directed externally by that character’s parent. Children’s emotion predictions and explanations in prohibitive rule situations were compared with adult responses and with a baseline measure of their reasoning about the emotional consequences of desire fulfillment or blockage in simple, rule-free situations. For some story trials, children and adults explain the causes of emotions that they predict (the predict-and-explain trials), whereas for other story trials, they provided explanations for why people feel good after willpower decisions and feel bad after transgressing (the explanation-only trials). All explanations were analyzed for references to character’s goals, rules, or future consequences, as well as for explicit references to internal mental states. As well, connections between emotion predictions and emotion explanations were assessed.

Method

Participants

Participants were 64 children and adults from four age groups: sixteen 4-year-olds (M = 4 years 6 months, range = 4 years 1 month to 4 years 11 months), sixteen 5- to 6-year-olds (M = 5 years 11 months, range = 5 years 1 month to 6 years 11 months), sixteen 7- to 8-year-olds (M = 7 years 10 months, range = 7 years 0 months to 8 years 11 months), and 16 adults (M = 19 years 9 months, range = 18 years 6 months to 23 years 6 months). All age groups were composed of equal numbers of males and females. Children were recruited from several preschools and grammar schools serving ethnically diverse populations of largely middle-class families (71% Caucasian, 15% Asian American, 14% other ethnicities). Adults were undergraduates at a northern California university (63% Caucasian, 25% Asian American, 12% other ethnicities).

Materials and Procedures

There were two types of story scenarios: simple-desire stories (see Figure 1 for an example) and desire–rule conflict stories (see Figure 2 for an example). All stories consisted of a series of simple colorful illustrations on 5 × 5 in. laminated cards.

Simple-desire stories. Simple-desire stories each featured a character that wants to do a particular action and there is no prohibitive rule. There were two possible endings: (a) goal-blocked endings (the character does not get what he or she wants) or (b) goal-fulfilled endings (the character gets what he or she wants). As shown in Figure 1, Emma really wants to go into a toy store and play with some toys. She either walks up to the store and (a) sees that the...
store is closed (goal blocked), or (b) plays with some toys (goal). Note that, aside from the first story card, no emotional information is expressed pictorially on the character’s face. The other simple-desire story featured a boy who really wants to eat a grape popsicle. He opens the box of grape popsicles and either (a) sees that the box is empty, or (b) eats a popsicle.

Desire–rule conflict stories. Desire–rule conflict stories examined children’s and adults’ reasoning about connections between desires and emotions in situations where people should not do what they want to do. Stories featured characters that want to do a particular action, but this desired behavior conflicts with a prohibitive rule. Rules covered a wide range of child-familiar prohibitions including:

Figure 1. Example of illustrations for a simple-desire story shown in reduced form.

Figure 2. Example of illustrations for a desire–rule conflict predict-and-explain story shown in reduced form.
(a) safety or prudential rules (you should not climb very high up a tree, run fast into the street, pick up little babies, or touch wild animals), (b) rules about living routines involving health or nutrition (you should not eat cookies right before dinner or get up and play after bedtime), and (c) rules about privacy and ownership (you should not touch dad’s computer or try on mom’s gold necklace). Four of the stories featured a boy as the central character and four stories featured a girl. For all scenarios, the actual consequences of the character’s behavior was purposely excluded so that participants’ emotion predictions or explanations would be based on the character’s act of complying versus violating rules rather than on given information about events that resulted from this decision.

Desire–rule conflict stories varied on two dimensions: (a) the source of the prohibitive rule (internal vs. external rule source) and (b) the character’s ending action (willpower vs. transgression). Figure 2 shows these variations for “Ben’s story.” For the internal rule source version, Ben is alone and thinks of the rule himself (e.g., “One day Ben is kicking a ball outside all by himself. The ball rolls into the middle of the street. Right now, Ben really wants to run fast into the street to get his ball, but . . . Ben thinks, ‘I should NOT run out into the street’”). In contrast, in the external rule source version, Ben’s mother tells him the prohibitive rule (e.g., “One day Ben is kicking a ball outside with his mom. The ball rolls into the middle of the street. Right now, Ben really wants to run fast into the street to get his ball, but . . . Ben’s mom says, ‘You should NOT run out into the street’”). For the willpower endings, the protagonist abstains from doing what he or she wants (e.g., “Well, let’s see what Ben decides. Ben stays out of the street”), whereas for the transgression endings, the character decides to fulfill the prohibited desire (e.g., “Well, let’s see what Ben decides. Ben runs into the street and gets his ball”). For all willpower endings, the characters pose with their arms behind their backs, with hands extending away from the desired object, to indicate that their act of compliance was final.

Here, it is important to clarify four features of the desire–rule conflict stories. First, despite variations in specific rule content, all stories explicitly mention the characters’ desire (e.g., “Ben really wants . . .”) and explicitly state what he or she should not do (“I/you should not run into the street”). Second, as with the simple-desire stories, no emotion is pictured on the characters’ faces when the desire, rule, or the final behavior is described (characters were either shown from the side, behind, or with their mouths occluded). Third, regardless of the rule source, the final willpower or transgression story card featured only the protagonist, making it ambiguous as to whether an authority figure witnessed the behavior. Finally, transgression endings did not portray any negative outcome for the protagonist (e.g., Ben is just out in the street—we do not know if he will get in trouble, get hurt, etc.). Similarly, willpower endings did not show any positive outcomes (e.g., Ben is just standing with his arms behind his back).

Questioning Procedures

Control questions (simple-desire and desire–rule conflict stories). For all simple-desire and desire–rule conflict story trials, participants were explicitly told the character’s desire (e.g., “Right now, Emma really wants to play with some toys”; “Right now, Ben really wants to run fast into the street and get his ball”). To verify that participants encoded this mental information, the desire control question was asked before revealing the ending of the story (“Right now, what does [character] really want to do?”). Desire–rule conflict stories further included a rule control question (“Right now, what rule does [Ben] think about?” or “Right now, what rule does [Ben’s mom] say?”). Participants responded to the rule control question first for half of the trials and to the desire control question first for the other half of the trials (the order of the rule vs. desire control question was randomized across story trials).

Test questions for prediction trials (simple-desire and desire–rule conflict stories). At the conclusion of the story (e.g., after Emma sees that the store is closed; after Ben decides to stay out of the street), the experimenter asked the primary emotion probe: “Do you think [character] is feeling good or bad right now?” Next, participants were shown a 4-point pictorial emotion intensity scale ranging from 1 (very bad) to 4 (very good) and they were asked the emotion intensity question: “Does [character] feel very good, or just a little bit good (or does she feel very bad, or a just a little bit bad)?” After judging the emotion intensity, participants were asked the emotion explanation question: “Why does [character] feel [very bad, a little bit bad, a little bit good, very good] right now?” Finally, to allow participants to offer more than one emotion prediction, the experimenter asked the secondary emotion probe: “Could [character] be feeling another way here too, or is she just feeling [the participant’s response to the primary emotion probe]?” If participants provided an additional emotion prediction, they were asked to explain the cause of the secondary emotion as well.
Test questions for explanation-only trials (desire–rule conflict stories only). For the last four out of eight desire–rule conflict story trials, participants were told and shown the character’s emotional reaction. For these explanation-only trials, the experimenter asked the participant only the emotion explanation question: “Why does [character] feel bad/good right now?”

Figure 3 shows the explanation-only versions of the Ben story. As illustrated in Figure 3, the emotional response of the story character always mismatched the emotion that would be predicted by focusing on desire fulfillment (or lack of fulfillment). That is, when the story character exhibited willpower and abstained from doing what he or she wanted, he or she felt good. When the story character transgressed and fulfilled his or her desire, he or she felt bad. As described in the Introduction, these explanation-only trials were included to assess children’s ability to explain the causes of desire–emotion mismatches (i.e., feeling bad after goal fulfillment, feeling good after goal blockage)—emotions they may not spontaneously predict.

General Procedures

Participants were interviewed individually in a quiet room by a female experimenter. At the start of the session, the experimenter introduced children to the 4-point emotion intensity scale and labeled each emotion for them. She then asked the child to point to each of the emotions in random order (e.g., “Point to where the person feels a little bad”). After identifying each emotion expression correctly, the test trials began (all children easily passed this task). The experimenter presented story cards individually as she read aloud the content. Interviews were tape-recorded and transcribed verbatim. The procedure lasted 15 to 20 min.

Each participant received a total of 10 story trials: 2 simple desire prediction trials (1 goal fulfilled, 1 goal blocked), 4 desire–rule conflict prediction trials (2 willpower: 1 internal rule source, 1 external rule source; 2 transgression: 1 internal rule source, 1 external rule source), and 4 desire–rule conflict explanation trials (2 willpower: 1 internal rule source, 1 external rule source; 2 transgression: 1 internal rule source, 1 external rule source). Simple-desire stories were always presented for the first 2 trials, Trials 3 through 6 were the desire–rule conflict predict-and-explain trials, and Trials 7 through 10 were the desire–rule conflict explanation-only trials. Explanation-only trials came last to prevent prompting children to provide desire–emotion mismatch predictions in the predict-and-explain trials.

Several measures were taken to control for order effects in this repeated measures design (see Maxwell & Delaney, 2002). First, half of the participants in each age group received the goal-blocked simple-desire ending first and the goal-fulfilled ending second, and the other half of participants received the opposite order. The desire–rule conflict scenarios were arranged so that across participants in every age group: (a) each rule source and ending action variation (e.g., internal rule, willpower ending) appeared equally in each order position, (b) each story (e.g., Ben story) appeared equally in each order.

Figure 3. Example of illustrations for a desire–rule conflict explanation-only story shown in reduced form.
position, and (c) each story plus ending combination (e.g., Ben story, external rule, transgression) was presented equally. Sixteen unique order combinations were created following these criteria, with one version randomly assigned to each participant in each age group.

Coding of Explanations

Emotion explanations for all story types were classified into four categories using verbatim transcripts of the research sessions: (a) goal oriented, (b) rule oriented, (c) future oriented, and (d) other.

Goal-oriented explanations attributed the character’s emotion to whether the person did or did not fulfill his or her goal (e.g., “Because he stayed out of the tree and didn’t get the ball”; “Because he wanted to get his ball and he did it”). Although goal-oriented explanations were not required to include an explicit volition term, such as want, they did have to include a specific reference to the goal stated by the story character (e.g., for Ben’s story, the participant had to say something about the goal of getting the ball from the street).

Rule-oriented explanations justified the character’s emotion as caused by whether the character followed or broke the rules (e.g., “Because he listened to the rule”; “Because she broke her mom’s rule”), or as caused by a character’s obligation to follow the rules (e.g., “Because his mom said he had to stay out of the street”). Rule-oriented explanations were required to include an explicit deontic term or phrase, such as rule, listen, obey, should/hast to, supposed to, allowed, can, permission, right thing/wrong thing, or being good/being bad/being naughty.

Future-oriented explanations explained emotions as caused by a future negative or positive event that might or will happen (e.g., “Because he might get hit by a car since he’s in the road now”; “Because her mom will be happy that she didn’t touch her necklace”), or by the fact that the character had avoided a potential negative future consequence (e.g., “Because she might have gotten hurt if she had done it”). These future-oriented explanations were further classified as hypothetical (explaining an emotion as caused by what might happen, could happen, or could have happened) versus nonhypotheical (explaining an emotion as caused by what will happen). Moreover, they were also assessed for references to future punishment (i.e., being witnessed, punished, or making another person mad).

The other explanation category was reserved for any explanation that did not refer to the specified goal, the rules, or future consequences, for example, an emotion caused by a current event (e.g., “She feels bad because the bird bit her”).

The coding system allowed for multiple coding of an emotion explanation. For example, “She feels happy because she followed the rules and because she won’t get in trouble later” was coded both as rule oriented and as future oriented.

In addition to coding explanation type, all explanations were coded for explicit use of mental state language. Following previous research on children’s mental state language (see Bartsch & Wellman, 1995; Lagattuta & Wellman, 2002) mental language included volition terms (e.g., desire, want, need, hope, wish, intend), cognitive terms (e.g., think, know, remember, believe, decide, realize, discover), and references to emotional states besides repeating back “feel good” or “feel bad” (e.g., proud, guilty, ashamed, mad). Phrases used to indicate a mental state were included (e.g., “tried hard to resist,” “made a good choice,” “not her fault/ her fault”); however, physiological terms (e.g., pain, thirsty, tired) and perception terms (e.g., see, hear) were excluded. Note that to be counted as a mental explanation the participant had to attribute the mental state to the character, not just use a mental state term in his or her explanation. For example, “I think he feels bad because he didn’t get his ball” would not be counted because the participant is attributing the mental state to herself. An example of an acceptable mentalistic explanation is, “He feels bad because he thinks he’ll never get his ball.”

Two undergraduate research assistants were trained how to code explanations by the primary investigator. For this training, 25% of transcripts were collaboratively analyzed (4 participants at each age group for a total of 16 participants). The two research assistants then independently coded the remaining 75% of transcripts (12 participants × 4 age groups × 10 trials per participant = 480 story trials). The pooled values of kappa .94 for explanation type and .97 for use of mental language. Within future-oriented explanations, the pooled values of kappa were .95 for hypothetical and .99 for punishment. All discrepancies were resolved by discussion.

Results

Results are divided into three sections. Initial prediction analyses focus on children’s and adults’ predictions for story character’s emotions in simple-desire and desire—rule conflict scenarios. Explanation analyses examine how participants explained the cause or causes of these emotions. These approaches are combined in the final section by examining the relationship between participants’
Prediction Analyses

Simple-desire stories. All age groups demonstrated knowledge about connections between desires and emotions in rule-free situations. Ninety-four percent of 4-year-olds’ responses and 100% of 5-year-olds’, 7-year-olds’, and adults’ responses to the primary emotion probe predicted that a person would feel good getting what he or she wanted. As well, 100% of participants’ responses predicted that a person would feel bad when his or her goal was blocked. All age groups rarely offered mixed-emotion responses in response to the primary or secondary emotion probe for the simple-desire stories (M = 9% of 4-year-olds’ predictions, 0% of 5-year-olds’ predictions, 15% of 7-year-olds’ predictions, and 9% of adults’ predictions).

These data provide an important baseline for evaluating children’s and adults’ predictions for the desire–rule conflict situations. First, they reveal no age differences in reasoning about simple connections between desires and emotions. Children and adults nearly always predicted that a person’s emotion would match the status of the goal fulfillment: When a person fulfills a goal he or she feels good, and when a person’s goal is blocked he or she feels bad. Moreover, the data strongly suggest that participants did not interpret the secondary emotion probe (i.e., asking whether the character could be feeling another way too) as an indication that their first prediction was incorrect. That is, the secondary emotion probe did not lead children any more than adults to provide an additional, opposite-valenced emotion prediction.

Desire–rule conflict stories. Analyses of emotion predictions in situations where a person’s desire conflicted with a prohibitive rule revealed several significant developmental differences. Here the focus is on: (a) the percentage of story trials for which participants provided desire–emotion mismatch predictions as their primary emotion prediction (i.e., they predicted that the character in a willpower situation would feel good and that the character in a transgression situation would feel bad), (b) the percentage of story trials for which participants predicted desire–emotion mismatches in response to either the primary or secondary emotion probe (i.e., whether participants ever predicted positive emotions for willpower and negative emotions for transgression), and (c) the percentage of trials for which participants predicted that the character would experience mixed emotions (i.e., feel good and bad at the same time). For these dependent variables, participants were given a score of 1 for every story trial for which they provided that kind of response (e.g., a mixed emotion prediction) and a score of 0 if they did not. Tables 1, 2, and 3 display these data, with data for transgression trials shown at the top of each table and data for willpower trials displayed at the bottom of each table.

Preliminary analyses revealed that control question order and trial order did not significantly influence participants’ emotion predictions. Moreover, there were no significant main effects or interactions for gender. These factors are considered further.

Table 1 provides participants’ responses to the primary emotion probe. A 4 (age) × 2 (rule source: internal vs. external) × 2 (ending action: transgression vs. willpower) repeated measures analysis of variance (ANOVA) for desire–emotion mismatch predictions resulted in a main effect for rule source, $F(1, 60) = 5.12, p < .03$, qualified by a significant Rule Source × Ending Type interaction, $F(1, 60) = 7.24, p < .01$. There was no main effect for age: Children and adults predicted that rule abiders would feel good and transgressors would feel bad at equivalent rates. Although participants provided desire–emotion mismatch predictions more frequently as their first emotion prediction when story characters recalled the rules internally versus when they had them ordered by a parent (M = 38% vs. 26% primary predictions, $p < .05$), this difference was driven by the willpower trials. That is, children and adults more frequently attributed positive emotions to

Table 1

<table>
<thead>
<tr>
<th>Ending action</th>
<th>Age</th>
<th>4</th>
<th>5</th>
<th>7</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transgression “feel bad” predictions</td>
<td>Total&lt;sup&gt;a&lt;/sup&gt;</td>
<td>28</td>
<td>16</td>
<td>44</td>
<td>28</td>
</tr>
<tr>
<td>Internal rule source&lt;sup&gt;b&lt;/sup&gt;</td>
<td>25</td>
<td>13</td>
<td>50</td>
<td>25</td>
<td></td>
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<tr>
<td>External rule source&lt;sup&gt;b&lt;/sup&gt;</td>
<td>31</td>
<td>19</td>
<td>38</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Willpower “feel good” predictions</td>
<td>Total&lt;sup&gt;a&lt;/sup&gt;</td>
<td>31</td>
<td>28</td>
<td>40</td>
<td>41</td>
</tr>
<tr>
<td>Internal rule source&lt;sup&gt;b&lt;/sup&gt;</td>
<td>50</td>
<td>31</td>
<td>63</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>External rule source&lt;sup&gt;b&lt;/sup&gt;</td>
<td>13</td>
<td>25</td>
<td>19</td>
<td>38</td>
<td></td>
</tr>
</tbody>
</table>

Note. All numbers are percentages.
<sup>a</sup>Percentage of story trials out of 32 per age group.
<sup>b</sup>Percentage of story trials out of 16 per age group.
characters that abided by the rules after recalling them internally versus hearing them externally (Ms = 47% vs. 23% trials, p < .01). In contrast, rule source did not influence children’s and adults’ primary emotion predictions of feeling bad following transgression decisions (Ms = 30% vs. 28% trials).

Table 2 reveals data for children’s and adults’ responses to the primary and secondary emotion probes combined. This provides a less conservative measure than the previous primary emotion data because participants could be scored as making desire–emotion mismatch predictions as long as they did so in response to either one of the two emotion probes for that story trial. A 4 (age) \( \times \) 2 (rule source) \( \times \) 2 (ending type) repeated measures ANOVA resulted in a main effect for age, \( F(3, 60) = 9.47, p < .001 \), and a significant Rule Source \( \times \) Ending Type interaction, \( F(1, 60) = 4.33, p < .04 \). Post hoc Tukey’s honestly significant difference (HSD) comparisons revealed that 4- and 5-year-olds were significantly less likely than 7-year-olds and adults to say that people would experience both negative and positive emotions in desire–rule conflict situations (ps < .05). There was no main effect for rule source or ending type: Mixed-emotion predictions were offered equivalently regardless of whether the rule came from an internal or external source, or whether the character decided to exhibit willpower versus transgress.

### Table 2

<table>
<thead>
<tr>
<th>Ending action</th>
<th>Age</th>
<th>Transgression “feel bad” predictions</th>
<th></th>
<th>Willpower “feel good” predictions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>Adult</td>
<td>Total&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Transgression “feel bad” predictions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>44</td>
</tr>
<tr>
<td>Willpower “feel good” predictions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>41</td>
</tr>
</tbody>
</table>

Note. All numbers are percentages.
<sup>a</sup>Percentage of story trials out of 32 per age group.
<sup>b</sup>Percentage of story trials out of 16 per age group.

Finally, Table 3 shows the results for mixed emotion predictions—predicting that characters would feel good and bad at the same time. A 4 (age) \( \times \) 2 (rule source) \( \times \) 2 (ending type) repeated measures ANOVA resulted only in a main effect for age, \( F(3, 60) = 12.65, p < .001 \). Post hoc Tukey’s HSD comparisons revealed that 4- and 5-year-olds were significantly less likely than 7-year-olds and adults to say that people would experience both negative and positive emotions in desire–rule conflict situations (ps < .05). There was no main effect for rule source or ending type: Mixed-emotion predictions were offered equivalently regardless of whether the rule came from an internal or external source, or whether the character decided to exhibit willpower versus transgress.

### Table 3

<table>
<thead>
<tr>
<th>Ending action</th>
<th>Age</th>
<th>Transgression “feel good and bad” predictions</th>
<th></th>
<th>Willpower “feel good and bad” predictions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>Adult</td>
<td>Total&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Transgression “feel good and bad” predictions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Willpower “feel good and bad” predictions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

Note. All numbers are percentages.
<sup>a</sup>Percentage of story trials out of 32 per age group.
<sup>b</sup>Percentage of story trials out of 16 per age group.

Simple Desire Versus Desire–Rule Conflict

Final prediction analyses compare participants’ emotion attributions for characters in desire–rule conflict trials with their emotion attributions for people in no-rule situations. As previously reviewed, children and adults frequently predicted, in response to the primary emotion probe, that transgressors and simple goal fillers feel good. As well, children and adults commonly attributed negative emotions to people that exhibited willpower or had their goals blocked. Of interest, then, is whether despite the similarity in the valence of these primary emotion predictions, children and adults rate the intensity of these good or bad emotions differently in situations involving rules versus no rules. Differences in emotion ratings would reveal that participants are sensitive to rule information when considering how people feel.
As well, recall that an emotion explanation could be either the primary or the secondary emotion probe.

score. Explanations could be given in response to a goal explanation score, and a future consequence explanation: a goal explanation score, a rule explanation score, and future-oriented explanation scores to goals, rules, or future consequences, separately.

99.4% of explanations contained one or more references to goals, rules, or future consequences, separately.

These data are shown in Table 4. All age groups more frequently predicted that people felt very good when they fulfilled their goals in no-rule versus rule situations (Ms = 81% of goal-fulfilled trials vs. 9% of transgression trials). As well, children and adults more often described people whose goals were blocked in rule-free situations as feeling very bad than people who decided to inhibit their desires to comply with a rule (Ms = 45% of goal-blocked trials vs. 14% of willpower trials). Two separate 4 (age) × 2 (rule presence: rule vs. no rule) repeated measures ANOVAs confirmed that these differences were significant (ps < .001).

Analyses of Emotion Explanations

We now consider the content and focus of children’s and adults’ explanations for emotions. As described in the Method section, emotion explanations were classified as (a) goal oriented (e.g., “Because he got the cookie he wanted”), (b) rule oriented (e.g., “Because she listened to the rule”), (c) future oriented (e.g., “Because the baby is heavy and she might drop the baby”), and (d) other. Because 99.4% of explanations contained one or more references to goals, rules, or future consequences, separate analyses are not conducted on the category of other explanations.

Participants were given a score of 1 for every story trial for which they used each type of emotion explanation: a goal explanation score, a rule explanation score, and a future consequence explanation score. Explanations could be given in response to either the primary or the secondary emotion probe. As well, recall that an emotion explanation could be coded as being one or more types (e.g., as both a goal and rule explanation).

Analyses center first on explanations for trials where participants explained the character’s emotions that they themselves predicted. Subsequent analyses then compare children and adults’ emotion explanations for predict-and-explain trials with the emotion explanations provided for explanation-only trials, where participants were told that characters felt good after complying and felt bad after breaking rules.

Simple-desire trials. In simple rule-free situations, young children and adults nearly always explained a person’s positive or negative emotion in relation to goals. Specifically, 97% of 4-year-olds’ explanations, 100% of 5- and 7-year-olds’ explanations, and 97% of adults’ explanations for a person’s emotion after fulfilling or not fulfilling a desire were goal oriented. In contrast, all age groups rarely offered rule-oriented (M = 2% story trials) or future-oriented emotion explanations (M = 10%) in simple desire situations.

Desire–rule conflict: Predict-and-explain trials. Because all desire–rule conflict stories (parallel to the simple desire stories) explicitly mention characters’ desires, children and adults referred to characters’ goals in 85% or more of their emotion explanations (e.g., “He feels bad because he still wants to get his ball”; “She feels good because she is wearing the necklace”). These data are shown on the bottom of Table 5. Of interest, however, are developmental changes in children’s knowledge about how rules and future consequences influence emotions. Rule-oriented explanations are shown at the top, and future-oriented explanations are displayed in the middle of Table 5. Because preliminary analyses revealed no main effects of interactions for ending action (willpower vs. transgression) or for gender, these variables are not considered further.

As shown at the top of Table 5, a 4 (age) × 2 (rule source: internal vs. external) repeated measures ANOVA for rule-oriented explanations resulted only in a main effect for age, F(3, 60) = 13.02, p < .0001. Post hoc Tukey’s HSD comparisons showed that 7-year-olds and adults provided significantly more rule-oriented explanations for emotions than did 5-year-olds (ps < .05), and that adults explained emotions more frequently in relation to rules than did 4-year-olds (p < .05; all other pairwise, ns). Some examples of rule-oriented explanations include: “He feels good because he obeyed his mother”; “She feels very bad because her mom said she’s not allowed to climb the tree”; “She feels a little bad because she shouldn’t have done that.”

Table 4
Predicting “Feel Very Good” and “Feel Very Bad” Emotions in Simple-Desire Versus Desire–Rule Conflict Situations

<table>
<thead>
<tr>
<th>Category of analysis</th>
<th>Age</th>
<th>4</th>
<th>5</th>
<th>7</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desire fulfilled = “feel very good”</td>
<td>Simple-desire (no rule)</td>
<td>81</td>
<td>69</td>
<td>81</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>Transgression (rule)</td>
<td>19</td>
<td>0</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Desire blocked = “feel very bad”</td>
<td>Simple desire (no rule)</td>
<td>56</td>
<td>44</td>
<td>56</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Willpower (rule)</td>
<td>28</td>
<td>16</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Note. All numbers are percentages. Data reflect very intense emotions provided in response to the primary emotion probe.

\(a\)Percentage of story trials out of 16 trials per age group.

\(b\)Percentage of story trials out of 32 trials per age group.
The middle of Table 5 presents data for future-oriented explanations. A $4 \times 2$ (age) repeated measures ANOVA resulted in main effects for age, $F(3, 60) = 5.83$, $p < .001$, and rule source, $F(1, 60) = 11.86$, $p < .001$. Post hoc Tukey’s HSD comparisons revealed that 7-year-olds used future consequences to explain emotions significantly more often than did any other age group ($ps < .05$). Moreover, all age groups more frequently explained emotions as caused by future events or the avoidance of future events when the person was alone and thought of the rule himself or herself versus when a parent directly told the child protagonist what he or she should not do ($Ms = 25\% vs. 9\%$ trials). Examples of future-oriented explanations include: “She feels bad because she might drop the baby and the baby might need to go to the hospital”; “He feels bad because now a car might hit him since he’s in the street”; “She feels good because if she did touch the computer it could have messed up her dad’s work.”

Finally, as shown at the bottom of Table 5, a $4 \times 2$ (rule source) repeated measures ANOVA for goal-oriented explanations resulted in a main effect for rule source, $F(1, 56) = 4.72$, $p < .03$. Although all age groups referred to characters’ goals in most of their emotion explanations, such goal-oriented explanations were provided significantly more often when parents told characters what they should not do versus when the characters remembered the prohibitive rules internally ($Ms = 92\% vs. 84\%$ trials; $p < .04$).

Comparing emotion explanations: Explanation-only versus predict-and-explain trials. As described in the Introduction, we hypothesized that participants would more frequently consider the influence of rules and future consequences when asked to explain emotions that are opposite to what would be expected from the status of goal fulfillment (i.e., willpower, or not getting what one wants, caused the characters to feel good, and transgressing, or getting what one wants, caused the characters to feel bad) than when justifying their own predictions for story characters’ emotions. Therefore, we compared the frequency of rule-oriented, future-oriented, and goal-oriented explanations provided in predict-and-explain trials (regardless of emotion prediction) with the frequency of these explanation types in the explanation-only trials. These data are shown in Table 6.

Because preliminary analyses revealed no main effects or significant interactions for ending action (willpower vs. transgression), and only one significant main effect for gender, these factors are not considered further. A $4 \times 2$ (gender) repeated measures ANOVA resulted in a main effect for gender ($p < .02$), with females using future-oriented explanation more frequently than males ($Ms = 36\% vs. 26\%$ story trials). This gender difference was not

---

Table 5

<table>
<thead>
<tr>
<th>Emotion explanation type</th>
<th>Age</th>
<th>Rule source</th>
<th>External rule source</th>
</tr>
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<tbody>
<tr>
<td>Rule-oriented explanations (total)</td>
<td>4</td>
<td>39</td>
<td>34</td>
</tr>
<tr>
<td>Internal rule source</td>
<td>23</td>
<td>44</td>
<td>49</td>
</tr>
<tr>
<td>External rule source</td>
<td>61</td>
<td>34</td>
<td>28</td>
</tr>
<tr>
<td>External rule source</td>
<td>3</td>
<td>23</td>
<td>3</td>
</tr>
</tbody>
</table>

Future-oriented explanations (total)

<table>
<thead>
<tr>
<th>Emotion explanation type</th>
<th>Age</th>
<th>Rule source</th>
<th>External rule source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule-oriented explanations (total)</td>
<td>4</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Internal rule source</td>
<td>9</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>External rule source</td>
<td>37</td>
<td>9</td>
<td>3</td>
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<tr>
<td>External rule source</td>
<td>13</td>
<td>23</td>
<td>3</td>
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Goal-oriented explanations (total)

<table>
<thead>
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<th>Emotion explanation type</th>
<th>Age</th>
<th>Rule source</th>
<th>External rule source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule-oriented explanations (total)</td>
<td>4</td>
<td>86</td>
<td>91</td>
</tr>
<tr>
<td>Internal rule source</td>
<td>91</td>
<td>81</td>
<td>84</td>
</tr>
<tr>
<td>External rule source</td>
<td>84</td>
<td>91</td>
<td>85</td>
</tr>
<tr>
<td>External rule source</td>
<td>92</td>
<td>88</td>
<td>84</td>
</tr>
</tbody>
</table>

Note. All numbers are percentages. Percentages do not total 100% because participants often provided more than one kind of emotion explanation for each story trial. Data are combined across willpower and transgression trials and include explanations given in response to either the primary or secondary emotion probe. *Percentage of story trials out of 64 per age group. **Percentage of story trials out of 128 per age group.

Table 6

<table>
<thead>
<tr>
<th>Emotion explanation type</th>
<th>Age</th>
<th>Rule-oriented explanations (total)</th>
<th>Explanation-only trials</th>
<th>Predict and explain trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule-oriented explanations (total)</td>
<td>4</td>
<td>32</td>
<td>25</td>
<td>39</td>
</tr>
<tr>
<td>Explanation-only trials</td>
<td>36</td>
<td>48</td>
<td>23</td>
<td>61</td>
</tr>
<tr>
<td>Predict and explain trials</td>
<td>68</td>
<td>73</td>
<td>83</td>
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</table>

Future-oriented explanations (total)

<table>
<thead>
<tr>
<th>Emotion explanation type</th>
<th>Age</th>
<th>Rule-oriented explanations (total)</th>
<th>Explanation-only trials</th>
<th>Predict and explain trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule-oriented explanations (total)</td>
<td>4</td>
<td>21</td>
<td>31</td>
<td>11</td>
</tr>
<tr>
<td>Explanation-only trials</td>
<td>26</td>
<td>42</td>
<td>9</td>
<td>37</td>
</tr>
<tr>
<td>Predict and explain trials</td>
<td>52</td>
<td>69</td>
<td>24</td>
<td>13</td>
</tr>
</tbody>
</table>

Goal-oriented explanations (total)

<table>
<thead>
<tr>
<th>Emotion explanation type</th>
<th>Age</th>
<th>Rule-oriented explanations (total)</th>
<th>Explanation-only trials</th>
<th>Predict and explain trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule-oriented explanations (total)</td>
<td>4</td>
<td>76</td>
<td>66</td>
<td>86</td>
</tr>
<tr>
<td>Explanation-only trials</td>
<td>63</td>
<td>35</td>
<td>91</td>
<td>28</td>
</tr>
<tr>
<td>Predict and explain trials</td>
<td>54</td>
<td>24</td>
<td>84</td>
<td>92</td>
</tr>
</tbody>
</table>

Note. All numbers are percentages. Percentages across explanation types do not total 100% because participants often provided more than one kind of emotion explanation for each story trial. Data are combined across willpower and transgression trials and include explanations given in response to either the primary or secondary emotion probe. *Percentage of story trials out of 64 per age group. **Percentage of story trials out of 64 per age group.

---
significant when predict-and-explain trials were examined separately.)

First, consider rule explanations. A 4 (age) × 2 (rule source) × 2 (question type) repeated measures ANOVA resulted in a main effect for age, $F(3, 60) = 24.54, p < .0001$, and question type, $F(1, 60) = 4.14, p < .05$; both qualified by a significant Age × Question Type interaction, $F(3, 60) = 4.22, p < .01$. Post hoc Tukey’s HSD comparisons revealed that 4- and 5-year-olds provided significantly fewer rule-oriented explanations than did 7-year-olds or adults ($p < .05$; all other pairwise, ns). Question type was a significant factor only for the 5-year-olds, who provided twice as many rule-oriented explanations when they were asked to explain a desire–emotion mismatch than when asked to explain an emotion that they predicted ($p < .01$).

As displayed in the middle of Table 6, a 4 (age) × 2 (rule source) × 2 (question type) repeated measures ANOVA for future-oriented explanations revealed a main effect for age, $F(3, 60) = 9.42, p < .0001$; question type, $F(1, 60) = 47.58, p < .0001$; and rule source, $F(1, 60) = 3.87, p < .05$, and a significant Rule Source × Question Type interaction, $F(1, 60) = 5.09, p < .03$. Post hoc Tukey’s HSD comparisons showed that 7-year-olds provided future-oriented explanations significantly more often than any other age group ($p < .05$). Still, all age groups explained the emotional consequences of willpower or transgression in relation to possible future consequences significantly more often when they were confronted with a desire–emotion mismatch than when they were asked to predict and explain how a person would feel ($M_s = 44\%$ vs. $17\%$ trials). Rule source was a significant factor only for the predict-and-explain trials where children and adults provided more future-oriented explanations for internally versus externally recalled rules ($M_s = 25\%$ vs. $9\%$ trials; $p < .05$).

Recall that future-oriented explanations were further coded for use of hypothetical tense and reference to punishment (see the Method section). Nearly $90\%$ of children’s and adults’ future-oriented explanations were phrased in the hypothetical tense — emotions caused not by what will definitely happen but rather by events that only might happen ($M_s = 81\%$ of 4-year-olds’ future-oriented explanations, $100\%$ of 5-year-olds’ explanations, $90\%$ of 7-year-olds’ explanations, and $87\%$ of adults’ explanations). It total, less than one third of future-oriented explanations referred to the possibility of getting caught, being physically punished, or making an authority figure mad ($M_s = 26\%$ of 4-year-olds’ future-oriented explanations, $33\%$ of 5-year-olds’ explanations, $20\%$ of 7-year-olds’ explanations, and $33\%$ of adults’ explanations). Rather, most of these explanations focused on possible negative outcomes for the self (e.g., “He feels bad because he ate a cookie before dinner. It might get him too full to eat his good food”) or potential negative outcomes for others (e.g., “He feels bad because he could give the wild animal germs and it could die”).

Finally, the bottom of Table 6 shows data for goal-oriented explanations. A 4 (age) × 2 (rule source) × 2 (question type) repeated measures ANOVA for goal-oriented explanations revealed a main effect for age, $F(3, 56) = 4.72, p < .005$, and question type, $F(1, 56) = 146.09, p < .0001$. Post hoc Tukey’s HSD comparisons revealed that 4-year-olds explained emotions in desire–rule conflict situations as caused by character’s goals more frequently than did 7-year-olds or adults ($p < .05$; all other pairwise, ns). This age difference, however, was only significant for the explanation-only trials where 4-year-olds provided goal-oriented explanations at twice the rate of all other age groups. Such goal-oriented explanations were significantly reduced in all age groups when participants explained desire–emotion mismatches versus explained emotions that they predicted ($M_s = 38\%$ vs. $88\%$ trials).

Use of mental state language. All emotion explanations were examined for explicit references to characters’ mental states including desires, intentions, cognitions, and emotions (see the Method section). Because we were primarily interested in comparing children’s and adults’ use of mental state language when explaining emotions in willpower, transgression, and simple desire situations, data are combined across the four willpower trials, across the four transgression trials, and across the two simple-desire trials. The results are shown in Table 7. A 4 (age) × 2 (gender) × 3 (story type) repeated measures ANOVA

Table 7

<table>
<thead>
<tr>
<th>Story type</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
</tr>
<tr>
<td>Willpower</td>
<td>72</td>
</tr>
<tr>
<td>Transgression</td>
<td>45</td>
</tr>
<tr>
<td>Simple desire (no rule)</td>
<td>44</td>
</tr>
</tbody>
</table>

$^a$Percentage of story trials out of 160 per age group. Data include explanations given in response to the primary and secondary emotion probe combined.

$^b$Percentage of story trials out of 64 per age group (explanations for predict-and-explain and explanation-only trials combined).

$^c$Percentage of story trials out of 32 per age group (explanations for goal-blocked and goal-fulfilled trials combined).
for the percentage of story trials for which participants provided mentalistic emotion explanations resulted in main effects for age, \( F(3, 56) = 10.43, p < .0001 \), and type, \( F(2, 112) = 5.54, p < .005 \). Post hoc Tukey’s HSD comparisons showed that 5-year-olds used mental language in significantly fewer explanations than did all other age groups (\( ps < .05 \)) and that 7-year-olds also provided fewer mentalistic emotion explanations than did adults (\( p < .05 \); all other pairwise, \( ns \)). Post hoc comparisons further revealed that all age groups more often explained the emotional consequences of willpower in relation to people’s mental states than they did emotions in transgression or simple-desire situations (\( ps < .01 \)). Some examples of these mentalistic explanations include: “He feels good because he remembered his mom’s rule” and “She feels bad because she really wants to climb the tree and her mom doesn’t want her too.”

**Connecting Emotion Predictions With Explanations**

Finally, we examined the connection between predicting desire–emotion mismatches (i.e., willpower = feel good and transgression = feel bad) and explaining emotions in relation to rules, future consequences, or goals. Here, the data are considered at the level of the prediction–explanation pair. Each participant contributed between 4 and 8 prediction–explanation pairs (i.e., 1 to 2 per story trial depending on whether he or she attributed both a primary and secondary emotion). In total, across the four age groups there were 400 prediction–explanation pairs (81 for 4-year-olds, 88 for 5-year-olds, 119 for 7-year-olds, and 112 for adults). Percentages across explanation types do not total 100% because participants could provide more than one kind of emotion explanation for each emotion prediction. See Table 2 for age differences in the frequency of predicting desire-emotion mismatches (i.e., transgression = feel bad; willpower = feel good). Desire–emotion matches reflect the opposite pattern—predicting that the emotion will match the status of desire fulfillment (i.e., transgression = feel good; willpower = feel bad).

Table 8 displays these data. At every age group there is a clear link between emotion prediction and explanation type. Children and adults more frequently provided rule- or future-oriented emotion explanations after predicting that transgressors would feel bad or compliers would feel good than after attributing positive emotions following transgression or negative emotions following willpower decisions (\( Ms = 64\% \) vs. \( 19\% \) for rule-oriented explanations and \( 22\% \) vs. \( 4\% \) for future-oriented explanations). In contrast, as shown at the bottom of Table 8, children and adults explained emotions in relation to characters’ goals less often after making desire–emotion mismatch predictions than after making desire–emotion match predictions (\( Ms = 23\% \) vs. \( 93\% \)). These patterns were confirmed by partial correlation. Even with age partialed out, there were moderate to strong correlations between desire–emotion mismatch predictions and all three explanation types (\( r = .50 \) for rule-oriented explanations, \( r = .28 \) for future explanations, and \( r = -.75 \) for goal explanations, all \( ps < .001 \), two-tailed). Because the 400 prediction–explanation pairs were provided by 64 participants, the preferred method for conducting these analyses would have been to compute correlations that take into consideration the dependency of the data (see Singer, 1998). However, these partial correlations are included simply to confirm relationships that are obvious from descriptive data alone.

**Discussion**

A core tenet of everyday folk psychology shared by adults and young children is that people’s actions are often motivated by their desires. Moreover, the act of doing or getting what one wants generally elicits positive emotions (see D’Andrade, 1987; Wellman, 2002). Because humans live in social groups, however, their actions cannot always be self-determined. Thus, a central task of childhood, and of moral development in general, is to acquire skills to change, stop, or avoid behaviors that violate parental or societal standards, even when complying means sacrificing personal desires (Gralinski & Kopp, 1993; Kochanska, 2002). Children’s willingness to refrain from doing what they want in prohibitive rule situations is arguably grounded in their beliefs about
how people feel after obeying versus disobeying (see Kochanska, Padavich, & Koenig, 1996). Yet, understanding emotions in these “should not” situations is complicated—fulfilling the desire requires breaking a rule, and similarly, abiding by the rule requires desire inhibition. Because these situations pit individual desires against rules, they provide a revealing method for investigating children’s reasoning about how people’s internal mental states (i.e., people do what they intend or want to do) intersect with their sociomoral obligations (i.e., people do what they have to or should do). Indeed, results of the current research reveal significant developmental changes between 4 and 7 years of age in children’s reasoning about emotions following willpower and transgression decisions.

Early Insights During the Preschool Years

In baseline scenarios involving no prohibitions, all age groups connected desire fulfillment with positive emotions and desire blockage with negative emotions nearly 100% of the time. In response to the willpower and transgression situations, 4- and 5-year-olds persisted in making emotion predictions that conform to this prototypical connection between desires and emotions: They most commonly attributed positive emotions to rule breakers (they got what they wanted) and negative emotions to rule compliers (they did not get what they wanted). These findings replicate previous research that children younger than 7 or 8 years of age view rule breakers as happy (see Arsenio & Kramer, 1992; Barden et al., 1980; Keller et al., 2004; Nunner-Winkler & Sodian, 1988), as well as extend this classic finding to willpower situations by showing that young children also believe rule followers experience negative emotions.

Still, previous studies have not directly compared preschoolers’ reasoning about desire—emotion connections in prohibitive rule situations versus rule-free situations. Results of the current study reveal that this is a critical comparison. Indeed, the inclusion of the simple-desire scenarios showed that preschoolers do demonstrate sensitivity about the influence of rules on emotions. That is, 4- and 5-year-olds, as with 7-year-olds and adults, consistently predicted that people who fulfill desires in no-rule situations feel very good, whereas those who fulfill desires by breaking rules feel only a little good, if they feel good at all. As well, all age groups more frequently predicted that people who simply fail to get what they want feel very bad than people who inhibit their desires to comply with the rules. Preschoolers’ early insight that the connection between desires and emotions is modified by the presence of prohibitive rules—at least with regard to emotion intensity—is likely an important starting point in their developing understanding that the relationship between desire fulfillment and emotions can be different in prohibitive rule situations.

Young children’s differential emotion predictions for willpower scenarios featuring internal versus external rules also provide important clues about children’s early knowledge. Critically, although 4- and 5-year-olds infrequently predicted that willpower decisions would make a person feel good, they more often attributed positive emotions following rule compliance (as with 7-year-olds and adults) when the character recalled the rule internally versus when they heard it ordered externally by a parent. This pattern held for primary emotion predictions as well as for primary and secondary emotion predictions combined.

Although these rule source data come from only one prediction trial of each Rule Source × Ending Action type (see the Method section), the finding that young children perceive internally guided compliance as more emotionally satisfying than externally imposed rules supports and informs previous studies. First, these data suggest that children may understand the discounting principle (see Kelley, 1973) in relation to rule compliance several years earlier than in relation to previously studied contexts (see Miller & Aloise, 1989; Newman & Ruble, 1992). That is, 4-year-olds, as with older children and adults, may frequently attribute negative emotions to people that comply with external rules because they discount those people’s true willingness to obey (i.e., they did it because they had to). Discounting theory can also explain why rule source had no influence on emotion predictions for transgression situations. That is, because the characters transgressed, their acceptance of the rule is discounted regardless of rule source. More broadly, participants’ greater propensity to attribute positive emotions to internally versus externally directed compliance reveal that Western children as young as 4 years, just as adults from Western cultures, link positive emotions to autonomy and choice (see Markus & Kitayama, 2001; Ryan & Deci, 2000, for research with adults), even in situations where the person chooses not to fulfill his or her personal desire. Behaviorally, this appears to be true as well. Children who exhibit committed compliance express more positive affect when obeying the rules, whereas children whose obedience is more contingent on parental control display more neutral or negative feelings (Kochanska, 2002).
Finally, the current findings show that situations where young children must provide explanations for desire–emotion mismatches—why a person feels good after willpower or feels bad after transgression—may provoke preschoolers to move beyond a dominant focus on goal fulfillment when considering emotions in rule situations. That is, 4- and 5-year-olds (as with 7-year-olds and adults) provided significantly fewer goal-oriented explanations when explaining desire–emotion mismatches (the explanation-only trials) versus when explaining emotions that they, themselves, predicted (the predict-and-explain trials). Being confronted with desire–emotion mismatches especially appears to scaffold more sophisticated reasoning in 5-year-olds: The frequency of 5-year-olds’ rule-oriented emotion explanations doubled and future-oriented explanations quadrupled in the explanation-only versus the predict-and-explain trials. Four-year-olds may have benefited less than 5-year-olds from the desire–emotion mismatch trials because they are more resistant to reject prototypical connections between desires and emotions. That is, even though the frequency of 4-year-olds’ goal-oriented explanations significantly dropped in the explanation-only trials, they still explained emotions in relation to goal fulfillment for more than 60% of these trials—nearly double the rate of 5-year-olds. Indeed, 4-year-olds often forced such conventional desire-to-emotion linkages by creatively reinterpreting characters’ stated goals. Some examples include: “Ben feels good staying out of the street because he didn’t want his ball anymore” and “Adam feels bad eating the cookies because he decided (while eating them) that he doesn’t like cookies!” (see also Schult & Wellman, 1997).

The 5 to 7 Shift

The most significant developmental transition in understanding connections among desires, rules, and emotions occurred between the ages of 5 and 7. Seven-year-olds and adults attributed positive emotions to people who exhibit willpower and negative emotions to transgressors significantly more often did than 4- and 5-year-olds. These changes in emotion predictions were accompanied by significant increases in the frequency of rule- and future-oriented explanations. That is, 7-year-olds and adults were nearly twice as likely as 4- and 5-year-olds to explain emotions as caused by obeying, disobeying, or having to follow rules (e.g., “He feels very good because he listened to what his body says, what he thinks that his mom would not let him do’’; “He feels bad because he’s not allowed to eat a cookie”). Furthermore, 7-year-olds explained emotions following transgression or willpower as caused by possible or avoided future consequences 3 to 4 times the rate of 4- and 5-year-olds (e.g., “She feels bad because she thinks might break her mom’s necklace”; “He feels good because if ran into the street he could have gotten hit by a car”). Desire–emotion mismatch predictions and attention to rules and future outcomes did not just increase with age—they are conceptually linked. That is, participants of every age group overwhelmingly used rule- and future-oriented explanations rather than goals to justify positive emotions following willpower and negative emotions following transgression.

When explaining the causes of people’s emotions, 7-year-olds also more frequently referred explicitly to characters’ internal mental states than did 5-year-olds. For example, they attributed emotions to such mentalistic sources as the person’s knowledge about rules, desires for objects, or thoughts about future consequences. This increase in mentalistic explanations likely reflects growing sophistication in children’s reasoning about the mind during the early elementary school years, particularly their understanding of connections between mental states and emotions (see Wellman & Lagattuta, 2000; Thompson & Lagattuta, in press). It is curious, however, that 4-year-olds provided mentalistic explanations significantly more often than did 5-year-olds. These data need to be replicated to assess whether there is a true drop in children’s use of mental language when explaining emotions in rule situations between the ages of 4 and 5. For example, this decrease has not been shown in studies on children’s understanding of emotions caused by thinking about the past (Lagattuta & Wellman, 2001).

On one level finding a 5 to 7 shift is not new or surprising because it reflects a developmental transition that occurs over many domains of children’s cognitive and social functioning (see Sameroff & Haith, 1996). That is, generally speaking, older children are better able to integrate multiple sources of information enabling them to consider numerous causes of events or emotions (see Miller & Aloise, 1989) and acknowledge the presence of mixed emotions (e.g., Harter & Whitesell, 1989). According to Case and Okamoto (1996), children’s ability to consider multiple perspectives starts around the age of 7 to 8 years because this is when children become capable of forming conceptual structures that coordinate two or more dimensions. This is similar to Piaget’s (1952) assertion that whereas children younger than 7 or 8 years typically center on only one aspect of a situation, older children are capable
of decentration, or simultaneously taking into account multiple dimensions.

Still, the current findings should not be reduced to just another example of children’s ability to decenter or to consider multiple causes. To explain the development of children’s understanding of desire–emotion connections in rule situations it needs to be clearly specified (a) what feature young children are centering on and (b) what additional features older children consider. The current data answer these questions. Young children use a psychological framework—especially an emphasis on goals—to explain emotions in rule situations, and this core focus does not disappear with age. All age groups most frequently predict that transgressors feel good and rule abiders feel bad in response to the primary emotion probe; they provide equivalent rates of goal-oriented emotion explanations in the predict-and-explain trials, and they frequently make explicit references to characters’ internal mental states when explaining emotions. An enduring emphasis on immediate desire fulfillment is understandable. Indeed, a vast research base on time discounting has shown that children and adults so highly prefer immediate desire fulfillment that they choose lesser, immediate rewards over larger, delayed rewards (e.g., Green, Myerson, & Ostazewski, 1999). Similarly, delay of gratification studies show that desire inhibition does elicit negative emotions for children and adults even when people abstain to receive a future reward (e.g., Mischel, Cantor, & Feldman, 1996).

What changes developmentally is that this dominant focus on desire psychology widens to incorporate an emphasis on how emotions are simultaneously shaped by a social-obligatory or rule framework—that a person should, should not, or has to do. As well, an early orientation on emotions linked to the present widens to incorporate stronger consideration of how anticipated consequences for self and others also influence current emotions. Indeed, 7-year-olds and adults most commonly predict that transgressors and rule abiders feel mixed emotions, and they typically explain these ambivalent feelings as caused by competing perspectives within the same individual: desires versus rules (e.g., “He feels bad because he didn’t pet the squirrel . . . and feels good ‘cause he listened to his dad”) or present versus future (e.g., “She feels good because she climbed the tree, but she also feels bad because she might scare the birds”). Therefore, starting around age 7, children not only demonstrate knowledge of mixed emotions elicited by considering a situation from two different people’s perspectives, such as victimizer versus victim (e.g., Arsenio & Lover, 1995; Hoffman, 2000), but they also demonstrate knowledge about how internal self-focused perspective taking also produces mixed emotions.

The dramatic elevation in future-oriented explanations at age 7 is perhaps most compelling because future events are never explicitly mentioned in any of the story scenarios. Arguing against classic claims in the literature that young children often comply out of fear of definite punishment (e.g., Kohlberg, 1976; Piaget, 1965), future-oriented explanations at all ages were mostly phrased in the hypothetical tense—what might versus what will occur—and rarely referred to punishment. The development of children’s understanding about the self in relation to the future is of increasing scientific interest (see Haith, Benson, Roberts, & Penington, 1994; Moore & Lemmon, 2001). As shown in the current study, children’s reasoning about rule situations provides fruitful ground for investigating children’s knowledge about the emotional impact of a future-oriented perspective. For example, it is intriguing that although children develop a temporally extended view of self during the preschool years, in that they see the “now self” the same as the “past self” and “future self” (see Povinelli & Simon, 1998), the current data suggest that it is not until age 7 that this future self gains prominence, or increased stature, in children’s minds. That is, starting at age 7, children’s reasoning reflects greater trepidation about actions that satisfy a person’s present self but that jeopardize his or her future self (but see Lemmon & Moore, 2001 for evidence of future-oriented prudence in younger children). On a more general level, the rise in future-oriented explanations may also be linked to greater causal knowledge and the ability to consider if–then connections (see Siegler & Alibali, 2005).

Concerns and Future Issues

The rules included in this study covered several different child-familiar prohibitions that conflicted with characters’ desires (rules about personal safety, family living routines, and property issues). The parallel developmental patterns between children’s reasoning about emotions in situations featuring this diverse array of rules and results from previous studies focusing exclusively on infractions of moral rules suggests that children think about connections among desires, rules, and emotions similarly across a broad range of contexts. Still, developmental research in social domain theory (e.g., Killen & Smetana, 1999; Nucci, Killen, & Smetana, 1996) has shown that even 4-year-olds readily differentiate among issues that are under individual discretion,
issues that are moral, and issues that are social-conventional in nature. It would be important in future research to examine more systematically how different kinds of rules influence how children think about emotions in prohibitive rule situations. This may be especially intriguing for studying emotions related to willpower. For example, many rules we place on ourselves involve long-term goals for better health, improved appearance, and so on—issues that are really in the personal domain. This applies to young children as well, for example, trying hard to give up beloved pacifiers, blankets, and other comfort items for the sake of striving to be a “big kid.” It is unknown whether children believe that exerting willpower to abide by these personally imposed rules results in the same kind of emotions as complying with more group-held social-conventional or moral rules.

Second, in the current study, adults were presented with the same vignettes as child participants—stories featuring child protagonists and child-oriented themes. Although adults were given written and verbal instructions not to assume that the characters had less knowledge than they, their responses may still reflect how they think children reason in these situations. Thus, whereas poor performance in young children may indicate lack of understanding, poor performance in adults may reveal that adults believe children have an undeveloped sense of conscience. Some data that point to this interpretation is that adults provided future-oriented explanations significantly less often than did 7-year-olds. Because one would assume that adults have as developed a sense of the future self as 7-year-olds, this result may be driven by an adult belief that children are not future-oriented thinkers. Still, it is worth stressing the remarkable similarity in how adults and 7-year-olds reasoned about people’s emotions in these scenarios. Aside from the difference in future-oriented explanations, responses of adults and 7-year-olds were largely equivalent on all measures. Moreover, the current data support previous studies reporting that adults believe that transgressors who go unpunished feel happy (e.g., Murgatroyd & Robinson, 1997) and that adults view immediate desire fulfillment as central to happiness even when it means sacrificing future rewards (e.g., Green et al., 1999). Still, future research with adults using adult-relevant desires and rules would provide a more complete picture of potential developmental changes in reasoning about emotions in rule situations between childhood and early adulthood.

Finally, although results revealed several age-related differences, there was variability within each age group in children’s reasoning, including some gender differences (i.e., females provided more future-oriented emotion explanations than did males). This raises the issue about how family relationships and cultural practices contribute to children’s beliefs about the relationship between desires and rules. For example, several studies have documented significant connections between the quality of parent–child relationships, including attachment, and children’s willingness to comply with rules (see Kochanska, Aksan, & Nichols, 2003). Taking into consideration attachment status as well as other aspects of the parent–child relationship, such as the quality and quantity of conversations about rules and future possibilities, would provide a needed complement. For example, during everyday conversations some parent–child dyads may focus more than others on talking about future “what ifs,” leading to greater awareness of future-oriented emotions in those children. Beyond the family, it would be important to examine differences in cultural perspectives. For example, Western cultures typically construe rule obligations and free choice as polar opposites: You have to give up free choice to abide by the rules. Ethnographic studies, however, show that this opposition between choice and rules is not a given. In some cultures, the goal is for individuals to develop a voluntary will that leads them to choose freely to follow rules and to cooperate with others (see Mosier & Rogoff, 2003).

Conclusions

The current findings speak strongly to both the moral development and theory-of-mind literatures—research areas that can inform and strengthen each other but that have historically experienced minimal cross-communication. First, although preschoolers may view rule breakers as happy because they focus on material gain and neglect to consider the victim, this interpretation cannot adequately explain children’s responses in the current study. That is, if the victim–victimizer perspective or empathic distress (see Hoffman, 2000) is all that is developing, children in the current study should not have performed well on any of the desire–rule conflict trials. The transgression scenarios specified no negative consequences, and willpower situations, by their definition, included no victims and no material gain. Yet, between the ages of 4 and 7, children increasingly attributed positive or mixed emotions for willpower decisions and negative or mixed emotions following transgression. Indeed, analyses of emotion explanations provide rich data supporting a broader,
more integrative framework for interpreting this developmental transition—a framework applicable to a wide range of both moral and nonmoral rule situations. Foremost, they reveal that all age groups strongly endorse a psychological perspective when explaining emotions: They frequently refer to characters’ goals and make explicit references to internal mental states. The difference between preschoolers versus 7-year-olds and adults is that the older age groups combine this dominant psychological perspective with knowledge that rules influence emotions, and they coordinate understanding that current situations provoke emotions with awareness of the emotional impact of anticipated consequences. Thus, they consider not only multiple perspectives in relation to self versus other but also multiple perspectives in relation to the self alone.

By demonstrating that children bridge together a psychological perspective with a sociometric or deontic perspective on emotions starting around age 7, the current findings also inform the voluminous literature on children’s understanding of people in relation to their internal mental states (see Wellman, 2002). Between ages 4 and 7, children increasingly recognize that emotional satisfaction is shaped not only by a desire psychology but also by the rules and obligations that restrict people’s ability to choose their own behaviors. They still endorse a goal-oriented framework for understanding emotions, but they combine it with, or embed it in, a framework of rules and obligations. This coupling of perspectives may be so late coming because it strongly challenges fundamental, early-developing concepts about how desire fulfillment and emotions prototypically connect. Indeed, disengaging from a prepotent response to fulfill immediately one’s desires to appeal to extended goals of being a good person, maintaining positive relationships, protecting the welfare of others, and having a safe and healthy future is difficult and frustrating even for adults (Ainslie, 1992; Michel et al., 1996; Rachlin, 2000). Exploring methods for teaching children to focus on the importance of rules and future outcomes may yield effective techniques for increasing compliance and self-control and, perhaps even more important, for encouraging children to feel good about not doing what they really want to but should not do.

References


