

# CHAPTER 21

## Early Reasoning about Competence Is Not Irrationally Optimistic, Nor Does It Stem from Inadequate Cognitive Representations

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Young children's reasoning about competence and achievement often seems out of step with reality. For instance, after failing to solve four puzzles in a row, most 3- and 4-year-olds are nevertheless "very sure" that they will be able to solve a similar fifth puzzle (Parsons & Ruble, 1977). Along the same lines, after getting only about 15 points out of 100 on the first few rounds of a game, preschoolers generally expect that they will get more than 90 points on the next round (Stipek & Hoffman, 1980). Young children's judgments about competence are puzzling across a variety of contexts and tasks: Consider also that 5-year-olds often judge a person who breezed through a test to be *less* smart than a person who had to work really hard to get the same grade (Nicholls, 1978). Beyond these specific examples, classic work on this topic in the 1970s and 1980s identified dramatic developmental differences in reasoning about competence. Relative to older children and adults, young children were often found to display irrational-seeming judgments and inflated assessments of their abilities and chances of success.

These differences inspired a general perspective on children's early reasoning about competence that is considered largely correct

to this day. According to this canonical perspective, the differences between younger and older children's competence judgments are due to qualitative differences in the concepts with which they are operating (e.g., their concepts of ability, causation, quantity). In other words, the apparent irrationality of young children's reasoning about achievement was assumed to stem from structural flaws in their mental representations. My main goal in this chapter is to challenge this long-held assumption.

Although once it may have been reasonable to assume that development brings about dramatic, qualitative changes in children's concepts, the contemporary literature on cognitive development no longer supports such a view. In fact, as I outline later in this chapter, most of the concepts involved in reasoning about competence seem to be present in relatively mature form in children as young as age 3—and sometimes even in infants (e.g., Baillargeon, Scott, & Bian, 2016; Izard, Sann, Spelke, & Streri, 2009). Thus, we must look elsewhere—not to young children's conceptual shortcomings—to understand why their competence judgments in many laboratory tasks seem out of step with reality.

This chapter proceeds as follows. After some introductory remarks, I go on to summarize several of the major claims making up the canonical view that there are qualitative differences between younger and older children's competence-related concepts. I then present evidence that contradicts this canonical view and instead suggests continuity in the underlying concepts. Finally, I reconcile the continuity claim with the observed discontinuity in judgments: If younger and older children have access to a similar set of concepts, why does their reasoning about competence often look so different?

Throughout, I highlight the implications of this debate about discontinuity versus continuity in mental representations for children's motivation. According to the canonical view, children's conceptual shortcomings make them optimistic about their abilities, which in turn is thought to have adaptive consequences for children's motivation, allowing them to remain engaged with a task even in the face of failure (e.g., Harter, 2012; Nicholls & Miller, 1984a; Stipek, 1984). However, if young children's concepts do not actually limit them to clueless optimism, their motivation may not be as resilient to failure as previous theories have supposed. Instead, the same sorts of experiences and beliefs that demotivate older children are likely to take a toll on young children's motivation as well (e.g., Heyman, Dweck, & Cain, 1992).

Finally, I should point out that I do not attempt to be comprehensive in my review of the competing claims (discontinuity vs. continuity); the literatures relevant to these issues are vast. Thus, I discuss the evidence that I think best illustrates the two views and highlights the contrast between them. Also note that the argument I am making here is not new. Others have challenged aspects of the canonical view on similar grounds (e.g., Butler, 2005; Dweck, 1998, 1999), and much of what I say here echoes these other scholars' comments.

## INTRODUCTORY REMARKS

In this section, I provide some of the background that is needed to understand the

canonical view. While doing so, I also outline the reasons why one should be skeptical of this view.

The assumption of qualitative shifts in children's competence-related concepts is best understood in its historical context. This assumption is in line with the style of developmental theorizing that was popular when the canonical perspective emerged (in the 1970s and 1980s). Theories at the time tended to portray development as a series of step-like transitions between stages that differed dramatically in their representational capacities. In particular, Piaget's stage theory of cognitive development (e.g., Piaget, 1952; Piaget & Inhelder, 1969) was still influential—and was probably a source of inspiration—despite the fact that many of Piaget's specific claims were already beginning to be overturned (e.g., Baillargeon, Spelke, & Wasserman, 1985; McGarrigle & Donaldson, 1974). According to Piaget, before the age of 6 or 7 (i.e., during what he termed the *preoperational* stage of cognitive development), children's thinking exhibits serious structural flaws (e.g., an inability to think logically and abstractly) that impose a hard limit on how accurately they can represent reality. If this is right, then, of course, it is plausible to assume that young children's reasoning about competence is necessarily flawed as well, which provides a ready-made explanation for their puzzling behaviors in achievement contexts.

The problem, however, is that very few of Piaget's claims about the representational deficits of preoperational thought are left standing in the contemporary literature on cognitive development. In fact, most of the post-Piagetian work on cognitive development can be summarized with a simple phrase: "more capacity than meets the eye" (Gelman & Gallistel, 1986). On task after task, young children's wrong answers turned out to be less due to their cognitive ineptitude and more to our own shortsightedness as researchers. Irrational judgments that were initially taken as evidence for immature, undifferentiated concepts were later revealed to be reasonable extrapolations from children's everyday experiences—a conclusion that, as I argue later, applies to their irrational-seeming judgments about competence as well.

To understand the interpretive problems that arose with many Piagetian tasks, consider a classic test of children's understanding of number (Piaget, 1941): The experimenter lays out two rows containing the same number of coins and asks the child if these rows have the same number. (Children almost always get this question right.) The experimenter then deliberately lengthens one of the two rows by stretching the coins farther apart and asks the child, for a second time, whether the two rows have the same number of coins in them. At this point, the vast majority of preschoolers say "no," incorrectly choosing the longer row as having more coins. For Piaget, this typical mistake signaled an inability to represent number as distinct from spatial extent—the two concepts were assumed to be undifferentiated in children's minds. Others, however, pointed out a plausible alternative explanation for children's answers. In everyday conversation, adults' actions typically direct children's attention to information of relevance to the ongoing conversation (quite unlike the experimenter's lengthening of the row; e.g., McGarrigle & Donaldson, 1974). In addition, adults do not usually repeat a question unless the first answer is no longer valid (e.g., Rose & Blank, 1974). Might children's mistakes have been due to the simple fact that they did not realize that the rules of everyday conversation are suspended when talking with an experimenter? Indeed, when the conversationally odd elements are removed from the task (e.g., the row is lengthened by accident rather than on purpose), children's performance improves dramatically (McGarrigle & Donaldson, 1974; Rose & Blank, 1974)—"more capacity than meets the eye." Thus, what was initially interpreted as a representational deficit instead turned out to be a sophisticated pragmatic inference about the communicative intentions of the experimenter (see also Clark, 1987; Diesendruck, 2005; Horowitz & Frank, 2016). Countless variations of this scenario have played themselves out over the past 40 years of research in cognitive development, to the point that the influence of Piaget is nowadays felt mostly at the level of the broad questions cognitive developmentalists tend to pursue (e.g., How do children represent number? How do they understand

mental states?) and in their general approach to pursuing these questions (e.g., investigating the normative course of development), not at the level of specific claims about what young children can and cannot represent (e.g., Baillargeon et al., 2016; Spelke & Kinzler, 2007).

In contrast, Piaget-inspired claims about qualitative differences between the representational capacities of younger and older children still dominate the literature on children's reasoning about competence and achievement. Of course, in principle, it is possible that the competence domain, unlike those that have been studied by cognitive developmentalists, relies on mental representations that undergo radical transformations. More likely, however, reasoning about competence invokes the same basic representations that children use to navigate the world more generally (e.g., concepts of cause and effect, quantity, mental states, traits and dispositions) and that are now understood to be largely continuous across development (e.g., Baillargeon, 2004; Baillargeon et al., 2016; Cimpian, 2016; Schulz, 2012; Spelke & Kinzler, 2007). Most developmental changes seem to be quantitative in nature and to occur in the control processes that operate over these representations (e.g., working memory, inhibitory control, metacognitive monitoring; Carozzi, Tulsy, Kail, & Beaumont, 2013; Cowan, 2005; Kuhn, 2000; Williams, Ponesse, Schachar, Logan, & Tannock, 1999), as well as in children's knowledge about how these basic concepts are instantiated in the world. Correspondingly, as was the case with the supposed conceptual confusions of the preoperational child, the puzzling behaviors documented in the classic work on achievement may be better explained by nonconceptual factors such as young children's inexperience with laboratory testing situations, where many everyday rules no longer apply.

Thus, the central claim of this chapter is as follows: The nature of the mental representations underlying early reasoning about competence has long been mischaracterized. For the past 40 years, young children's optimistic predictions in achievement contexts have been used to argue for deficits in their mental representations. In contrast, the vast contemporary literature on cognitive

development—from which the work on competence cognitions has remained isolated—suggests far more continuity than change in the basic representations children use to understand reality. In light of this new evidence, differences in the competence-related judgments of younger and older children are more plausibly explained as reflecting a rational process of extrapolation from children's typical schooling/achievement environments, which change dramatically over the course of childhood (e.g., Butler, 2005; Eccles, Midgeley, & Adler, 1984; Rosenholtz & Simpson, 1984), than stage-like transitions in the underlying concepts. Setting aside gradual improvements in resources such as working memory and inhibitory control, younger and older children have access to largely similar ways of thinking about competence and achievement. Which one dominates their reasoning at any one point in development is a function of, among other things, the typical contexts in which they spend their time. To the extent that the ways of thinking and talking about competence that are salient in these contexts present a mismatch to the ones children are expected to adopt when talking to an experimenter, their answers will seem irrational. But being naive about the “appropriate” way to conceptualize competence in an unfamiliar context is not evidence for the absence of the relevant concepts, and is a far cry from being irrational.

Moreover, to the extent that optimism about one's abilities and future performance is a source of sustained motivation in the face of failure, showing that young children's optimism is not an unavoidable by-product of their cognitive immaturity (as I intend to do here) has clear implications for motivation science. Specifically, the present argument suggests that young children's ability to remain engaged with a task that they find difficult is far more fragile than previously assumed. This point underscores the substantial real-world implications of investigating early reasoning about achievement. Adequate theories on this topic are essential in determining how to optimize motivation and achievement in early childhood. If young children's optimism about their abilities is not due to their inescapable

cognitive shortcomings, as the canonical view assumes, we cannot take it for granted that children will remain motivated regardless of the outcome. In addition, if their optimistic outlook is in part a function of their typical achievement environments, changes in these environments could bring about systematic changes in children's attitudes toward learning as well, potentially for the worse.

Consider that, over the last decade or so, the early childhood education system in the United States has seen ever greater regimentation and emphasis on testing, and less of the self-directed activity that used to be the norm in preschools and kindergartens. For example, a recent study that compared nationally representative samples of kindergartens in 1998 and 2010 found that the percentage of teachers who thought that most children should learn how to read in kindergarten jumped from 31 to 80% in this relatively brief interval (Bassok, Latham, & Rorem, 2016). Similarly, use of textbooks, teacher-directed whole-class instruction, and standardized tests in kindergarten saw considerable increases over this period, whereas resources for child-selected and directed activities (e.g., sand and water tables, dramatic play areas) decreased by a similarly wide margin. If young children have access to multiple ways of conceptualizing competence, then a shift toward more formal, evaluative, and competitive early schooling environments might induce a corresponding activation of conceptions of ability as a stable capacity that one possesses more or less of than others—a perspective that has been shown to bring about negative self-assessments, lowered persistence, and maladaptive achievement outcomes in many older children (e.g., Dweck, 1999, 2006; Nicholls, 1990; Nicholls & Miller, 1984a). Thus, a more accurate understanding of young children's reasoning about competence is essential for predicting the effects of these secular trends in the education system, and more generally for fostering a positive, constructive attitude toward learning in early childhood.

Returning to the issue of continuity versus discontinuity in mental representations, one may wonder why theories regarding young

children's reasoning about competence (which posit discontinuities in the underlying concepts) have remained isolated from the contemporary literature on cognitive development (most of which reveals continuity instead). Part of the reason may simply be that research on early achievement cognitions slowed to a trickle after the early 1990s. This slowdown might have been caused in part by the success of the canonical view itself. Persuaded by the claim that young children's conceptual deficiencies make them irrational optimists whose motivation is invulnerable to failure (e.g., Nicholls & Miller, 1984a), many achievement researchers may have chosen to focus on older children instead, whose presumed conceptual sophistication put them at greater risk for maladaptive thoughts (e.g., low self-esteem, helplessness). Due to the scarcity of contemporary work on early reasoning about competence, I will occasionally rely on research from outside the competence domain to illustrate young children's greater-than-anticipated facility with relevant concepts. It is encouraging, however, that this line of research has recently seen something of a resurgence, with several important contributions to our understanding of early competence beliefs coming out just in the last 5 years or so (e.g., Beilock, Gunderson, Ramirez, & Levine, 2010; Cimpian, Mu, & Erickson, 2012; Gunderson et al., 2013; Haimovitz & Dweck, 2016; Pomerantz & Kempner, 2013). I highlight some of these contributions in the relevant sections below.

### **THE CANONICAL VIEW: CONCEPTUAL DISCONTINUITIES BETWEEN YOUNGER AND OLDER CHILDREN**

In what follows, I summarize three key claims concerning children's supposed conceptual shortcomings in the competence domain. It is hard to overstate the influence these claims still have on the contemporary literature investigating the development of achievement cognitions. As a simple search will reveal, most work published on this topic in recent years references at least one of them as an established fact about young children's reasoning about competence.

### **An Undifferentiated Concept of Ability**

As adults, we have multiple ways of thinking about success and failure. Sometimes we see achievement outcomes as reflecting a dynamic process (e.g., putting in effort, applying strategies); other times, we see them as reflecting a static underlying entity (e.g., capacity, talent) or a combination of the two (e.g., effort matters, but only up to the limit imposed by capacity) (Dweck, 1999, 2006; Nicholls, 1978, 1984, 1990). In contrast, a major claim of the canonical view is that young children have access to only one of these perspectives. According to Nicholls (1978; for reviews, see Nicholls, 1984, 1990; Nicholls & Miller, 1984a), young children simply cannot conceive of outcomes as being influenced by capacity. For them, effort is the only relevant causal variable. In fact, Nicholls (1978, 1990) went so far as to claim that through the age of 6, children may not even see the relationship between effort and outcome as causal. Rather, they may simply think of effort and outcome as the same thing: "Effort and outcome are not distinguished as cause and effect. . . . Ability, effort, and outcome are not distinguished as separate dimensions" (Nicholls, 1978, p. 812). According to Nicholls, even when children become able to differentiate effort as cause and outcome as effect (at around age 7), they still cannot grasp that any factors beyond effort might affect performance. The concept of capacity as a causal influence on achievement outcomes is argued not to be reliably present until children are 12 or 13 years old.

The most direct evidence for these claims came from children's reasoning about vignettes in which one student works harder than another yet performs either as well or less well (e.g., Nicholls, 1978; Nicholls & Miller, 1984b). After being presented with these vignettes, children were asked to judge, for example, which child is smarter or "how come they got the same when one worked hard and one didn't work hard" (Nicholls, 1978, p. 803). Their answers to a number of these questions were considered holistically and used to assign children to a particular stage of reasoning about ability; the first two stages (in a sequence of four) are

characterized by major conceptual shortcomings, as just described.

According to this perspective, young children's conceptual immaturity explains many of their strangely optimistic judgments in the competence domain. For instance, if children initially conflate effort and outcome (or, at best, think that effort completely determines the outcome), there is no reason *not* to be optimistic in the face of failure. Past failure is more or less meaningless—with more effort, one can always succeed in the future. Thus, the flawed conceptual framework young children use to reason about competence serves an important protective role, whereas more mature concepts automatically expose older children to maladaptive thoughts and outcomes: “Ironically, a more mature understanding of ability can have unfortunate consequences for competence motivation and, thereby, for continued intellectual development. Development has its discontents. These discontents stem [in part] from the ‘natural’ process of cognitive and affective development” (Nicholls & Miller, 1984a, p. 186).

Once children's concepts mature to the point where they can understand that performance can reflect one's capacity or talent, failure becomes more aversive. Failure (especially on tasks that others can accomplish) signals that one is somehow deficient, which in turn can undermine one's motivation to pursue the tasks in question.<sup>1</sup>

Young children's inability to understand that one's performance depends in part on one's talent or capacity, and not just on effort, was argued to contribute to another facet of their optimism as well: their curious disinterest in social comparison (i.e., figuring out how their performance stacks up against that of others). Young children's self-evaluations seem unaffected by information about others' performance: Whether their performance is better or worse than that of other children, kindergarteners and first graders remain equally optimistic about their abilities (e.g., Ruble, Boggiano, Feldman, & Loebel, 1980). This is as expected, of course, if young children cannot understand others' performance to reveal anything beyond the amount of effort expended. This limitation, along with other supposed

shortcomings of preoperational thought (e.g., centration, inability to seriate), was also invoked to explain why children in the early elementary grades are clueless about their relative standing among their peers, which they often grossly overestimate (e.g., Nicholls, 1978; Stipek, 1984).

In summary, Nicholls's view posits structural limitations on the concepts young children use to understand achievement. In turn, these limitations are used to account for the optimistic character of children's early competence-related reasoning.

### ***Overly Concrete and Positive Representations of Self***

Harter's influential theory on the development of children's representations of the self is another pillar of the canonical view (e.g., Harter, 1982; Harter & Pike, 1984; for recent reviews, see Harter, 2001, 2012). Harter argues that young children's immature mental representations impose a fundamental limit on their ability to reason about the self, with downstream consequences for their reasoning about competence as well. Below, I describe several of these hypothesized cognitive limitations and their implications for children's thinking about achievement, as well as their motivation.

First, Harter (2012) argues that young children are unable to conceive of themselves as possessing general capacities or traits. Instead, young children “can only construct very concrete cognitive representations of observable behaviors or features of the self (e.g., ‘I'm a boy,’ ‘I have a television in my room,’ ‘I have a kitty that is orange’)” (p. 30). Because children cannot abstract any broader commonalities across such concrete features, their self-representations are “isolated from one another,” “compartmentalized,” “disjointed,” and lacking in coherence (p. 30). Even when children mention abstract-sounding trait terms in their self-descriptions (e.g., “I'm smart”), these should not be taken at face value, since their semantic content may not be the same as for older children and adults:

Although children may describe themselves in such terminology as good or bad, nice or

mean, smart or dumb, these characteristics do not represent “traits,” given their typical psychological meanings. . . . At this age, the use of such terms are more likely to reflect the use of self-labels that have been modeled by others (e.g., parents or teachers). (Harter, 2012, p. 52)

In other words, whenever trait terms appear in young children’s self-descriptions, it is likely that children are simply mimicking adults’ use of trait terms (e.g., mom saying they are smart), without truly understanding their meaning.<sup>2</sup> This claim was consistent with several prominent studies from the same period (e.g., Rholes & Ruble, 1984; Rotenberg, 1980), which appeared to show that children are unable to interpret others’ behaviors in terms of general dispositions (traits, capacities, etc.) until they are 9 or 10 years of age (for a review, see Rholes, Newman, & Ruble, 1990).

So far, I have described the claim that young children’s concrete thinking prevents them from forming more sophisticated types of self-representations (e.g., traits, abilities). Several other cognitive deficits are invoked to account for the irrational-seeming positivity of young children’s self-representations. For instance, young children are claimed to be unable to compare abstract quantities, such as their performance versus another’s (Harter, 2012), which means that they cannot use social comparison to bring their self-evaluations to more realistic levels. Following Piaget (1960), Harter (2012) also argues that young children are egocentric—that is, unable to understand other people’s perspectives, and mental states more generally. Because of this perspective-taking failure, young children do not understand that others can be critical of them and therefore fail to incorporate this information into their self-views. Another representational deficit that was thought to exacerbate the positivity of young children’s self-views is their “difficulty distinguishing between their desired and their actual competence” (p. 31). That is, young children have overly positive self-views in part because they confuse *wanting* to be good at many things with *actually* being good at these things (see the next section for an elaboration of this claim).

In summary, Harter’s theory accounts for the quirks in children’s early reasoning about competence by appealing to a number of fundamental deficits in their concepts. As was the case with Nicholls (e.g., 1978, 1990), these cognitive limitations were also thought to serve important protective functions for their motivation, enabling young children to remain resilient in the face of daunting challenges.

### ***Wishful Thinking***

A narrower, but nevertheless influential, element of the canonical view proposes that young children’s positivity is due to a single conceptual confusion. Prompted by the observation that children are often more realistic and accurate when they’re reasoning about others’ competence rather than their own, Stipek (1984; Stipek, Roberts, & Sanborn, 1984) hypothesized that the source of their optimism lies in an immature, egocentric understanding of physical causality (Piaget, 1930). Having frequently experienced the contiguity between their desires (e.g., “I want food”) and events in the world (e.g., “I am fed”), young children may develop an exaggerated sense of personal efficacy, believing that their desires have a *direct* causal effect on the world. Perhaps, then, this “wishful thinking” tendency explains why children display inflated expectations of success.

As just mentioned, this claim is supported by self–other asymmetries in competence judgments. When it comes to predicting their own future performance, preschoolers typically expect to do well, regardless of how they did in the past; in contrast, when making predictions about how another person will do, young children reason much like older children and adults, lowering their expectations if the person has failed in the past (e.g., Stipek & Hoffman, 1980). A similar conclusion applies to how young children *evaluate* themselves compared to others: Although kindergartners and first graders overestimate their own standing among their peers, they are as accurate as older children when estimating where others rank in terms of their smarts (Stipek, 1981). In addition, their estimations of others’ (but

not their own) rank are in agreement with more objective standards, such as teacher ratings. Also consistent with claims of wishful thinking, young children are overoptimistic about another person's future performance when they stand to benefit from this person's success: When 4-year-olds were told that they would receive a bag of marbles if another child did well, the children's expectations for the other child were as inflated as when they predicted their own future performance (Stipek et al., 1984). The influence of self-interest on young children's expectations, whether for their own or for others' performance, seems to support the "wishful thinking" claim that they possess an immature concept of causality (i.e., that they believe their wishes have a direct causal effect on the world).

### **Interim Summary**

Although they differ in their details, the previous views are all instantiations of the same claim—namely, that younger and older children operate with fundamentally different sets of concepts, which is why their competence judgments are so different. This discontinuity claim is assumed to be true in most contemporary research on children's motivation and achievement. There are, however, valid reasons to be skeptical of it.

## **THE CASE AGAINST DEVELOPMENTAL DISCONTINUITIES**

This section contains two arguments against the canonical (discontinuity) view. First, I argue that the developmental differences in competence judgments—which the canonical view seeks to explain—are not nearly as stark as one would expect if they were due to the fundamental, inescapable limitations of young children's concepts. Looking at the sum of the evidence, one finds no real discontinuity in competence judgments. In fact, there are many circumstances in which younger children's reasoning is identical to that of older children. And without a sharp discontinuity in judgments, there is little reason to posit a sharp discontinuity in the concepts underlying these judgments.

Thus, the first argument questions the very existence of the phenomenon that inspired the canonical view. Second, I argue directly against the claim that the concepts underlying reasoning about competence undergo qualitative shifts. Although this claim was at one point in agreement with the state of the art in cognitive development, it no longer is. With increasing use of methodologies that are less taxing on young children's attention, memory, and language, research in this area has shown early concepts to be remarkably sophisticated. This evidence undermines any strong claims of qualitative changes in the mental representations that younger and older children use to understand the world.

### ***Is There a Sharp Discontinuity in Competence Judgments?***

If young children are truly incapable of grasping reality in the same way as older children and adults, their judgments about competence should be consistently off-target. To the extent that young children's judgments look rational in some contexts or tasks and irrational in others, it becomes less plausible to argue that they are incapable of rational responses because of their inherent conceptual limitations. Such variability across contexts or tasks would suggest instead that young children might grasp the relevant basic concepts but sometimes fail to demonstrate their grasp because of extraneous factors (e.g., unusual pragmatics, unfamiliar contexts, tasks that exceed their linguistic ability). In what follows, I review evidence revealing substantial variability in the judgments that the canonical view sought to explain.

### ***Insensitivity to Outcomes***

Do young children always fail to integrate information about outcomes into their competence judgments? Are they blindly optimistic about their abilities and their chances of success? The answer is "no." In fact, I have already reviewed evidence that preschoolers are perfectly capable of factoring outcome information into their judgments: Past performance is routinely taken

into account when evaluating and making predictions about others' performance (Stipek et al., 1984); young children's optimism is restricted mostly to assessments of their *own* competence. In many contexts, however, young children use evidence to adjust their self-evaluations as well. For instance, when 4-year-olds rank themselves and their peers on dimensions that are familiar and meaningful to them (e.g., how fast they can run), their rankings actually correspond with objective measures (Morris & Nemcek, 1982; see also Marsh, Ellis, & Craven, 2002). When their past failures are made salient, such as when their unsolved puzzles are left out in front of them, 4- and 5-year-olds lower their expectations of future success (Hebert & Dweck, 1985, described in Dweck, 1991; see also Stipek et al., 1984). Similarly, many 5- and 6-year-olds display negative self-evaluations and low expectations when their performance is criticized by an adult, which also makes failure salient and relevant to children (Heyman et al., 1992).

More generally, the claim that young children are irrationally optimistic about their abilities is difficult to reconcile with their behavior outside the laboratory (Butler, 2005). In real life, young children's achievement behavior does not seem qualitatively different from that of older children and adults. Even casual observations of a preschool classroom, for example, are likely to reveal that 4-year-olds generally know when they have failed and when they have succeeded, and adjust their behavior accordingly (e.g., asking for help when they run into difficulties). In addition, failure often takes a toll on young children's motivation, much like it does on that of older children. Many preschoolers give up on tasks they cannot master in a few tries; they do not simply breeze past their failed attempts as if nothing happened. Moreover, young children's self-assessments outside the laboratory are not consistently off-base; many children seem to have surprisingly precise insights into their abilities. I remember, for example, talking to a preschooler who explained that she could cross the monkey bars in only one way—by getting both hands onto one bar before reaching for the next. She knew that other

children could cross the monkey bars faster, using only one hand per bar, and it was clear to her that she could not. To the extent that these observations capture young children's actual achievement cognitions and behavior, they also raise doubts about the claim that children this age are undaunted optimists who always overestimate their abilities.

#### *Absence of, and Insensitivity to, Social Comparisons*

The canonical view is premised in part on the idea that young children are neither motivated nor able to (1) *engage in* social comparisons, and (2) *use* social comparisons to evaluate their abilities. However, these empirical claims may not be valid. Much of the evidence supporting them came from laboratory studies in which the social comparison information was provided to children in unfamiliar, decontextualized ways. For example, a classic study measured whether young children engage in social comparison by counting how often they pressed a button to display an image of another child's work on a video monitor—arguably, quite unlike what children might do outside the laboratory to obtain this sort of information (Ruble, Feldman, & Boggiano, 1976). Similarly, studies investigating whether children make use of social comparison information often presented this information in complex, abstract formats that may not have held much meaning for young children. For example, Nicholls (1978) showed children cards with 18 schematic faces that differed in color (yellow vs. white) depending on whether the individuals depicted could or could not solve a problem. Although adults are familiar with such symbolic means of depicting frequencies or proportions, young children are probably not.

Evidence obtained with simpler, more naturalistic methods contradicts these claims and suggests instead that young children both perform and use social comparisons. Observational studies of classroom contexts, for example, revealed that social comparison behaviors such as looking at other children's work or making comparative statements are common as early as kindergarten (e.g., Pomerantz, Ruble, Frey, & Greulich,

1995) and even preschool (e.g., Mosatche & Bragonier, 1981). Given that young children can accurately estimate their own and others' relative standing on meaningful dimensions (e.g., Morris & Nemcek, 1982; Stipek, 1981), this seems hardly surprising: It is difficult to see how children could rank themselves and their classmates with any degree of accuracy if they were completely uninterested in, or incapable of performing, social comparisons.

Notably, this rank-estimation evidence also suggests that young children *use* social comparisons to inform their evaluations of themselves and others, contradicting earlier claims (e.g., Ruble et al., 1976, 1980). Young children's sensitivity to social comparison information was subsequently documented in experimental work as well, using simpler paradigms that better reflected how young children might compare themselves to others in everyday contexts. For example, Butler (1998) used a drawing task in which children had to trace as much of a winding path as they could in a certain amount of time. Children were then shown the drawing of a child who had clearly traced more or less of the path than they had. In this context, even 4- and 5-year-olds took notice of the comparison: They judged that they did less well—and even that they were less good at tracing tasks in general—when the other child traced more than they had (see also Rhodes & Brickman, 2008). Preschoolers' motivation was also affected by the social comparison information, as was that of older children. Children who experienced relative failure often avoided the tracing activity when allowed to choose between it and another activity.

In summary, there is little evidence of a sharp discontinuity between younger and older children's reasoning about competence. Whether one looks at young children's ability to incorporate outcomes into their evaluations or at their motivation to engage in social comparisons and their use of this information in their subsequent judgments, the same conclusion emerges: In contexts that are familiar and meaningful, young children's competence judgments are much more similar than dissimilar to those of older children, as are their motivational patterns in response to failure. Thus, the

irrational judgments that the canonical view was formulated to explain may be, in some measure, an artifact of the methods initially used to investigate young children's thinking.

### ***Are There Sharp Discontinuities in the Concepts Underlying Competence Judgments?***

The preceding section suggests that reasoning about competence is relatively continuous across development. In and of itself, this conclusion makes moot any claims of discontinuities in the underlying concepts. However, even when judged on its own merits, the idea that development brings about radical transformations in the concepts involved in reasoning about competence is out of step with contemporary developmental science. Although children's information-processing abilities (e.g., working memory capacity, inhibitory control) and their knowledge undoubtedly grow as they get older, their understanding of the world does not change in fundamental ways. Below, I briefly review recent evidence against the conceptual limitations invoked by the canonical view. Where relevant, I also articulate the implications of this new evidence for children's motivation.

### ***Egocentrism***

Is it possible that young children's seemingly inflated self-views arise because they are egocentric—unable to consider other people's perspectives about themselves (e.g., Harter, 2012)? Others' negative views about them should lower their self-assessments, so perhaps children's positivity is due in part to a failure to understand other people's mental states. This claim is implausible. In fact, even infants understand that others' perceptions, preferences, beliefs, and so forth, may be different from their own (e.g., Luo & Johnson, 2009; Onishi & Baillargeon, 2005; Repacholi & Gopnik, 1997; for a review, see Baillargeon et al., 2016). The prior evidence for egocentrism, as well as for other major flaws in young children's "theory of mind" (e.g., Wimmer & Perner, 1983), was largely a methodological artifact. The use of tasks that needlessly taxed young children's

information-processing resources made it appear that they had a limited understanding of others' minds, when in fact their understanding was fairly sophisticated (e.g., Baillargeon, Scott, & He, 2010).

### *Inability to Compare Abstract Quantities*

Can it be that young children's seeming insensitivity to (relative) failure is due to their inability to compare abstract quantities, which prevents them from realizing when their performance is inferior to others' (e.g., Harter, 2012)? Contrary to this possibility, it seems that humans are actually born with the ability to perform such abstract quantitative comparisons. For instance, newborns familiarized with strings of four syllables subsequently looked longer at images containing four objects than at images containing 12 objects, and vice versa—newborns familiarized with strings of 12 syllables looked longer at sets containing 12 rather than four objects (Izard et al., 2009; see also Jordan & Brannon, 2006). Newborns' ability to compare numerical quantities across sensory modalities speaks to the abstractness of the numerical and quantitative representations with which our species is endowed (for a review, see Hyde, 2015). Thus, there is no reason to believe that an inability to make abstract quantitative comparisons hinders children's reasoning about competence.

### *Overly Concrete Mental Representations*

The seeming irrationality of young children's reasoning about competence was also attributed to the concreteness of their mental representations, which was argued to prevent them from conceiving of general, abstract abilities (e.g., Harter, 2012). However, as illustrated by the foregoing discussion of numerical concepts, young children's thinking turns out to be surprisingly powerful and abstract. This conclusion is supported by a wide range of studies investigating how infants generalize from experience (e.g., Dewar & Xu, 2010; Yin & Csibra, 2015), how they learn language (e.g., Marcus, Vijayan, Rao, & Vishton, 1999; Smith, Jones, Landau, Gershkoff-Stowe, & Samuelson, 2002), how they reason about the

relations between objects (e.g., Ferry, Hespos, & Gentner, 2015; Walker & Gopnik, 2014), how they reason about living organisms (e.g., Setoh, Wu, Baillargeon, & Gelman, 2013; Simons & Keil, 1995), and so on. Thus, there is no longer any reason to be skeptical of young children's ability to think abstractly about their achievement experiences (in fact, see Cvencek, Greenwald, & Meltzoff, 2016; Marsh et al., 2002).

### *Immature Reasoning about Physical Causality*

Perhaps young children don't understand how the physical world works, believing that their wishes—in and of themselves—have causal effects. This misunderstanding was thought to be part of the reason why young children display overly optimistic performance expectations (e.g., Stipek, 1984). However, none of the subsequent research on early causal reasoning provides any support for this “wishful thinking” claim. On the contrary, humans' basic understanding of physical objects and their causal interactions seems, by and large, to be preserved across development (for reviews, see Baillargeon, 2004; Spelke & Kinzler, 2007) and even across species (e.g., Chiandetti & Vallortigara, 2013; Wood, 2013). Importantly, this initial understanding is unlikely to contain any “wishful” beliefs. Consider, for example, that when 9-month-olds were allowed to reach toward one of two similar-looking boxes that differed in weight, they reached preferentially toward the lighter box, which they had been able to manipulate more easily in the past (Hauf, Paulus, & Baillargeon, 2012). Thus, infants do not disregard past failures—they do not expect that just because they might wish it so, all of a sudden it might be easier to play with the heavier box. This result, and others like it (e.g., Hespos & Baillargeon, 2008), speak against the idea of irrational optimism in early causal reasoning.

All this being said, even if young children did occasionally allow their wishes to color their judgments, they would be in good company: Motives and desires influence reasoning throughout life and across domains, to the point that adults may also be reasonably characterized as “wishful thinkers” (e.g., Hughes & Zaki, 2015; Jost, Glazer,

Kruglanski, & Sulloway, 2003; Mather & Carstensen, 2005). If adults' concepts are not deemed inadequate simply because their reasoning is sometimes motivated, children's concepts should not be either (see also Butler, 2005).

### *Inability to Understand Ability as a Trait*

Arguably, the most influential claim of the canonical view is that young children cannot understand ability as a capacity or trait (e.g., Harter, 2012; Nicholls, 1978, 1984, 1990), partly because they cannot understand behavior in terms of stable traits in the first place (e.g., Rholes et al., 1990). Young children's immature concept of ability (as depending exclusively on effort) was thought to account for their optimistic outlook on achievement. Despite its remarkably persistent influence on the field, this claim does not fare any better than the others when evaluated against the relevant evidence.

Let us consider, first, the broader claim that children do not understand others' behaviors in terms of underlying traits—that is, stable psychological tendencies that predispose people to act a certain way. Several researchers have pointed out that in many of the studies providing evidence for this claim, children's responses were judged against an unreasonably high bar: Children were told about one trait-relevant behavior (e.g., Jill shared part of her lunch with a child who had nothing to eat) and were asked whether the protagonist would exhibit behavior consistent with this trait in a different circumstance (e.g., Will Jill help another child rake the leaves in the yard?; e.g., Rholes & Ruble, 1984; Rotenberg, 1980). To show that they understood traits in such a task, children would need to go through a complicated chain of reasoning (for details of this argument, see Heyman & Gelman, 1999; Liu, Gelman, & Wellman, 2007). Specifically, children would need to (1) infer a stable trait (e.g., generous) on the basis of a single trait-relevant behavior (e.g., sharing one's lunch) (behavior → trait step), then (2) use the inferred trait to predict a different trait-consistent behavior in a different context (e.g., helping with yard work) (trait → behavior step). Not only do such tasks involve a multistep inferential chain,

but they also assume that the influence of traits on behavior is more deterministic than seems warranted; that is, one can fully appreciate that human behavior is guided by traits, yet still be unsure whether the protagonist will spend “all her play time raking leaves” (Rholes & Ruble, 1984, p. 552) just because she shared part of her lunch with someone who had nothing to eat.

Evidence obtained with simpler, less ambiguous tasks suggests that young children do in fact possess the concept of a dispositional trait. Even 3- and 4-year-olds infer traits from relevant behaviors, especially when these behaviors are intentional and frequent (e.g., Boseovski, Chiu, & Marcovitch, 2013; Boseovski & Lee, 2006; Giles & Heyman, 2003; Hermes, Behne, & Rakoczy, 2015; Liu et al., 2007). Moreover, 3- and 4-year-olds reliably use trait information to predict a person's future motives, behaviors, and emotional reactions (e.g., Heyman & Gelman, 1999, 2000; Hermes et al., 2015; Liu et al., 2007; see also Boseovski et al., 2013; Boseovski & Lee, 2006; Cain, Heyman, & Walker, 1997).

Strikingly, even infants seem to have a basic understanding of dispositional traits, consistent with the recent surge of evidence suggesting sophisticated mental-state understanding early in life (e.g., Baillargeon et al., 2016). For example, 15-month-olds expected a person who had repeatedly displayed anger toward an action to continue displaying this emotion on later occasions when similar actions were performed (e.g., Repacholi, Meltzoff, Toub, & Ruba, 2016; see also Kuhlmeier, Wynn, & Bloom, 2003; Repacholi, Meltzoff, Hennings, & Ruba, 2016); 13-month-olds expected a person who had performed an action with several objects (e.g., sliding them back and forth) to continue performing this action with different objects on later occasions (e.g., Song, Baillargeon, & Fisher, 2005); and 5-month-olds expected an unfamiliar agent who had repeatedly reached toward one of two objects to continue reaching toward the preferred object, even when their positions were later switched (Luo & Baillargeon, 2005; see also Luo & Johnson, 2009; Woodward, 1998).

Why did the infants expect behavioral consistency in these studies? In particular, did they actually attribute a disposition to

the actor, or were their expectations driven by shallower processes (e.g., a superficial tendency to expect more of the same)? Although this question cannot be conclusively settled with the data available, two considerations favor the richer, trait-based interpretation. First, infants did not display the same expectations of consistency in control conditions that were superficially similar to those described earlier. For instance, the 5-month-olds in Luo and Baillargeon's (2005) experiments did not expect the agent to reach toward the same object on later occasions if that object had been the only one present during the initial phase. It was only when infants saw the agent actively choose between two objects during the initial phase—that is, when they had evidence for a *preference* (a disposition)—that they later expected behavioral consistency. Second, since 3- and 4-year-olds seem to understand traits already (e.g., Heyman & Gelman, 1999, 2000; Liu et al., 2007), it seems uncharitable to interpret infants' trait-like judgments as driven entirely by low-level processes. How likely is it that infants' expectations of behavioral consistency arise from superficial associations when (1) their expectations are nuanced and context-sensitive, (2) there is extensive independent evidence for sophisticated theory-of-mind abilities at this age (e.g., Baillargeon et al., 2016), and (3) the same expectations of consistency seem to stem from a veridical understanding of traits in children who are only slightly older?

In summary, young children interpret others' behaviors in terms of stable underlying traits at least by the age of 3 or 4 years, and perhaps as early as infancy. In and of itself, this evidence casts some doubt on the claim that young children cannot understand *ability* as a trait (e.g., Harter, 2012; Nicholls, 1978, 1984, 1990). Aside from this general reason to be skeptical, there are now many findings that contradict this claim directly. These findings suggest instead that young children are able to interpret competence-related behaviors, just like any other behaviors, as arising from stable underlying dispositions.

First, ability-related traits were featured in some of the previously mentioned studies that documented trait reasoning in

young children. For example, 4-year-olds who saw an actor provide accurate, detailed names for a number of objects (e.g., supersonic airplane, fusilli pasta) subsequently judged this actor to be “smarter” (but not “stronger” or “nicer”) than an actor whom they had seen successfully lift a number of heavy objects (e.g., a potato sack, a big suitcase; Hermes et al., 2015). Moreover, they expected the “smart” actor to be able to name other, unfamiliar objects, as well as succeed in a number of knowledge-based (but not strength-based) activities. The latter result suggests that children had a relatively abstract understanding of the trait “smart,” extending it to an appropriately broad set of activities beyond the ones initially used to infer the trait. The 4-year-olds also accurately labeled the actor who had been able to lift heavy objects as “stronger” (but not “smarter” or “nicer”) than the other actor, and they expected this “strong” actor to be able to manipulate unfamiliar objects with ease and succeed in other strength-based (but not knowledge-based) activities. This nuanced pattern of competence judgments and predictions contradicts the view that young children's concept of ability is inadequate. A concept that simply equates ability with effort cannot account for 4-year-olds' domain-differentiated, sensible responses in this and similar studies (e.g., Cain et al., 1997; Marsh et al., 2002).

Second, consistent with the idea that younger and older children have access to similar ability concepts, Heyman and Compton (2006) demonstrated that young children give “mature,” ability-as-trait responses with a minimal change to the classic Nicholls (1978) task. Recall that, in this task, children are asked to reason about two actors who get the same score on a test despite spending different amounts of time working on it. The first question children are always asked in this task is, “Was one working harder or were they the same?” (Nicholls, 1978, p. 803; see also Nicholls & Miller, 1984b). The fixed order of the questions in this task raises the following possibility: Perhaps young children's responses to the subsequent questions about ability typically reveal an ability-as-effort conception simply because the first question (about working hard) activates this conception.

If so, asking a question that activates the ability-as-trait conception instead should produce a corresponding shift in children's responses to the later ability questions. For example, we might ask children whether one actor found the test *easier*. Even 2-year-olds recognize that someone who needs to exert less effort to complete a task finds it easier (Jara-Ettinger, Tenenbaum, & Schulz, 2015; see also Heyman & Compton, 2006). Moreover, prompting children to think about differences in the actors' mental states (rather than just their behaviors) may draw their attention to differences in the underlying mental capacities (Heyman, Gee, & Giles, 2003), thereby activating the ability-as-trait conception. In turn, activating this conception might lead children to give more trait-based responses to the subsequent questions about the actors' abilities (assuming, of course, that young children possess the ability-as-trait conception in the first place).

Following this logic, Heyman and Compton (2006) presented Nicholls-style vignettes to kindergartners and simply manipulated which question was asked first: whether the actors tried hard or not on the test (as in the original task), or whether the actors thought the test was easy or difficult. When first asked whether the actors tried hard, children did not subsequently judge the faster actors to be smarter, consistent with the findings of Nicholls (1978) and others. However, when first asked whether the actors found the test easy or difficult, the vast majority of children (82%) *did* judge the faster actors to be smarter and the slower actors to be less smart, as would be expected if this question had prompted children to think of ability as a trait (Heyman & Compton, 2006, Study 2). Also consistent with this possibility, the easy-difficult question led children to predict that the slower actor would do "worse than most of the kids in [the] class" in the future, which suggests that they attributed a stable trait to this person (Study 3). Similarly, a full 65% of the children primed with the easy-difficult question also agreed that "some people . . . could never be really good" (which is a clear expression of the ability-as-trait perspective), compared with only 29% such responses when the effort question was first. In summary, the results of this simple manipulation suggest that young children

have access to the same ways of thinking about ability as older children and adults, and that subtle features of the context determine which of these ways is most salient to children at a particular time.

Third, not only can young children conceive of ability as a trait, but they also display the maladaptive behaviors that often accompany this conception in older children and adults. Experiments on the effects of trait versus nontrait praise provide direct evidence for this point. For example, when 4-year-olds' successes were praised with a trait term (e.g., "You are a good drawer"; see also Gelman & Heyman, 1999), they reacted more negatively to later mistakes than when their successes were praised with a nontrait phrase that was otherwise analogous (e.g., "You did a good job drawing"; Cimpian, Arce, Markman, & Dweck, 2007; Morris & Zentall, 2014; Zentall & Morris, 2010, 2012). Note that, initially, the trait and nontrait praise statements were equally rewarding: Regardless of which praise they got, children felt happy and competent. However, their reactions diverged dramatically the moment they made a mistake. Relative to children who received the nontrait praise, children who had been told they were "good drawers" felt sadder, thought they were less good at drawing, and said more often that they would not want to draw again in the future—in short, they displayed the helpless reaction to failure that is common when people conceive of ability as a fixed trait that is out of their control (for similar results, see Cimpian, 2010; Cimpian et al., 2012; Kamins & Dweck, 1999; Rhodes & Brickman, 2008). These findings underscore that even young children are capable of conceiving of ability as a trait, with all that entails for their self-evaluation, motivation, and achievement. Moreover, these studies highlight how exquisitely sensitive to context children's conceptual frameworks are. A few simple statements from an unfamiliar experimenter were able to shift how children conceptualized their successes and, subsequently, how they reacted to failures.

### **Interim Summary**

The evidence in this section suggests that competence judgments and concepts do not

change qualitatively across development. The canonical view, despite its intuitive appeal and continuing influence on the field, is no longer tenable. Young children can make sense of their achievement experiences in all the same ways that older children can, and they are thus vulnerable to the same negative, helpless patterns of cognitions and behaviors.

### WHAT EXPLAINS THE GREATER POSITIVITY IN YOUNG CHILDREN'S JUDGMENTS?

This final section is intended to resolve a lingering tension. On the one hand, it is clear that young children's judgments are not *blindly* optimistic. Under certain circumstances, they can be as realistic as older children are—consistent with the argument that they have access to similar competence-related concepts. On the other hand, young children's answers in many studies do have a more optimistic bent than those of older children. What explains this tendency toward positivity, especially if conceptual limitations are not to blame? As anticipated earlier in the chapter, the answer might have to do with the dominant messages in children's environments. What changes across development is not the content of children's ability concepts, but rather which of these concepts or perspectives is emphasized in their daily lives. Many children's early environments (e.g., home, daycare, preschool) are centered around learning and growth (e.g., Butler, 2005; Eccles et al., 1984; Rosenholtz & Simpson, 1984; Stipek & Daniels, 1988). These environments are relatively unstructured, with children having considerable control over the activities in which they engage. Because there are few group activities (at least academic ones), children often cannot compare their performance with same-age peers on the same task. In addition, children's performance is seldom formally evaluated, especially since children this age are expected to acquire only very basic skills (e.g., counting from 1 to 10, reciting the alphabet). In summary, in children's early environments, success is largely a function of paying attention and trying hard; differences between children in their

skills and capacities are of little importance. As children progress through the school system, however, the frequency of challenging, teacher-directed, whole-class activities—which provide ample opportunities for social comparison—increases considerably, and with it the prominence of grades, class ranks, and other formal systems of evaluation. Such environments inevitably draw attention to differences between children's abilities, highlighting the idea that success depends on more than just paying attention.

Thus, young children's responses may be somewhat more positive and effort-focused than older children's because that is the default perspective they bring with them to the laboratory. Young children are perfectly capable of adopting the alternative, ability-as-trait perspective (with its more realistic outlook and its higher risk of helpless reactions to setbacks), but they are unlikely to do so unless somehow prompted. I have already reviewed some evidence that supports this view. For example, despite young children's typical focus on effort, just a few statements or questions from an adult seem sufficient to prompt children to think of ability as a trait (e.g., Cimpian, 2010; Cimpian et al., 2007, 2012; Heyman & Compton, 2006; Morris & Zentall, 2014; Zentall & Morris, 2010, 2012). Also consistent with this view, young children whose home environments differ systematically in whether effort or traits are emphasized seem to adopt different "default" beliefs about ability as well (Gunderson et al., 2013; see also Haimovitz & Dweck, 2016; Pomerantz & Kempner, 2013). The structure of young children's classroom environments (e.g., more vs. less evaluative) is similarly predictive of their competence judgments. For example, in kindergarten classrooms that were more regimented, and in which evaluative feedback was more common and salient, children were significantly more realistic when estimating their class rank (Stipek & Daniels, 1988; see also Butler & Ruzany, 1993). This evidence converges on the idea that young children can flexibly switch between different ways of conceptualizing ability, depending on their experiences; the fact that they are typically optimistic is just a reflection of their typical environments. An implication of this view is that systematic changes in

young children's environments, such as those currently under way in the American education system (Bassok et al., 2016), are likely to bring about corresponding shifts in how children reason about ability. In the coming decades, kindergartners' default perspective on achievement may bear little resemblance to that of the resilient kindergartners from 20 or 30 years ago.

The relative positivity of young children's judgments may also be due to the relative appropriateness of *self-congratulatory behaviors* in the first few years of life (e.g., Butler, 2005; Frey & Ruble, 1987; Pomerantz et al., 1995). In many contexts, it is socially acceptable, even desirable, for young children to boast about their abilities and performance, even when their claims are not entirely warranted. Parents of young children (in the United States, at least) may encourage these self-congratulatory behaviors partly as a means of fostering children's self-esteem (e.g., Miller, Wiley, Fung, & Liang, 1997). With age, however, overt behaviors of this sort are increasingly perceived as undesirable, not just by adults but by children themselves. For example, in Pomerantz and colleagues' (1995) study, only about 5% of kindergartners had a negative perception of others' boastful statements (e.g., "My picture is the best"), whereas more than 50% of fourth and fifth graders did. Paralleling this increase in negative perceptions, the frequency of the behaviors themselves (i.e., overt comparison statements) declined sharply. These shifting norms likely explain part of the decrease in children's self-reported optimism about their abilities. To the extent that statements about one's high ability are not frowned upon in young children's everyday lives, such statements may be relatively common in response to an experimenter's questions. (Interestingly, although self-congratulatory behaviors become less socially acceptable with age, the motivation to present oneself in a positive light might actually ramp up, as children are exposed to an increasingly competitive environment in which it is desirable to look more competent than others [e.g., Butler, 1998]. Thus, children need to learn how to balance the desire to enhance their image in others' eyes with the social costs of doing so.)

In summary, the relative positivity of young children's competence judgments is likely to arise not from their conceptual shortcomings but rather from the fact that their typical social environments (1) emphasize effort and downplay individual differences between children, and (2) condone, or even encourage, self-congratulatory judgments and behavior.

## CONCLUSIONS

Young children's competence judgments are often portrayed as qualitatively different from those of older children (e.g., grossly inflated, irrationally oblivious to evidence). Moreover, these differences in judgments are often claimed to be due to flaws in the mental representations with which young children reason about competence (e.g., inadequate concepts of ability, traits, causality, quantity). The evidence reviewed here suggests that neither of these claims is valid. In reality, younger and older children interpret their achievement experiences with largely the same set of concepts. And while competence judgments are on average more optimistic in early childhood, this difference is simply the result of contingent facts about the typical environments of young (middle-class American) children that instill a default—but easily revisable—perspective on achievement that is effort-centric and confident.

By portraying young children as irrational optimists, the outmoded ideas that currently dominate the literature have stifled research on early reasoning about achievement. There is much we do not know, but should know, about the achievement beliefs and mindsets (e.g., Dweck, 2006; Yeager, Paunesku, Walton, & Dweck, 2013) of young children: how to measure them, what shapes their content, how to change them, what their long-term effects are, and so on. The early years set a crucial foundation for children's attitudes toward school. Without a better understanding of young children's thinking about competence, we are missing an opportunity to help every child enter school with, and maintain, a productive, learning-focused mindset.

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## NOTES

1. The view that conceptual maturity, in and of itself, sets the stage for such negative outcomes raises a puzzle, though: Why do many adults persevere through difficulties (rather than giving up the moment they fail)? According to Nicholls (1990), older children and adults can choose whether to use the most sophisticated conceptual framework available to them or instead revert to young children's simpler ways of thinking. Under certain circumstances, then, even adults "can function like little children" (p. 35), taking failure in stride and redoubling their efforts on activities that their more sophisticated concepts would indicate they don't have capacity for.
2. It is worth noting that Harter's (2012) claims about early self-representations are based largely on evidence obtained from children's verbalizations—their responses to explicit prompts to describe and evaluate themselves. The exclusive reliance on such evidence is rooted in Harter's view that the ability to consciously, verbally reflect on a feature is necessary for the feature to truly be part of one's self-representations: "the 'self' is defined as how one consciously reflects upon and evaluates one's characteristics in a manner that he/she can verbalize" (p. 22).

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