Ability conceptions, motivation and development

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In this article, I use the literature on the development of ability conceptions to emphasize several points about motivation and development: (1) that development does not always proceed toward one correct or mature concept; (2) that analogous concepts or conceptual frameworks can arise at different points in development; and (3) that there is a critical difference between when a concept is formed and when it has motivational impact. Here I will show that only when ability conceptions coalesce into a coherent framework (a 'meaning system') do they begin to exert a consistent and systematic influence on children's motivation. I also suggest that within their constructed meaning systems, children may follow qualitatively different developmental trajectories.

The literature on the development of ability conceptions is a complex one. However, careful consideration of this literature can be extremely rewarding, adding a great deal to our understanding of both motivation and development.

In the present paper, I will use the literature on ability conceptions to make three developmental points:

(1) Development does not necessarily proceed toward one correct/mature concept. In contrast to much of what has been written, we will see that there is more than one correct, mature concept of ability, with strikingly different motivational consequences.

(2) Analogous concepts (and even conceptual frameworks) can arise at very different times in different domains. Here, we will see that years before children have built a motivational framework around ability conceptions, they have built a strikingly similar framework around a different aspect of the self: goodness. This has important implications for the conclusions we draw about children's self-conceptions and their cognitive-representational abilities.

(3) There is a critical distinction between when a concept is formed and when it has

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motivational impact. Here, we will see that children may develop many conceptions that are potentially relevant to their motivation but these conceptions can lie dormant for some time. Only when they coalesce into a coherent framework do they begin to exert systematic influence on children’s motivation. This leads to an important distinction between the development of a concept and the role that this concept may later play in children’s motivation through its participation in a coherent conceptual framework.

I examine these points one at a time, using research findings to illustrate each, and ending with a consideration of the developmental mysteries that remain before us.

Is there one correct/mature conception of ability?

For many years, the literature on the development of motivation assumed that all roads led children to the idea of intelligence as a stable capacity that is separate from effort, and that is inversely related to it. Specifically, it was believed that at about the age of 10–12 years, children attained and converged on this one mature conception of ability or intelligence (Dweck & Elliott, 1983; Nicholls, 1984; Stipek & Daniels, 1988).

However, intelligence is a social construction (Carugati, 1990; Cornelius, Kenny, & Caspi, 1989; Rosenholz & Simpson, 1984; Wagner & Sternberg, 1984). It is something we invented to capture the psychological functions involved in intellectual activity, and therefore more than one legitimate construction is possible. That is, different people may legitimately differ in what they think the contents, properties, or workings of intelligence are. For example, people may differ in whether they think intelligence is an underlying capacity or a repertoire of intellectual skills (see Dweck, 1999), whether they think it is stable or expandable (see Dweck, 1999; Howe, 1990; Perkins & Grotzer, 1997) and whether they think it is separate from effort or that motivational factors are a key part of it (see Yang & Sternberg, 1997).

When children form conceptions about the physical world, they often get clear feedback about the correctness of their theories. They may try to fly unassisted, or to place objects on surfaces that provide insufficient support or to fit objects into containers that are too small. With the feedback they receive, they can readily correct their theories about the nature of objects and the way the physical world works (Baillargeon, 1995).

Similarly, with language, children are typically presented with a standard against which they can match what they produce and toward which they can strive. Although language acquisition is much more than simple matching and correction, there exists a standard of native proficiency which is widely shared and to which children are exposed (see Gleitman & Newport, 1995).

However, theories about psychological entities are different. Outcomes and events typically speak far less clearly to the adequacy of a particular belief: Does an intellectual failure mean that the idea of stable capacity is correct or incorrect? Does it mean that effort is separate from, or part of, ability? There is typically no concrete external feedback about the correctness of any specific belief. Indeed, as will be seen, outcomes and events are often interpreted within the conceptions that children have, rather than leading them to refine or jettison their theory.

Why did people think that all roads led to the conception of ability as a stable entity? Researchers had found that at about 10–12 years of age, children become able to think
of intelligence in new ways, and in ways that implied that intelligence was a stable quality inversely related to effort (Nicholls, 1978, 1984). For example, when given the information that two children who worked equally hard achieved different outcomes, they can now agree that one child has more ability than the other. Or, if given information that two children put in different amounts of effort and achieved the same outcome, children can now agree that one child has more ability than the other.

What does this mean? The change in responding at this age probably does signal an advance in thinking. It may in fact mean that children are now capable of understanding the idea of a stable entity that is inversely related to another variable. And indeed this may be part of a more general cognitive change in abstract thinking that is often found to take place at around this time. In a related vein, this is also the time that children may be beginning to learn algebraic concepts, and these research tasks are tapping into emerging algebraic skills. They are giving children the values of two variables in an algebra equation (effort, performance) and asking them to solve for a third (ability).

However, the fact that children are now able to reason about ability or intelligence as a stable capacity that is inversely related to effort does not mean that this is the conception of intelligence they adopt as their own (Karabenick & Heller, 1976; Kun, 1977; Schuster, Ruble, & Weinert, 1999; Surber, 1980). In fact, in our work, we have shown that only some children (and usually only some older individuals) adopt this as their theory of intelligence and build their motivational framework around it. An equal number adopt a very different theory of intelligence, one that portrays intelligence as an expandable quality that can be developed through effort and learning (Dweck, 1999; Dweck & Leggett, 1988; see also Dweck, Chiu, & Hong, 1995). In this latter system, effort is not seen as inversely related to ability at all, but rather as something that allows people to turn on and use their abilities to maximal advantage, as well as to cultivate their abilities over time. Further, in this system, effort may not even be seen as always distinct from intelligence, but as something that is part and parcel of the functioning intellectual system—its energy or motor, or even part of the repertoire of self-regulatory skills that go into intelligent behaviour (Dweck, 1999; Yang & Sternberg, 1997).

Theories of intelligence are linked to different meaning systems

Which theory of intelligence a student chooses is of more than intellectual interest, for starting at about 10–12 years of age, children’s theories of intelligence appear to spawn a whole motivational framework that I have called a ‘meaning system’. What I mean by meaning system is a network of beliefs and goals—built around a core theory—that systematically guides behaviour.

Let us look at the two meaning systems that are built around the two different theories of intelligence. Drawing on our work (Blackwell, Dweck, & Trzesniewski, 2002; Henderson & Dweck, 1990; Hong, Chiu, Dweck, Lin, & Wan, 1999; Mueller & Dweck, 1998), I will show that the students who view their intelligence as a fixed trait (who hold an ‘entity theory’ of intelligence) build a meaning system that revolves around measuring and validating their level of fixed intelligence, whereas those who view their intelligence as an expandable quality (an ‘incremental theory’) build a meaning system that revolves around ‘process’, e.g. around effort, strategies and learning (see also Bickert, 2003; Krapp, 2003).
In two large studies, we tracked hundreds of students (of about 13 years old), making the transition to 7th grade, the first year of junior high school (Blackwell et al., 2002; Henderson & Dweck, 1990). This is a very challenging transition for students. At this time, the academic work becomes substantially more difficult (especially in mathematics), the grading becomes much more stringent, and the environment becomes far more impersonal and unsupportive (Eccles & Midgley, 1989). Typically, students' grades drop as they enter junior high and continue to do so.

Since this is the time at which students' intelligence-related meaning systems are becoming coherent and influential, we expected the challenge of junior high school to exert a powerful motivational impact but a different impact on students who held an entity vs. an incremental theory of intelligence. For those with an entity theory, who are concerned about their level of fixed intelligence, this should be a very threatening time, since failure looms large. In contrast, for those with the incremental theory of intelligence, the new challenge of junior high school should be seen more as an opportunity for increasing their intellectual skills and should spur them on to greater effort. These different views of intelligence would not predict a great deal about students' motivation and achievement in less challenging situations. Only when the work is quite difficult, and failure is a real possibility should the differences between the students with two views really emerge.

In these studies (Blackwell et al., 2002; Henderson & Dweck, 1990) we assessed students' theories of intelligence as they entered 7th grade, along with their other achievement-relevant beliefs and goals. (Students' theories of intelligence were assessed by asking them to agree or disagree with a series of statements depicting the theories of intelligence. For example, a statement representing the entity view was: 'Your intelligence is something very basic about you that you can't really change'. We then followed them across the next year (in the Henderson & Dweck study) and the next 2 years of junior high (in the Blackwell et al. study), monitoring their maths grades. Although students with the incremental vs. entity theory of intelligence had entered junior high with similar maths achievement test scores, we saw marked differences in their motivation as they coped with the new, more challenging academic environment, and we saw their grades steadily diverge.

First, the students adhering to the incremental vs. entity theory of intelligence held different achievement goals (Blackwell et al., 2002; cf. Robins & Pals, 2002). Those with the incremental view that intelligence can be expanded endorsed ‘learning goals’—goals that put the premium on learning challenging new things as opposed to just trying to look smart—significantly more than did those with the entity view that intelligence is fixed (see Pintrich, 2003).

Next, those with the incremental view, far more than their entity-oriented peers, held positive effort beliefs (Blackwell et al., 2002; cf. Dweck & Leggett, 1988). They believed that effort empowers and makes the most of your ability, can compensate for a lack of ability, and can increase your ability over time. Those with the entity view of intelligence were more likely to endorse the negative effort beliefs—that effort implies a lack of ability. Interestingly, even when students were told nothing about the difficulty of a task or about another person’s performance on a task, these students believed that the need for effort in itself signalled an ability deficit. Moreover, they believed that once a person lacked ability, no amount of effort would help.

Third, the two groups interpreted setbacks in different ways (Blackwell et al., 2002; Henderson & Dweck, 1990; cf. Grant-Pillow & Dweck, 2002). Just as those with the entity view saw effort as measuring and implying a lack of intelligence, so did they also
see setbacks as implying a lack of intelligence or a lack of ability in the area. Even an initial setback in a subject they had liked led them, far more often than their incremental counterparts, to conclude that they had no aptitude for the subject matter (see also Hong et al., 1999; Mueller & Dweck, 1998).

In the face of these differing beliefs, it is not surprising that they endorsed different strategies for dealing with setbacks in a course (Blackwell et al., 2002; cf. Grant-Pillow & Dweck, 2002; Robins & Pals, 2002; see also Boekarts, 2003). Those with the entity view more strongly endorsed such ‘helpless’ strategies as: ‘I would try never to take that course again’, 'I would study less for the next test’ and ‘I would try to cheat on the next test’. From these responses, it is clear that the entity meaning system, with its emphasis on judging ability, gives no recipe for success following a setback. If one lacks ability and effort cannot compensate, then the student might easily think: 'Why bother studying more? It won’t help and will only make me look even more inept'.

In another dramatic demonstration of the helpless strategies that are induced within this meaning system, Hong et al. (1999) found that college students who held an entity theory of intelligence showed little interest in a remedial course that could remove a skill deficit and alter the course of their academic careers. They were either unwilling to admit to the deficit or did not think that the deficit could be overcome. In either case, their theory gave them no recipe for promoting future success in the face of challenge.

In a similar vein, Rhodewalt (1994) found that students holding an entity theory were more likely to report using self-handicapping strategies. These are strategies like procrastinating on an assignment or partying the night before a test—strategies that provide ability-saving alibis for failure, but that jeopardize students’ chances for success.

To return to our students making the transition to junior high school, those holding the incremental view endorsed ‘mastery-oriented’ strategies more strongly than their peers did (Blackwell et al., 2002; cf. Grant-Pillow & Dweck, 2002; Robins & Pals, 2002). Their strategies for confronting obstacles included studying more for the next test and trying different study strategies. Again, this meaning system puts the emphasis on effort, strategies and learning and, by doing so, gives students a clear recipe for dealing with setbacks and turning them into successes.

Finally, as noted earlier, students’ theories of intelligence predicted their subsequent grades over and above their past achievement (Blackwell et al., 2002; Henderson & Dweck, 1990). In fact, in one study (Blackwell et al., 2002), students’ theories of intelligence—and not past grades—predicted change in grade over time, with the entity theory predicting steadily decreasing grades and the incremental theory predicting steadily increasing grades.

In summary, students’ conceptions of intelligence form the core of motivational meaning systems that appear to produce significantly different educational outcomes for students who begin with more or less equivalent ability.

**Are the meaning systems fixed or malleable?**

Are students’ theories of intelligence and their allied meaning systems like deep-seated personality traits, or are they more like dynamic and malleable knowledge structures? They look very much like the latter. Although students’ theories of intelligence can be rather stable if left to themselves (Robins & Pals, 2002), they seem quite amenable to change with intervention. Sometimes this intervention takes place within an experimental session, where students are asked to read a compelling science passage
that illustrates an entity view or an incremental view. In such studies (see Dweck & Leggett, 1988; Hong et al., 1999; cf. Levy & Dweck, 1999), we have found that those who are led to (temporarily) adopt one theory or the other then act in accordance with that theory. For example, those who are led to adopt an incremental vs. entity theory then adopt more learning goals (Dweck & Leggett, 1988), are more likely to take the remedial action to overcome their deficiencies (Hong et al., 1999) and are more likely to adopt positive effort beliefs (Hong et al., 1999).

We have also found in our experiments that certain types of feedback can instill a more incremental theory or a more entity theory. For example, in a series of studies, Mueller and Dweck (1998) showed that praising students' intelligence after they performed well on a task sent them more toward an entity theory than did praising their effort. Praising intelligence appeared to imply that a fixed intelligence that dwelt within them was being judged from their performance. In line with their heightened entity theory, these students became less learning-oriented and less able to cope with subsequent setbacks than the students who had received effort praise. In short, although intelligence praise is often thought to be an excellent way to build students' self-esteem and create eager and hardy learners, it instead, by fostering an entity theory, created greater vulnerability.

In contrast to these short-term experiments, sometimes the intervention is a longer-term one, designed to teach an incremental theory of intelligence and to assess the effects of this teaching on academic motivation and achievement. In a study with college students, Aronson, Fried, and Good (2001) taught a group of African-American and Caucasian students an incremental theory by means of a film and discussion and by having them tutor younger students in this theory. They then compared the students in this group to students in the control conditions who were similar in initial achievement and motivation. Those in the incremental intervention group, when examined later in the semester, now placed a greater value on their academic studies and reported more enjoyment of academic activities (such as studying and doing assignments) than did their peers in the other groups. Moreover, they earned higher grades. All of these results were especially strong for the African-American students, who presumably were able to use the incremental theory to combat stereotype threat. That is, the idea that your intellectual skills can be cultivated over time can make a stereotype message of lower ability far less threatening.

We, too, have recently completed an incremental intervention, with minority junior high school students. In this study (Blackwell et al., Study 2), students were randomly assigned to the experimental or control groups. Over eight sessions, both groups experienced study skills training, anti-stereotype messages, discussions of academic issues, and information about brain functions. However, whereas the control group learned about memory and the brain, the experimental group learned the incremental theory. They learned that the brain grows new connections every time you learn something new and that the brain is a dynamic organ that continues to form connections throughout life, depending upon your input.

At the end of the semester, maths teachers (who did not know which treatment each student had received) singled out three times as many students in the experimental group as showing marked changes in their classroom motivation. What is more, students in the incremental group showed significantly higher maths grades for the semester than those in the control group, whose grades continued to decline.

Thus, even though the control condition was an excellent one and in fact fully as
excellent as many interventions, the addition of the incremental message appeared to spur a change in motivation that led to enhanced achievement.

In summary, conceptions of intelligence and the meaning systems that form around them can be relatively stable and predictive of students' achievement. Yet, they are also dynamic and malleable knowledge structures that can be affected by interventions, and when they are, motivation and achievement appear to follow suit.

**Before mature conceptions of ability: Young children's meaning systems**

Because there was consensus among researchers that younger children (before the age of 10-12 years) did not have well-formed conceptions of intelligence or ability, there was a widespread belief that they were protected from motivational vulnerability (Dweck & Elliott, 1983; Nicholls, 1984; Stipek & Daniels, 1988). In other words, if children did not understand the idea of fixed ability, failures should not reflect badly on them and send them into a helpless reaction.

This agreement on the part of researchers was based on the assumption that only ability conceptions could rule motivation. It was not recognized that although young children may not have well-formed ability conceptions, they may have analogous conceptions and meaning systems in another domain. Indeed, another domain is earlier and more basic. As Erikson (1959) pointed out some years ago, children face a series of self-related issues before they confront the issue of competence in the school years, and most of these issues revolve around goodness.

When we socialize children in the early years, what do we focus on? The answer is that we focus a great deal on their conduct—the degree to which they follow rules and instructions or the degree to which they self-regulate appropriately (wait, share, etc.). We are shaping them to be good members of the household, of their peer group, and of society later on, and toward this end, we give them a steady stream of feedback about whether their behaviour was right, good or suitable to the occasion.

It should therefore come as no surprise that young children's motivation seems to be organized around issues of goodness and badness (Frey & Ruble, 1985; Paley, 1988; Smetana, 1985; Stipek & Daniels, 1990; Stipek & Tannatt, 1984; see also Dweck, 1998; Ruble & Dweck, 1995). Moreover, when one looks closely, one can find in young children the same kinds of theories and allied meaning systems that one finds in older children—but in terms of goodness—badness rather than in terms of intelligence. Specifically, young children (5 or 6 years old, or even younger) may have a view of goodness—badness as a stable or malleable quality of a person (Heyman, Dweck, & Cain, 1992). Those who have the stable view, like older children who hold an entity theory of intelligence, measure themselves from their outcomes and judge themselves to be bad following failure or criticism (Heyman et al., 1992; see also Hebert & Dweck, 1985; Kamins & Dweck, 1999). Also like their older counterparts with the fixed view, they do not focus on formulating strategies for future success, but instead sink into helpless or ineffective patterns of behaviour (Heyman et al., 1992; Heyman & Dweck, 1998; Kamins & Dweck, 1999; see also Smiley & Dweck, 1994).

In contrast, those with the more dynamic, malleable view remain mastery-oriented (Heyman et al., 1992; see also Hebert & Dweck, 1985; Kamins & Dweck, 1999; Smiley & Dweck, 1994). Like their older counterparts, they see effort and strategies as the key to turning the problem into a success, and some of them even spontaneously deliver quite sophisticated speeches on the topic.
Interestingly, when we have young children talking aloud or role playing with dolls during the experimental session, we find that both the entity and the incremental children are obsessed with goodness (Heyman et al., 1992; see also Hebert & Dweck, 1985; Kamins & Dweck, 1999; Smiley & Dweck, 1994). (No child ever mentioned anything about ability even in the face of failures on a puzzle or a number task.) Both entity and incremental children mention goodness frequently and appear to be giving serious thought to what makes children good or bad and whether, having done wrong, they can vindicate themselves. It is simply that the entity and incremental theorists are coming to different conclusions about these issues.

We saw that in older children, praising intelligence or effort could evoke the different theories of intelligence with their attendant meaning systems (Mueller & Dweck, 1998). So, too, with younger children, can praise for goodness vs. praise for effort/strategies evoke the different theories of goodness and their allied meaning systems. Specifically in a study by Kamins and Dweck (1999), children who were given goodness praise after a job well done, formed a more fixed view of goodness and then drew highly negative conclusions about the self when they later encountered a setback or a criticism. In line with this, they failed to come up with appropriate strategies for rectifying the situation. In contrast, those who received the effort or strategy praise, formed a more incremental view of goodness, remained optimistic despite setbacks, and were able to generate effective strategies for reaching success. Thus praise for goodness vs. praise for effort/strategies functioned very much in the same way that praise for intelligence vs. effort had functioned—orienting children toward different theories and fostering different reactions to setbacks.

In summary, we have good evidence that although children’s ability conceptions may not reach full flower until around adolescence, this does not mean that children are not forming motivational frameworks earlier or that they are not vulnerable to debilitation. Rather, it appears that children are busy trying to figure out what the self consists of and how it all works—but in a different domain, the domain that is of greatest importance to them at these younger ages.

The emergence of ability conceptions: Isolated beliefs in search of a unifying framework

Soon after children enter school, researchers see a great upsurge in their interest in ability. For example, Ruble and her colleagues have noted a dramatic increase in children’s social comparison for purposes of assessing their performance relative to other children (Frey & Ruble, 1985; Ruble, Boggiano, Feldman, & Loebl, 1980). Triggered by this interest in ability, children, over the grade school years, begin to accumulate more and more information about ability and develop more and more beliefs about ability. For instance, they begin to demarcate the domain of intellectual ability more clearly, separating it from the domain of goodness and conduct and from other types of skills (Droege & Stipek, 1993; Frey & Ruble, 1985; Heyman et al., 1992; Stipek & Daniels, 1990; Stipek & Tannatt, 1984; Yussen & Kane, 1985). In addition, they begin to understand the idea of ability as an internal quality that can have predictive value (Droege & Stipek, 1993; Rholes & Ruble, 1984; Rotenberg, 1982; Stipek & Daniels, 1990).

Yet for some time, these seem to remain isolated pieces of knowledge that are not linked to each other or integrated into a coherent system. For example, even in the
earlier school years, children can articulate a theory of intelligence, but it does not typically predict their other beliefs about ability or their behaviours in the face of academic setbacks as it does in older children (Bempechat, London, & Dweck, 1991; Cain & Dweck, 1995). In other words, these ideas have not formed themselves into a meaning system or acquired motivational value.

As another example, in the early school years, as children begin to tune into academic outcomes and begin to understand the idea of ability, they can understand when they have not done well and when they might be demonstrating lower ability than their peers (Benenson & Dweck, 1986; Butler, 1990; 1999; Ruble et al., 1980). However, when this happens, it does not seem to lead them to lose interest in the material or to want to avoid it in the future—as it begins to do with many older children (Butler, 1990, 1999; Stipek & Gralinski, 1991; Wigfield et al., 1997). Again, these emerging ideas about ability are not yet hooked into a meaning system and have not yet gained consistent motivational value. Even though these same outcomes viewed within the goodness domain may have had marked effects on children’s motivation and behaviour, viewed within the ability domain, they do not yet seem to have the same impact.

These findings underscore the important distinction between when ideas are formed and when they begin to have motivational value. As I noted above, children appear able to articulate their theories of intelligence some time before these theories appear to be motivationally meaningful (Bempechat et al., 1991; Cain & Dweck, 1995). It is important for developmental psychologists—cognitive and social developmentalists alike—to take note of the critical difference between understanding an idea intellectually and having it play a role in the ‘hotter’ motivational system that guides children’s behaviour.

**Ability conceptions gain coherence and impact**

It is only when children reach the age of 10–12 years that their assorted ideas about ability coalesce and begin to exert systematic impact on their motivation (Bempechat et al., 1991; Cain & Dweck, 1995; Nicholls & Miller, 1984; Rhines, Blackwell, Jordan, & Walters, 1980).

First, the beliefs themselves appear to become organized into the coherent meaning systems I described in detail at the outset (Blackwell et al., 2002; see Dweck, 1999). The theories of intelligence now begin reliably predicting students’ goals, their effort beliefs, and their attributions for setbacks, with the entity meaning system organized around judging intelligence and the incremental meaning system organized around the processes that develop intellectual skills.

Further, the beliefs now begin to exert their impact on academic behaviour and academic achievement (Blackwell et al., 2002; Henderson & Dweck, 1990; see also Pomerantz & Ruble, 1997). For example, within the entity system, setbacks now seem to sap motivation, leading to decreasing effort and poorer performance, whereas within the incremental system, setbacks seem to inspire heightened effort and strategizing, often leading to improved performance.

That these ability meaning systems coalesce at around adolescence raises the idea that the different meaning systems may foster different developmental pathways through adolescence. It is this idea that I take up in the next section.
**Meaning systems can define developmental pathways**

One major implication of the foregoing discussion is that as children grapple with the issues that confront them at each point in development, they may form a network of beliefs (a meaning system) that they use to understand the domain and to cope with issues in that domain. However, the fact that children can form different meaning systems—be they about goodness, ability or relationships—suggests that different children may be inhabiting different psychological worlds as they negotiate developmental transitions and work their way through developmental periods.

If we accept Erikson's (1959) age-old idea that students enter adolescence asking themselves 'Who am I?', we can see that students who adopt different theories of intelligence may mean entirely different things by this question. Entity theorists may mean: 'Am I smart or dumb? Am I a winner or a loser?' The adolescent transition then becomes a very tense time of proving one's ability and avoiding situations that can undermine one's sense of ability—or performing tasks in a defensive or low-effort way that does not put one's ability to the test.

In contrast, to incremental theorists 'Who am I?' may mean: 'What am I interested in? What skills do I want to develop? What do I want to become?' Viewed in this way, adolescence can turn into a more exciting time of exploration and self-development. Moreover, their learning goals may give incremental theorists the leeway to stumble, have false starts, and simply go back to the drawing board without doubting the worthiness of their basic traits.

Often, developmental psychologists view children as going along the same pathways, with some just going more quickly, or more smoothly, or farther. The present view, however, depicts children as constructing important parts of their psychological worlds and then moving through these worlds in qualitatively different ways.

In summary, the meaning systems that children construct can define the tasks of adolescence (or other developmental periods) for them in very different ways. Understanding these kinds of meaning systems and the different motivational tasks they set forth for children is an important future goal for developmental psychologists.

**Remaining developmental questions and mysteries**

I have argued that close consideration of the literature on the development of ability conceptions can yield a host of interesting insights about motivation and about development. Yet many questions remain.

First, I have described a powerful motivational system in older children and its analogous system in younger children, but what happens in between? I have shown that in between those times, ability beliefs are developing but have limited motivational value. Does the earlier, goodness-based system continue to be in play in those in-between years (see Heyman & Dweck, 1998), or is it indeed a protected period in the sense that no powerful motivational framework is creating heightened vulnerability to negative outcomes?

What is the relation between the earlier good/bad-driven motivational system and the later intelligence/ability-driven system? Does the latter grow out of the former, for example, with the ability system being differentiated from a more amorphous good-bad self? Or is the ability-related meaning system created anew on the basis of experiences?
in that domain. The answer could well be a combination of the two, with the early good–bad system biasing children’s perceptions of the new ability domain (see Heyman & Dweck, 1998), but with the experiences in the new domain also playing a role (see Butler & Baumer, 2001).

After the ability meaning system is formulated, what happens to the early good–bad system? Does it continue to exist, guiding behaviour in other domains? Does it lurk in the background in the form of contingent or non-contingent global self-worth, with the entity theorists continuing to doubt the self when things go wrong (see Burhans & Dweck, 1995)?

What about other domains, like peer relationships? There is evidence that meaning systems are forming in these other domains along with ability beliefs (see Benenson & Dweck, 1986; Erdley, Cain, Loomis, Dumas-Hines, & Dweck 1997; Levy & Dweck, 1999). It would be fascinating to map the motivational changes that take place in a variety of domains as the relevant meaning system emerged.

**Summary and conclusion**

In this article, I have highlighted three points. First, in much of motivation (and perhaps in much of social development), development does not proceed toward one correct/mature concept. Unlike much of cognitive development and language development, where clear endpoints are available to the child, and incorrect hypotheses receive salient disconfirmation, in the realm of self-conceptions (or relationship conceptions), alternative ways of constructing the world are possible. Indeed, toward the end of his life, Piaget (Piaget, Garcia, Davidson, & Easley, 1991) admitted that the world views children developed might be as important to them in structuring their worlds as the logical concepts he studied for much of his life.

Second, analogous motivational/conceptual frameworks (meaning systems) can arise at very different times in different domains. These arising meaning systems may be linked to the issues that are focal at that time in the child’s life.

Third, there is an important distinction between when a concept is formed and when it has motivational impact. As I demonstrated, knowledge and beliefs about ability are arising over the early school years, but it is not until later on that these ideas are organized into a coherent system and begin to exert strong or consistent motivational value. Often researchers attempt to assess the impact of a belief on motivation without regard to the age of the child. According to the present view, one would not expect a link between beliefs and motivation in a domain before those beliefs are organized enough to shape the child’s goals and to guide the child’s behaviour in a systematic way.

Finally, I argued that the meaning systems that children develop can lead them along qualitatively different developmental pathways. Adolescents believing in fixed traits of the self and adolescents believing in personal qualities that can be cultivated may move through adolescence asking different questions (Am I smart or dumb? Am I a winner or a loser? vs. What am I interested in? What skills and knowledge do I want to cultivate?) and therefore setting different life tasks for themselves during this important developmental period.

In conclusion, the literature on the development of ability conceptions is of interest in its own right, but it has also allowed us to raise key issues about motivation and about development in general. As a field, the study of motivation straddles different areas
within developmental psychology. The development of beliefs and knowledge are typically issues of cognitive development, often with little consideration of how beliefs affect behaviour or adjustment. The topic of adaptive patterns of achievement and social relationships is typically treated within social development, but often with little consideration of the emerging belief systems that may underlie these patterns. As such, the field of motivation may have a unique role to play in forging a stronger link between cognitive and social development, asking questions both about the children’s emerging understanding of themselves and their world and about the role that this understanding plays in their adaptive functioning.

References


