UNIVERSITY OF CALIFORNIA, SAN DIEGO

Increasing Challenge-Seeking and Persistence in Young Children: A Curriculum for Families in an Informal Setting

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by

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The Thesis of Marie Lockton is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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Chair

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Dedication

For my father, William Mahedy, who taught me to love ideas, learning, family, generosity, and arguing.

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ABSTRACT OF THE THESIS

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University of California, San Diego, 2014

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Some children as young as four or five begin to exhibit patterns of helpless responses to challenge. Previous research suggests that how children respond to challenge may be influenced by their implicit beliefs about the nature of intelligence and talent, which, in turn, may be influenced by the type of feedback children receive from their parents. The current work sought to determine whether a whole-family curriculum

implemented in an informal parent-child playgroup could help increase challenge-seeking and persistence among young children. Four- and five-year-old children participated in activities designed to teach them about how their brains learn and how to deal with failure. Parents received training on providing feedback aimed to promote incremental frameworks in their children. Field notes, parent questionnaires and interviews with parents indicate that children demonstrated increased acceptance of challenges and more mastery-oriented responses to failures. Therefore, educators may seek to enlist the participation of parents in order to increase mastery-oriented responses to challenge in young children.

I. Introduction

"That puzzle is too hard for me." What would cause a preschooler highly accomplished in puzzle assembly to speak such a phrase when presented with a new puzzle? Since she had previously shown great enjoyment of puzzles, why would she now avoid trying a new one?

The particular four-year-old in question had taken an early interest in puzzles, much earlier than most of her peers. On the day she refused to try the new puzzle, she had, with her cousin only moments before, completed several others. Her parents had praised her accomplishments, calling her a "puzzle master." Yet, with her declaration that the puzzle was too hard, her interest in puzzles seemed to vanish instantaneously.

At first, her parents told her that the puzzle was not too hard for her. They assured her she could complete it. When their efforts proved ineffective, they said no more about it that day, but continued to suggest she try the puzzle several times over the next week, always telling her it would not be too hard. They eventually gave up, and the child did not work on another puzzle for nearly six months. When she did finally start doing puzzles again, she did them only when she was alone.

This interaction between a child, her cousin and puzzle-partner of the same age, and her parents caught my attention since it seemed to fit with a pattern I had been noticing with many of the preschoolers in my parent-child playgroup. I had known many of these children for several years and had watched them show remarkable persistence in such activities as learning to talk, run, and climb. Yet around the age of four or five years old, a few of the children began avoiding new challenges. When

working on a task that proved to be more difficult than expected, these children would often become negative and give up. No amount of parental reassurance of their abilities would make them persist. Others, instead, seemed unfazed by difficulty, almost becoming more excited when a task proved to be difficult.

A close examination of these patterns of responses to challenge reveals a link between how children conceptualize traits and abilities and how they proceed in potentially difficult situations. Moreover, when parents change the type of feedback they give their children, they can potentially help their children embrace challenges and persist in difficult situations. A curriculum for parents and their children in an informal parent-child playgroup setting could help parents adjust the types of feedback they give their children and allow children to view challenges as opportunities rather than threats.

II. The "I Can't Do It" Mindset

There are a multitude of reasons why some students are academically successful and others are not, or why some children learn how to form friendships while others are left on the sidelines. Societal, institutional, cultural, and familial influences all come into play. However, even two students who come from strikingly similar backgrounds may perform very differently from one another in academic or social settings. While external factors exert tremendous influence, there are still individual differences in how children respond to challenges.

Response to Challenge

When faced with a challenge or a set-back in an activity, Dweck and Leggett (1988) note that some children display a helpless response pattern, which is characterized by low persistence, challenge avoidance, negative affect, and a tendency to attribute failure to factors outside of their control. Others display a mastery-oriented response in that they remain persistent in the face of failure, redoubling their efforts and seeking new strategies.

Take, for example, a child who attempts to play with peers. If the other children respond negatively, a helpless child might attribute this social failure to his or her own undesirability. A child who is mastery-oriented, however, may assume that the other children did not want to play the game he or she had suggested. Thus, a mastery-oriented child would have no reason to assume that future interactions with peers would also be negative, but the helpless child might. This could discourage the helpless child from attempting to reach out to other children.

The same can be said for an academic challenge. When a child confronts difficulty, a helpless child would tend to attribute the problem to their own inadequacy and withdraw, whereas a mastery-oriented child might reason that he or she needs to try harder or attempt another strategy, likely leading to success.

Entity and Incremental Frameworks

A large body of research pioneered by Carol Dweck has found that children who display a helpless response tend to hold an *entity* framework, meaning that they believe that traits such as intelligence are fixed rather than malleable (Dweck & Leggett, 1988; Robins & Pals, 2002). For this reason, they view failure as a sign of their own inability, a belief which dissuades them from attempting challenging tasks (Mueller & Dweck, 1998). They prefer to choose an easier task with a higher likelihood of success.

Children with an *incremental* framework, on the other hand, believe that traits such as intelligence can be molded and improved through effort, thus making them more likely to exhibit a mastery-oriented response to challenge (Dweck & Leggett, 1988; Robins & Pals, 2002). If effort is a path to learning, then the hard work needed to accomplish difficult tasks need not embarrass these children. They often view failure as a learning opportunity rather than as a reflection of who they are as a person and display none of the negative affect of their counterparts when they do not succeed (Mueller & Dweck, 1998).

In a five-year longitudinal study, Blackwell, Trzesniewski, and Dweck (2007) examined how the type of intelligence theory (entity or incremental) students hold can affect students as they make the challenging transition from elementary school to junior high school. Academic achievement tends to decline during adolescence (Blackwell et

al., 2007; Eccles, Lord, & Midgley, 1991), and these researchers wanted to see if there was a difference in mathematic achievement between students with incremental and entity frameworks. They found that the two groups displayed no difference in prior sixth-grade math scores. Students who held incremental theories at the beginning of junior high school, however, significantly outperformed their counterparts in mathematics achievement two years later, controlling for prior performance. Other studies have also linked incremental frameworks with higher academic achievement in adolescents and college students (Aronson, Fried, & Good, 2002; Good, Aronson, & Inzlicht, 2003).

The influence of incremental and entity theories extends beyond academics. People with incremental frameworks are more likely to be shy or find it difficult to overcome their shyness (Beer, 2002). Likewise, in analyzing what takes place when children bully one another, the mechanisms of the entity framework become apparent (Dweck, 2006). Bullying involves the assumption that some people are inferior to others. It requires judgment of another person. Victims of bullies who hold an incremental framework are less likely to attribute the bullying to a deficiency of their own, and instead may reason that the bully is having a hard time dealing with his or her own personal turmoil. Yet, if no one comes to the victim's aid, these children can develop an entity framework over time (Dweck, 2006). In fact, an effective way to stop bullying is to help change the framework of the bully to an incremental framework, thereby removing their need to judge and feel judged (Dweck, 2006).

Young Children and Challenge

One might assume that young children are immune to the helpless response pattern. After all, they show remarkable persistence in learning to walk, talk, and read, and they do not possess a well-developed concept of intelligence. Yet research has shown that children as young as four can display a helpless response or mastery-oriented response just as older students do (Cain & Dweck, 1989; Heyman, Dweck, & Cain, 1992; Smiley & Dweck, 1994). Although they may not be preoccupied with intelligence, they can still hold entity and incremental frameworks. Whereas older children in an academic setting may become concerned with how intelligent they are or appear to be, younger children are more interested in goodness and badness (Heyman et al., 1992). Children who hold entity theories about goodness and badness exhibit the same characteristics as older children who hold entity theories about intelligence, and they believe that goodness is contingent upon performing well (Heyman & Dweck, 1998). That is, young helpless students who experience a failure on an academic task are likely to view that failure as a reflection of their character, display negative affect, and withdraw. In contrast, young mastery-oriented students are likely to believe that, even after a failure, they are still good and respond to failure with new strategies (Heyman et al., 1992). Likewise, young incremental theorists display more challenge-seeking than their entity-framework counterparts (Master, 2011).

Early Curriculum Response

While students may hold different types of theories for different domains, such as having an incremental framework for math but an entity framework for art, these frameworks tend to be fairly stable over time (Dweck, 2006,; Robins & Pals, 2002).

Thus, when parents express concern over a child's tendency to avoid challenge or to attribute failure to a lack of ability, their concern is justified. Since there is evidence that parental speech plays a role in the type of framework a child will later adopt (Gunderson et al., 2013), educators working with young children in a variety of informal as well as school settings might do well to consider ways to promote challenge-seeking and persistence both in and out of the home.

III. Research on Feedback and Implicit Frameworks

A review of the literature surrounding the malleability and origins of implicit incremental and entity frameworks and patterns of response to challenge reveals that educators and parents can play a significant role in the challenge-seeking and persistence of children.

Malleability of Entity and Incremental Frameworks

While it is true that the type of framework a person holds tends to be stable over time, these frameworks are also malleable. Numerous studies across age groups have shown that children can be put in the mindset of either an incremental or an entity framework temporarily and their response to challenge can then be accurately predicted (Aronson, Fried, & Good, 2002; Cury, Elliot, Da Fonseca, & Moller, 2006; Master, 2011). That is, if the researcher uses a particular type of feedback to have the child invoke an incremental framework, the child is likely to display a mastery-oriented response to challenge. If the researcher uses feedback to have the child invoke an entity framework, that child generally displays a helpless response when he or she encounters difficulty.

Even more promising is that children can be taught to adopt a lasting incremental framework, leading them to adopt more learning goals rather than performance goals, display a mastery-oriented response to setbacks, and even increase academic achievement over time (Aronson et al., 2002; Blackwell et al., 2007; Cury et al., 2006). Blackwell et al. used a computer program to teach junior high students an incremental framework, showing them how the brain changes when it is working on

challenging problems and comparing it to a muscle getting stronger. A control group that did not differ significantly from the experimental group in their academic achievement was randomly drawn from the same student body and used a computer program that taught them study skills. While the control group displayed the predictable decline in mathematics scores over the rest of the year that is common at this age, students who were taught an incremental framework saw their grades stabilize and increase over the same time period. The results held over the course of the rest of the year even though the brain workshop lasted only eight weeks.

In order to help all students succeed both academically and socially, educational research regularly recommends institutional and cultural changes that require major restructuring of education and an overhaul of societal norms. While these changes would be welcome, they are not a reality for most students in the near future. Therefore, teaching individual students ways to maximize their own effectiveness within their current setting deserves attention as well. Small changes can have a significant impact on some students' performance due to the recursive processes involved when students experience success (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Yeager & Walton, 2011). Students who are taught that their brains are getting smarter when they expend effort on challenging tasks are less likely to feel deficient when effort is required and more likely to persist with a challenge. By persisting, they are more likely to experience success, thereby achieving something they may have previously thought beyond their reach. This experience can reinforce the message that they can grow their abilities through effort and encourage persistence and challenge-seeking in the future. Greater persistence and challenge-seeking can lead to greater success. In this

way, a simple change in how students are taught to think about challenge can have a lasting positive impact, allowing a previously helpless child to consistently employ a mastery-oriented response (Yeager & Walton, 2011).

Many four- and five-year-olds are enrolled full or part time in pre-kindergarten programs and are therefore dealing with academic challenges for the first time. While their previous school experiences (if any) focused more on general child development, their pre-kindergarten classes are introducing reading, writing, and math in more structured ways. This first taste of academic work inevitably comes with comparisons to peers. It is not uncommon for parents to report that their children are mentioning the skills (such as reading, writing, drawing, and building) of their peers in comparison to their own. It is during times of transition, argue Yeager and Walton (2011), when new, more difficult challenges are encountered, that children can benefit the most from learning an incremental framework. Many four- and five-year-olds are in such a transitional period. Therefore, the recursive processes that they encounter at school and elsewhere at this age can maximize the malleability of their incremental or entity frameworks.

The Role of Parental Speech

The parental role in the type of framework young children adopt is considerable. Parental speech has long been a focus of study for its effects on young children. In this case, specifically, the type of feedback parents give their children can send often unintended messages that influence children's thinking about their innate abilities and the role of effort.

Numerous laboratory studies (see, for example, Kamins & Dweck, 1999; Mueller & Dweck, 1998; Skipper & Douglas, 2012) have shown that when researchers praise or criticize a child's effort (henceforth "process feedback"), they encourage the child to adopt an incremental framework and display a mastery-oriented response to challenge. On the other hand, praising or criticizing a child's abilities or innate characteristics (henceforth "person feedback") prompts the child to develop an entity framework and display a helpless response.

In a controlled study with 64 kindergarteners from a public school, Kamins and Dweck (1999) provided either person, outcome, or process praise or criticism to five- and six-year-olds after they successfully completed a specific task. When the children then encountered a failure, those who had received person praise or criticism believed that they were "less good, less nice, and less smart" (p. 844) than the other children did. They tended to blame themselves for the failure, focus only on the failure and disregard the earlier success, show less persistence, struggle to come up with strategies for success, and believe that a person's "badness" is stable over time and can be diagnosed from a single failure. In contrast, those who received process feedback – even criticism – still believed themselves to be good, were more persistent, and were more likely to come up with strategies for future success.

The tendency of children who receive person praise to dwell on their errors was also noted by Zentall and Morris (2012) who measured four- to seven-year-olds' eye movements when viewing pictures attributed to them. Those children who had previously received person praise fixated significantly longer on errors in the pictures

than did those who had received process praise. Those who fixated longer were also less persistent and evaluated themselves more negatively.

Building upon this laboratory research, Gunderson et al. (2013) examined the types of real-word praise parents gave their one- to three-year-olds and the frameworks that the children demonstrated five years later. Fifty-three primary caregivers, unaware that praise was the focus of the study, and all selected to represent the income, race and diversity of the of the Chicago area, were videotaped in their homes every four months for 90 minutes each going about their regular day with their children. Data were collected from these home visits when their children were 14 months, 26 months, and 38 months old and evaluated for the types of praise parents gave their children during each visit. Five years later, when the children were seven or eight years old, each of them participated in two interviews, three months apart, to assess their motivational frameworks. In the interviews, children were asked about their beliefs regarding the stability of traits, their preference for learning or performance goals, to what they attribute success and failure, and whether or not they could come up with strategies to deal with challenging situations.

Interestingly, in analyzing the data from the home visits, Gunderson et al, found that parents, in general, gave their toddlers far more neutral and outcome praise ("That's a pretty picture") than they did person or process praise. While they found that parents gave both boys and girls the same amount of praise, boys received significantly more process praise than did girls. The authors argue that this could help explain why, during their interviews years later, the seven- and eight year old boys were significantly more likely to report incremental frameworks in the intelligence domain than girls were.

Overall, the results showed that children who received the most process praise in comparison with other types of praise were most likely to hold incremental frameworks in both the intelligence and sociomoral domains years later. This was true for analysis of praise at each of the three initial age groups, that is, 14, 26, and 38 months. The results held even when the researchers controlled for the overall amount of praise children received, the incremental or entity frameworks of the parents, socioeconomic status, child gender, and the total amount of parental speech to each child.

Given that seven- and eight-year-olds have had many years of praise from a variety of sources, the predictive power of process praise parents gave them as toddlers demonstrates the privileged role of parental speech when it comes to the development of incremental frameworks.

Generic Language

Closely related to person and process feedback is generic and nongeneric language. For example, "You're a good reader" is generic feedback because it refers to a generic category of a "reader," but it is also person feedback. "You worked hard at reading" is nongeneric feedback as well as process feedback. There is reason to believe that, like process feedback, generic speech may decrease motivation. Generic speech expresses an idea about a category ("reader," "catcher," or even a statement such as "girls are good at drawing"). Similarly to person feedback, generic language implies that the person or group described possesses some stable essential trait that transcends a single instance of the described behavior (Cimpian, Arce, Markman, & Dweck, 2007; Cimpian & Markman, 2008; Gelman & Heyman, 1999). Young children tend to accept generic statements as truth with little evidence (Gelman & Bloom, 2007) and do not

easily change those beliefs, even when they observe conflicting evidence (Chambers, Graham, & Turner, 2008).

Just as with children who are told they are good at a task, children who are told that members of a wider group are good at a task (for example, "boys are good at math") demonstrate a helpless response to failure (Cimpian, 2010). When success is attributed to a fixed trait or ability, failure or struggle calls into question whether or not a person possesses that trait, leading to a helpless response. Conversely, when success is attributed to effort or strategies, failure is not a threat but a signal to redouble one's efforts (Dweck, 2006).

This connection between praise type and response pattern is illustrated by a study by Cimpian et al. (2007) who used puppets to act out scenarios with four-year-olds, some of whom were given generic praise ("You are a good drawer") and others nongeneric praise ("You did a good job drawing"). Each of the children was given a puppet and, after acting out a one-on-one scenario in which the children's puppets made a mistake that was noted by the teacher puppet, those who had been given generic praise displayed a helpless response wherein they expressed sadness, felt unsuccessful, wanted to avoid drawing, and did not come up with strategies to correct the mistake. Those who had been given nongeneric praise did not display the same extreme emotions and were able to come up with ideas for fixing the mistakes.

Outside the laboratory in the real world, children receive a mixture of generic and nongeneric feedback. To study the relative impact of each, Zentall and Morris (2010) also used puppets and a drawing scenario, but they varied the types of praise given to kindergarteners and measured their self-evaluations and persistence after

failure. They discovered that the more nongeneric praise children heard, the more likely they were to display mastery-oriented responses with higher self-evaluations and greater persistence. Furthermore, only a small amount of nongeneric praise was required to boost children's self-evaluations, but only the groups who heard mostly nongeneric praise showed greater persistence. This demonstrates the power of generic language against persistence. A large proportion of nongeneric praise is required to help buffer children against the effects of generic language they will encounter.

Whole Family Education

Given that children's responses to challenge can be heavily influenced by their implicit frameworks (Dweck & Leggett, 1988; Heyman & Dweck, 1998), which in turn are influenced by the types of feedback children receive (Gunderson et al., 2013), it seems wise to attend to the feedback habits of adults who spend time with children. For young children, most feedback they receive generally comes from their parents. Therefore, a two-pronged approach for increasing young children's challenge-seeking and persistence is warranted. Children should be taught incremental frameworks and be encouraged to embrace challenge (Blackwell et al., 2007). In addition, to support their emerging incremental frameworks, parents could benefit from a solid understanding of the effects of different types of praise and criticism and sufficient practice with process and nongeneric feedback. An educational approach that involves the whole family could have a lasting positive influence on young children.

IV. Current Approaches to Building Challenge-Seeking and Persistence

In order to increase young children's challenge-seeking and persistence, educators might have the best success by looking to programs for both children and their parents. Currently, there are few quality resources for either, and those that exist are often difficult for families to identify.

Popular Parenting Advice and Practices

Parents receive advice on how to speak to their children from a multitude of sources such as family, friends, popular books, websites, and even television. This advice is often conflicting and only occasionally rooted in research. Even sources that seem trustworthy can be confusing.

An examination of popular websites turns up a great deal of such conflicting advice. Scholastic.com offers "10 Ways to Motivate Your Child to Learn," which includes: "Celebrate achievements, no matter how small. Completing a book report calls for a special treat; finishing a book allows your child an hour of video games. You'll offer positive reinforcement that will inspire him to keep learning and challenging himself" (n.d., #8). Focusing on completion of a task is not the same thing as encouraging a child to put in the effort required to do the task well and learn along the way.

KidsHealth.org, in an article on "Top 10 Homework Tips" (2011) suggests that parents "post an aced test or art project on the refrigerator" and "mention academic achievements to relatives" (#9). This focus on achievement without is attention to effort

is what Dweck and colleagues have been cautioning against due to its potential to invoke a helpless response pattern (Dweck, 2006)

Schipani (n.d), in addressing how to raise a "confident woman," advocates providing girls with female role models who have achieved great things, but does not mention teaching the girls about the struggles and challenges those women had to overcome:

> You may have already called attention to professional soccer goalie Hope Solo's great saves, or told your daughter about political figures like Hillary Clinton or historic heroines like Ruby Bridges. While you're discussing these famous females to show your girl that she can be or do anything, don't forget the women right around you. Mention heroic women by saying things like, 'Isn't it great how Aunt Jennie is getting her master's degree now that her kids are in school? How cool is your old babysitter, who just got a basketball scholarship to college?' Take any chance you can to tell your daughter that women can be much, much more than thin or pretty (#8).

Without discussing the challenges these women faced, their accomplishments can seem like yardsticks against which children feel the need to measure themselves to gauge their own self-worth. When the emphasis is placed on achievement rather than effort, children may interpret the message to be more about ability than about hard work.

Although there is a significant amount of advice for parents that could unintentionally promote an entity framework, there is, sometimes within the same article, also information urging parents to praise effort over a child's product or abilities ("10 ways to motivate your child to learn," n.d.; "Fight Frustration," n.d.; Borba, n.d.). This advice, however, generally lacks background information for parents about how such feedback can influence the way children perceive challenges and set-backs, why mistakes are important for brain development, and how to incorporate incremental

frameworks into daily family life and communication. Most people have heard "practice makes perfect" and believe it on some level, but simply telling someone to practice more is not as effective as showing them *why* and *how* practice can make a difference (Yeager & Walton, 2011). Without a complete understanding of how feedback influences children's thinking, parents are less likely to be able to identify which advice is likely to assist them in raising persistent, challenge-loving children.

In some cases, one strain of parenting advice becomes so popular that it becomes inescapable. Such is the case with the self-esteem movement of the 1990s, which encouraged a great deal of person and product praise. Although the research on child development has since moved away from the movement, its place in parenting practice has yet to fade. Dweck (2002) found that 80% of parents believed that it important to praise a child's abilities. She also found that 85% of parents believed that, to help a child attain a goal, parents should assure them that they possess the talent to achieve it (Dweck, 2006). Likewise, generic statements are still common in parental speech to young children (Gelman, Goetz, Sarnecka, & Flukes, 2008). This type of speech is then reinforced every time one parent hears it used by another.

Similarly, schools also model an emphasis on achievement over effort with high stakes testing and set up entity frameworks of intelligence by labeling some children as "gifted" or "bright." While schools are simply trying to meet the needs of particular learners, applying a "gifted" label to them may be setting them up for underachievement by implying a stable trait (Heyman, 2008). Afraid that failure might indicate that they are undeserving of the gifted label, Heyman argues that these students may hold themselves back by attempting tasks that they know they can master with little effort.

Heyman asserts that, instead of applying a label to students which implies they should be able to achieve great things, talking to them instead about the challenges faced by role models helps them face their own challenges.

Existing Programs for Older Children

Much of the research surrounding entity and incremental beliefs and patterns of response to challenge has surrounded older elementary students, adolescents and college students, thus it is not surprising that most programs for children also focus on these ages. Stanford University's applied research center, Project for Education Research that Scales (PERTS), is striving to bring effective programs to middle and high schools based on current research. They have successfully helped students boost their academic achievement through short computer-based programs that encourage incremental frameworks in students ("PERTS," n.d.). Similarly, Mindset Works is a company that uses the Brainology computer program ("Brainology," n.d.) developed by Carol Dweck and Lisa Blackwell to teach older elementary children and adolescents an incremental framework. They have found that students who are taught how the brain learns and how effort causes it to grow and develop generally boost their academic performance. While this success with adolescents is encouraging, the program relies on students having well-developed concepts of intelligence and academic learning, which preschool children do not yet have.

While the methods used by these programs are not necessarily appropriate for younger children, they can still provide valuable insight into the psychology involved in teaching the material. Yeager & Walton (2011) reviewed several programs similar to Brainology to determine the elements that make them successful for older children and

adolescents. While they did not examine any programs for young children, it is still worth noting the strengths they outlined. First, successful programs focus on the child's perspective of his or her own environment and challenge how they think and feel about their own situations. Second, the student actively participates in the lesson rather than passively receiving a message. Third, the programs are "stealthy" (p. 284) in that the students have no idea that they are being targeted for an intervention or that the program is aimed at improving their school performance. These stealthy messages feel less controlling and minimize student resistance to the message. They also do not cause students to think that they are in need of help or expected to fail. Fourth, the activities are brief, in some cases only five minutes, since longer programs have been shown to be less successful in many cases than shorter ones. The fifth and final element is that these programs are not delivered by teachers or parents, but by strangers who are able to use a "lighter touch," since teachers or parents may unintentionally give students the impression that the students have problems that need to be addressed. Future research may reveal that some of these characteristics are not of value to programs for younger children, but current practitioners might be wise to take Yeager and Walton's analysis into consideration.

Preschool Programs

Some preschool teachers are attempting to adapt successful programs for their young students, as documented by two preschool teachers (Pawlina & Stanford, 2011). In a similar approach to Brainology, Pawlina and Stanford told their students that their brains grow when they try challenging things. They talked to them about resilience and being able to "bounce like a ball" (p. 32) when they encounter a setback. They

attempted to create an atmosphere that would promote their students to embrace effort as a necessary component to learning, and to encourage their students to seek out challenges. They asked the students to generate a list of difficult outdoor activities and encouraged them to try some of them. They also gave their students specific strategies for facing challenges such as brainstorming three possible solutions, choosing the first to try, and evaluating its success. They found that their students were not only highly receptive to these messages and strategies, but that they began to spontaneously transfer their new learning to other domains, such as resolving social conflicts and challenges.

Also highly promising is Master's (2011) work on increasing challenge-seeking and persistence among preschoolers and kindergarteners. Like Pawlina and Stanford, Master used praise for effort and gave children strategies to persist in challenging situations. She also familiarized children with role models who encountered challenge. Master used storybooks to effectively communicate these messages to children. For preschool students, she found that books in which the preschoolers themselves were the characters were the most successful in increasing persistence. She also had children convince a puppet that challenge-seeking and persistence are beneficial, but this activity did not prove to have any impact. This result is somewhat unexpected since, in a study with college students, Aronson et al. (2002) found that having the student teach an incremental framework to a younger pen pal helped the college students adopt such a framework themselves. Perhaps this strategy is not useful with young children, or perhaps Master's puppet was not relevant enough since it appeared only while the children were teaching it, then it went away.

Conclusion

While Master and Pawlina and Stanford are off to a promising start, their work could be made more effective by enlisting parents to reinforce their message at home. Helping parents create a home environment which supports incremental frameworks and mastery-oriented responses to challenge might sufficiently instill these concepts in young children before they enter more challenging school environments as they age. As school places students in more stressful situations that emphasize achievement, children who have had ample practice with a mastery-oriented response and live in an environment in which that is supported may be better able to maintain such a response pattern.

Although there have been several successful attempts at improving challenge-seeking and persistence among both adolescents and young children, there is still work to be done. There is a dearth of programs for families with young children that provide not only activities for the children, but also lessons for their parents. Given the crucial role of parental feedback for young children (Gunderson et al., 2013) and the conflicting advice parents receive, any curriculum aimed at increasing young children's challenge-seeking and persistence might benefit from also including parents.

V. An Overview of *I Can and I Will*

I Can and I Will seeks to encourage young children (four- and five-year-olds) to develop a mastery-oriented response to challenge through whole-family education. While the curriculum was designed and implemented in an informal outdoor playgroup setting, it could be useful as well in some preschools, especially those with significant parent involvement. At a time when children are beginning to display incremental or entity frameworks about traits and abilities and the associated response patterns, positive experiences with mastery-oriented responses and incremental beliefs can potentially lead to greater challenge-seeking and persistence in the years to come (Yeager & Walton, 2011). So that parents can be better partners and guides during these early experiences and throughout their children's lives, parental involvement is a central component of this curriculum. *I Can and I Will* was developed in an attempt to discover whether parents, given practice with feedback strategies and education on how their feedback can affect the way their children relate to challenges, can more consistently provide feedback to their children that will encourage a mastery-oriented response to challenge. Further, can a curriculum aimed at teaching families to view challenges as opportunities to improve their abilities increase challenge-seeking and persistence among four- and five-year-olds?

Goals

I Can and I Will is a curriculum that helps foster a home environment that supports the challenge-seeking and persistence of young children. There are three goals of this curriculum.

Goal 1: Children will display more mastery-oriented responses to challenges. A mastery-oriented response to challenge is characterized by viewing developmentally-appropriate challenges, mistakes, and failures as learning opportunities rather than as threatening situations, attributing failures to insufficient effort or incorrect strategies rather than to insufficient ability, positive affect in the face of challenge, and persistence in challenging situations that a young child could reasonably be expected to handle. Thus, children who are increasingly displaying a mastery-oriented rather than a helpless response pattern will display a greater willingness to attempt tasks which they perceive to be difficult. They will increasingly talk about challenges and set-backs as learning opportunities. They will be more likely to talk about their struggles in terms of their efforts or strategies rather than their lack of ability. Finally, when they encounter a problem or set-back, children will persist more often.

Goal 2: Children will be able to describe how the brain changes through effort. Children who understand how their brains change as they work hard on a task will be able to explain how their brains grow stronger or form connections between neurons when they practice something, work through a problem, or work on a mistake. They will be able to identify past experiences that helped strengthen their brains and identify future opportunities for such growth. When they encounter a challenge, they will be more likely to talk about it in relation to its effect on their brains.

Goal 3: Parents increasingly will provide their children with feedback that supports their children's incremental frameworks and mastery-oriented responses to challenge. Parents will provide more process and nongeneric feedback rather than person, product, or generic feedback. They will provide more feedback that emphasizes

progress rather than speed or accuracy. They will focus less on quick success or ability and will be more likely to discuss problems, failures, and mistakes as normal occurrences and opportunities for growth.

Features

In order to reach the goals of the curriculum, *I Can and I Will* utilizes three main features.

Children examine their own responses to challenge. *I Can and I Will* encourages children to examine their own past responses to challenges and set-backs and how they think and feel about their experiences. Children also set goals for future challenges and practice evaluating their efforts and strategies. They discuss how these challenges affect their brains, imagine new strategies to persist, and come up with mastery-oriented attributions for failures.

Children teach others how to take on challenges and encourage them to persist. By teaching others how the brain changes through effort, how to persist in challenging situations, and how to approach problems with an incremental framework, children reinforce their own learning and that of their peers. In a setting where most of the children know each other and have stable relationships with one another, this feature can help children understand that mistakes and failures are normal and not unique to themselves. Having other children cheer them on through a challenge may make them more likely to persist or associate positive feelings with difficult situations.

Whole family education. Embodied in these activities are opportunities for parents to create a home environment that supports children's early experiences with incremental beliefs and mastery-oriented responses to challenges. Parents learn how to

adjust the feedback they provide their children and engage in activities at home to reinforce their learning as well as to share it with other family members. Even parents who are not directly involved with the curriculum can participate in activities at home that support their children's learning.

Activities

The activities in *I Can and I Will* are designed to help families foster challenge-seeking and persistence in their children. The activities range from a parent-only workshop to lessons for the children to activities for families to share together at home. Below is an overview of the activities.

Parent Workshop. The parent workshop consists of two meeting without children present that last about an hour to an hour and a half. Parents learn about the importance of perseverance, the differences between incremental and entity frameworks and their effects on children's responses to challenges, how the brain learns, and how to adjust their feedback to promote a mastery-oriented response pattern in their children.

Playgroup Activities. Three lessons for four- and five-year-olds provide children with information and practice related to mastery-oriented responses to challenge. First, children learn how their brains learn. This information is reinforced when they teach others about the brain, set goals to strengthen their brains, and discuss their progress. Then they learn why problems and mistakes are wonderful opportunities to strengthen their brains and learn new things. They practice persisting in challenging situations of their choosing and encourage one another to do so. Finally, they learn how to avoid attributing difficulties to the intrinsic traits of a person and help others come up with constructive attributions.

At-Home Activities. Children and parents can continue the conversation about their learning at home and involve other family members with activities that reinforce the concepts throughout the curriculum. Children create a drawing that depicts an activity that strengthened their brains, view videos they created during the whole-group activities and discuss them with their families, and read *New* Shoes, a book about persisting and mastery-oriented responses to a challenge.

For more complete information about these activities and for copies of the materials, please see the Appendix.

VI. Implementation and Revision of *I Can and I Will*

All revisions made to the curriculum during and after the implementation process are reflected in the final version of the curriculum located in the Appendix.

Context

I Can and I Will was implemented in an informal parent-child outdoor playgroup in southern California. The group met weekly at various neighborhood parks in Hilltop, a suburban community located north of a large urban area. As indicated in census data, the community consisted primarily of single family homes and apartments built during the 1950s and 1960s. The median household income was $65,000, and nearly half of all housing units were rented. Most adults in the community had completed high school and at least some college, and almost three-quarters identified as white (U. S. Census Bureau, 2012).

The children in the group ranged in age from infancy to five years old (pre-kindergarten). Each child attended with a parent or guardian and the adult in attendance was almost always the mother. There were usually around ten families at any given playgroup gathering, though there were roughly 20 families consistently active in the group and many more occasional attendees. None of the families in the group had children who were old enough to attend elementary school, so most families brought all of their children to the group. Most children attended with at least one sibling and stayed for two to three hours.

The families joined the group after seeing flyers in Hilltop parks, searching for a playgroup on a social media website, or through word of mouth. The families in the

group lived in and around the Hilltop neighborhood where the group primarily met. The playgroup met primarily on weekday mornings, so all of the mothers in the playgroup either stayed home full-time or had work schedules permitting them to participate in the morning. According to my conversations with them, about half the mothers reported working at least part time and most of the mothers left professional careers or altered their career paths to care for their children. Most of the mothers had at least some college education, though a few never attended college. I learned through conversation that all of the families in the group rented their homes except for one. Given the informal nature of the playgroup, I did not collect information about participant ethnicity/race or socioeconomic status. About a third of the families were long-term residents of the area according to what they told me, while about a quarter had immigrated as adults from Europe or Asia and spoke a language other than English. In addition to any other home language, all mothers and children were fluent in English as I had observed during their interactions.

Because many of the families attended the playgroup regularly, most of the families knew each other fairly well. This did not mean the group was composed of women who were friends and happened to have children the same age. Few families knew each other before joining the group and indicated that they rarely socialized outside of playgroup times unless their children also attended preschool or other classes together. Even so, mothers seemed to be remarkably familiar with each other's lives outside of the playgroup due to the personal conversations that took place during playgroup gatherings. Conversations between mothers at the playgroup generally surrounded such topics as difficulties they were having with their children, concerns

about work, questions about schooling options, and available local resources. Due to the ongoing personal nature of the conversations between mothers, there appeared to be a close communal atmosphere in the group in which even new attendees could participate immediately. Although socialization between families outside of the playgroup may have been rare, families often provided assistance to one another in times of need, according to incidents they described in conversation.

Some of the older children had known each other for several years, but new families joined often. There were occasionally small cliques among the children, but most children played indiscriminately with all other children of similar ages. Younger siblings were often included in play with older children. At other times, younger children played separately from older children.

The playgroup time generally consisted of free play at the playground followed by optional structured activities and more play time. Structured activities ranged from music time, books read aloud, crafts, whole group projects, and obstacle courses. Most children participated in the structured activities, but families would come and go throughout the morning as their schedules dictated. Therefore, children sometimes arrived during or even after a group activity. In such instances, those children still had an opportunity to participate in the activity with their parents or with a couple of other interested children.

Participants

The number of participants for each activity varied depending on which families attended the playgroup on the days of implementation of *I Can and I Will.* Since the content of the activities was geared towards the children who would be transitioning to

kindergarten the following year, only the four- and five-year-old children participated in the activities for this curriculum, though younger children were present and wandered in and out of the activities, occasionally contributing. During playgroup times, the older children participated mostly without parental involvement, though some parents did stand close enough to listen.

Parents who attended the parent workshop included almost all of the mothers of the children who participated in the playgroup activities as well as some other mothers of four- and five-year-olds. These other mothers were from families that had formerly attended the playgroup with their children or who continued to attend with younger children while their four- or five-year-old was in preschool. Those mothers who no longer attended the playgroup were recruited through an email that was sent to former playgroup participants. In addition, four mothers attended the workshop who had children from six to eleven years old. These mothers were from families that were very similar to the playgroup families, with the exception of the ages of their children. They had been recruited through their acquaintance with playgroup mothers who felt the content of the workshop would be of interest to these families.

Parent Workshop

The parent workshop was originally designed to take place during one meeting. After implementation and evaluation, the workshop was split into two parts reflected below. The implementation of the workshop is described in Part 1.

Part 1. I conducted the parent workshop in my home without children present with four separate groups of mothers. Table 1 includes information on the number of mothers at each workshop implementation.

Table 1:

Number of Mothers at Each Parent Workshop Implementation

Implementation	Playgroup Mothers	Non-playgroup mothers of four- and five-year-olds	Non-playgroup mothers of six- to eleven-year-olds
first		3	
second	4		
third	5		
fourth		4	4

The first group consisted of three mothers of four- and five-year-olds who no longer attend the playgroup due to scheduling conflicts. The second and third groups both consisted of mothers from the playgroup whose children were involved in the activities. The final group consisted of more non-playgroup mothers like the first, but some of these mothers had children age six to eleven.

The first and second parent workshops began with the mothers filling out two note cards. On the first, each mother wrote down something that her child does well, and on the other something her child struggles with. By the third workshop I modified this to one notecard on which mothers wrote a time when the child gave up easily or refused to try something they perceived to be difficult. I found that the earlier groups were focusing more on their children's abilities or lack thereof rather than on their persistence, and that was working against my purposes.

I then gave the mothers a handout, which can be found with other samples of material and instruments in the Appendix. The workshop began by explaining that

successful people are not necessarily those who write the best or are the best at math, but instead are those who can be persistent when they need to be. This prompted the mothers to sit forward and listen intently, making comments about their children.

For the first group, I continued through the handout and came next to a four part road-map for how to help children approach any problem. It was here that the mothers became confused, asking questions to help clarify the information and trying to figure out our focus. With the second group, I removed this section entirely. I felt the transition to the next section was awkward, however, so I replaced it for the third and fourth group with information about mindsets that allow children to be successful, explaining which one we would be looking at more thoroughly and why it is a good place to start. This change provided a logical transition to the next section and the mothers did not indicate that they were confused as they had in the first group.

We moved on to the next part of the handout which explained the difference between entity and incremental frameworks. I used the terms “fixed” and “growth mindsets” because those are the terms most often used for a general audience in the literature. I asked the mothers to think about their own beliefs as I read through first the fixed side and then the growth side. I explained that most people hold a combination of fixed and growth mindsets depending on the subject at hand (for example, a fixed mindset regarding art but a growth mindset regarding personal character). I explained the psychology involved in the outcomes that tend to result from the two mindsets. With the second group, I (inadvertently) spent less time ensuring that parents understood the psychology behind the outcomes, an error which became more apparent when they

struggled with subsequent activities. Therefore, I have determined that their understanding of this section is a key element of the workshop.

The next section of the workshop focuses on how the brain builds connections when it works hard on a problem. I gave the first group of mothers several extra facts regarding brains and learning but this only seemed to take up time and detract from my main point, so I removed it from subsequent workshops. I also showed the first group a short video drawing an analogy between building a bridge over a ravine and connecting the synapses in the brain. After receiving feedback over the course of several weeks and hearing very little about the brain, I removed the video component of the workshop since it did not seem to be worth the time. For the second workshop, I moved the brain information earlier in the presentation, hoping it would help parents focus on it more strongly, but it impeded the logical flow, so I switched it back around for the third and fourth groups.

During the first implementation, we then moved on to discuss how parental speech can influence the type of mindset children develop. At this point, the demeanor of the mothers changed as they seemed to be disheartened, admitting that much of their feedback comes from the fixed side. Since I did not want to create emotional distress, I modified this section for each subsequent implementation, finally settling on language that focuses on "third party" feedback rather than "parental" feedback. By taking the focus away from the parents and placing it on imaginary third parties (grandparents, teachers, etc.), the mothers displayed none of the negative feelings of the first group. The modification included examples of feedback children might hear from other sources and time for the mothers to write revised versions of the feedback. Thus,

mothers in later implementations had more practice with modifying feedback while working with less-threatening language.

Finally, I had the mothers use the note cards from the beginning of the workshop to write down feedback that would help encourage a growth mindset in their children. They were eager to share what they wrote and receive feedback from each other. This activity was extremely productive, so I kept it for all of the workshops.

While the mothers were writing their final notecards, I passed out the *New Shoes* books (inadvertently leaving out the instructions as described below in "At-Home Activities" for the second workshop). For the playgroup mothers, I explained the content of the playgroup activities and we reviewed how they could help support their children's learning at home. Had I done this before the first playgroup activity instead of after it, mothers would have been able to speak to their children about their brains when the experience was still fresh in their children's minds and help them with their chosen challenging activities sooner. In the current version of the curriculum, I revised the timing of the parent workshop to come at the beginning of *I Can and I Will* for this reason.

Part 2. In the weeks that followed the first parent workshop, most mothers mentioned that they were struggling to incorporate all of the material on a day-to-day basis with their children. They indicated a need for more practice to be able to give the type of feedback they now wanted to provide. In addition, few were able to apply the material to social situations. For this reason, I revised the workshop to take place in two parts which should be spaced two to four weeks apart.

Part 2 of the revised workshop in the Appendix consists of a discussion about parents' successes and struggles after the first workshop as well as practice with applying the material to social conflicts. During the discussion, parents help each other devise ways to tackle struggles they have been having with the material and work together to clear up misunderstandings. After the discussion, parents learn how to attribute the actions of others to causes other than fixed traits or personalities. When a child is involved in a social conflict, rather than stating that the other child is mean or not nice, parents learn to help their children view the conflict as a single incident with its own complex causes. This addition to the parent workshop replaces Playgroup Activity 3 (see below).

Playgroup Activity 1 – Your Learning Brain

Attendance at this gathering included almost all of the regular four- and five-year-old children in the playgroup, including a boy who had only attended once before and a girl who had not attended in several months. All the children would attend kindergarten in the coming Fall except for one who was one month too young. Altogether, there were five boys and six girls. One of these boys arrived a few minutes into the activity and another elected not to participate.

I initially gathered the children from the playground and tried to get them excited by saying "come on over to talk about brains!" As we were waiting for the last few children to decide if they were going to participate, we sang "Head, Shoulders, Knees, and Toes" both as a way of getting them actively involved and also to prompt them to think about their bodies. The children were enthusiastic in their singing and participation.

I then asked children to keep their hands on their heads and asked them what is inside there. One child answered “skull” and several others said “brain.” When I asked them what their brains are for, children responded with “thinking,” “understanding,” and “helping you do stuff.” Some children remained silent but remained focused on the discussion.

I passed around a toy brain and explained that their brains look similar and are about the same size, but are squishier. Some children were initially reluctant to touch the brain, but after I showed them that it was not delicate like our brains and was instead quite hard, all children eventually decided to take a turn holding it. While they were taking turns with the brain, I talked about some things that their brains could do (control their arms, remember what they had for breakfast, control when they are happy or sad). Some children were too distracted by the brain to listen, so this discussion should take place after children are finished holding the brain. I was concerned that those who had finished with the brain might become disinterested if I did not continue swiftly, but a continued discussion about the look and feel of the brain would almost certainly have been a better choice. We then used our brains to move our arms and legs, jump, and wiggle.

Next, I showed the children a poster of what the neural network resembles in their brains. I had drawn the poster based on scientific images, but I emphasized the connections over anatomical accuracy in my own drawing. I wanted to be sure the pathways between the neurons were the focus. I was not sure if children at this age would be able to grasp the concept of neurons in their brains and the connections between them, but I decided that it would be better to explain things in slightly too

much detail rather than to oversimplify and risk missing an opportunity to make a strong impact. Throughout the lesson and afterwards, they proved to grasp more than I had anticipated, using terms such as “neurons” and “connections” and “growing stronger” to discuss novel examples and ideas.

I explained that whenever we do anything, our brains send information between neurons to tell us how to do it. I told them that when they were babies, their brains did not have all of the connections between neurons that they have now. They had to build those connections through hard work and practice. I used the example of grabbing a toy. When they were tiny babies, they were unable to see a toy, reach for it, and grasp their hands around it. I showed them how babies often miss the toys in their early attempts. One child said his little brother did that, and others said they remembered their younger siblings doing the same. I told them they had to practice many, many times before they were finally able to grab a toy, and that each time they practiced, they were helping to build a connection between neurons in their brains. Now that they have a strong connection in their brains, they are able to easily reach out and grab something in front of them. I let them try this action and they agreed that it was now easy for them. Children’s participation and comments (“Yeah, I can do that.” “That’s not hard for us now.”) indicated that they understood the example. I asked them if tiny babies can clap their hands and most children answered “no.” When I asked how they had all learned to do that, almost all children responded “with practice” or “by connecting our neurons,” demonstrating that they had learned the basic information from the lesson.

I told children that the harder something is, the more they have to practice and work hard to connect their neurons. I asked them to think about things that are still not

easy for them but that they can get better at with practice. Each child thought of something (“riding my scooter,” “reading,” “writing”) and we talked about how even when they try to do these things and fail, they are still building connections in their brains.

Next we pretended to make ourselves really small by grabbing hands and saying magic words (“holding hands, we want to be… really small on the count of three… take a trip into a brain… help it learn to do hard things… 1, 2, 3!”). Some children giggled while others looked at me with confused, yet amused, expressions. This short activity provided children with a chance to move around and be silly before sitting and listening again. When we were sufficiently tiny that even their parents could not see us, we went to sit inside a brain, which was a pink plastic table cloth. When the children were all seated, I showed them two toy neurons that were each a little smaller than a foot. I explained that these neurons wanted to talk to each other but were unable to send information to each other. When I asked the children why they could not send information, a couple of them answered that they did not have a connection between them, suggesting that these children remembered the poster drawing.

I explained that we were going to help the brain build a connection between these neurons by working on something difficult, namely patting our heads while rubbing our tummies. All children instantly attempted this activity, but none were successful.

The children took turns standing up and trying to perform the action. Other children took turns suggesting new strategies that the current volunteer could try (“do it really fast,” “close your eyes”). After each child made an attempt, I connected the

neurons by wrapping a piece of thread around them. I had originally intended for the children to perform this task by wrapping the thread around the neurons once at the end of their turn, but the weather was especially windy that day and the action proved too difficult for them. Nevertheless, I could see they wanted a chance to physically interact with the neurons and form the connection after their hard work, and I wish I had rigged the neurons up in a stable manner to accommodate this piece. Even without this element, however, watching the connection between the neurons grow stronger with each thread after each volunteer was a powerful metaphor, and children became excited to see it happen. We continually talked about how, even though we had not yet learned how to perform the movement since none of the children were successful, we were still growing the connection and making the brain's connections stronger.

Finally, I asked children to remember the thing that is still difficult for them. I asked them how they could grow the connections in their brains to make the task easier, and they almost all instantly shouted "practice" or "work hard" or "keep trying." I told them to work on growing those connections this week by practicing and to draw a picture about their experience to bring the following week.

As the children played on the playground after the activity, I approached them individually or in pairs and told them that their younger siblings or other young children did not know how the brain learns. I asked them if they would help make a video to teach these children about the process so they could watch it when they are ready. One boy chose not to participate in the video, but the others all explained how the brain grows connections between neurons when we practice or work hard and, once those connections are formed, the activity becomes easier. Some children needed more

prompting than others, but almost all demonstrated a fairly detailed understanding of the process. One girl seemed to hold only a superficial understanding, but it is possible she simply did not explain her knowledge. She went home immediately after making the video, so I did not have an opportunity to assess her understanding another way. Many children used examples of activities that one would need to work hard on in order to make brain connections and display mastery. The video helped to assess their understanding, to reinforce their learning that day, to have something to play back to them on future occasions to help them recall their learning, and to help them bring their learning home to their families.

The following week, six children brought the drawings I had asked for (three of the original eleven were not present). I asked children to explain their drawings to me. Some talked about how they worked hard on a task and their brains made connections as they practiced. Others did not discuss their drawings. Because I had not given the parent workshop until just before children were to bring in their drawings, parents were unaware of the activities and their purpose after the children learned about their brains. Parents were confused about or unaware of the drawing request. In retrospect, I needed to do the parent workshop before the first playgroup activity so that parents could continue the conversation at home with their children. Since most had been out of earshot of the lesson, few understood the lesson or the intent of the drawing. I believe that the drawing would have been a more powerful tool had I communicated with the parents more effectively. Therefore, in the current version of the curriculum, explaining the drawing to parents is part of the parent workshop.

Playgroup Activity 2 – Mistakes, Problems, and Challenges

First Implementation. Before children arrived, I taped their drawings on a poster board and displayed them along with the previous poster of the neural network in order to help children recall the information from two weeks before. I would have preferred to do this activity the week after the first one, but we were forced to postpone because of a holiday. It is difficult to determine how disruptive this break was since many children were sick and attendance for the second activity was sparse. There were only two girls and two boys. There was one additional boy who had not attended the first activity, but he quickly became uninterested and wandered off to play. I made an attempt to summarize the previous activity for him, but ultimately it proved too abstract to keep his interest.

This time I gathered the children from the playground by telling them I had a project for them. I had them quickly summarize their learning from the previous activity, which was simple for each of them to do. I showed them the drawings they had done. The two children who had not done drawings were present at this activity and they were just as interested in the drawings as the other children were.

I asked them if they had ever made a mistake. They all said they had. I told them I had made a mistake and then did not know how to fix it. They sat very still and listened intently when I spoke about my mistake. In the middle of the poster with their drawings was my drawing with abstract, unrecognizable shapes. I told them I had attempted my drawing but messed up and it did not turn out at all like I had wanted it to. I told them I was frustrated and did not know how to proceed until my son suggested I look in a book to help me. I asked if any of them had read any books about how to deal

with mistakes or problems. Two of them mentioned reading *New Shoes* and explained how the child in the book kept practicing and trying new strategies over a long time period. For more discussion on *New Shoes*, see the section on "At-Home Activities" below.

I asked them to help me come up with a few ways I could address my problem. They suggested that I either get another paper, turn this paper over, or try to fix the drawing. We went through the first two scenarios and determined that neither would work since I did not have another paper with me and I had taped it too tightly to turn it over. They then suggested that I get another piece of paper when I get home and start again. I agreed I would follow that suggestion at home and thanked them for their help. I was worried the children might be annoyed at having to help me solve such a simple problem, and initially their exasperated sounds and hand movements indicated that they were. Yet once they started giving me suggestions, they devoted some thought and care to the issue and were pleased that they could help me resolve it.

We talked about how problems and mistakes are excellent opportunities to grow connections in our brains and that they had helped me grow connections by offering me different strategies with my drawing. I told them that I wanted to take a video of them actually growing brain connections today. I asked them what could make their brain connections grow and they did not respond. One finally said "it would have to be something hard." We revisited our discussion about how things that were difficult for them when they were younger but became easier as they grew and practiced already had strong brain connections to send information between neurons. Therefore they would want to try something that they had not yet mastered or figure out a new way to do

something. We talked about playground activities that fit this description but were not dangerous. Unfortunately, some toddlers decided to come interact with the older children at this point and their attention began to wander. I had hoped they would take a few minutes to generate some ideas of what they could try, but this step ended up hurried because of the distractions. I did manage to remind them to encourage each other and help each other come up with new strategies before they ran off to find their challenges. Ultimately, without having this discussion more thoroughly, they ended up slightly confused about what they were supposed to be doing.

Two children attempted to complete the monkey bars while two others decided to teach a younger sibling to walk. I followed the monkey bar pair to begin with. They were remarkably persistent without gaining any progress. They encouraged each other but did not offer each other strategies. They seemed to not be able to generate any strategies to try, but were willing to try any that I suggested. I left them to keep working while I tracked down the other pair.

Predictably, teaching a younger sibling to walk came with too many logistical challenges. The younger sibling was neither interested nor developmentally ready to learn to walk at that moment. I had hoped to find them engaged in a different challenge, but one of the children had decided by this point not to participate. She had been the most distracted during our discussion, so it is not surprising that she seemed confused and disinterested. The other child tried a few activities that all proved to be too easy for him before deciding to dig all of the sand away from a pole that was supporting the climbing structure. I made a video of him starting this activity and then went to check on the children on the other children.

The pair on the monkey bars had still made no progress but was showing no signs of giving up. This offered an excellent opportunity to engage in a discussion with them about why they were failing to progress. First they insisted they just needed to practice more, but we talked about how the larger of the two could get to the second bar but the smaller could only reach the first. They determined that size and strength matter a great deal in this type of activity, and perhaps they need to be a bit bigger before their practice can pay off. They explained this reasoning to one another a few more times, decided they would try again in a few months, then went with me to check on the other boy.

Not surprisingly, the other boy had not managed to get the post dug out. The four of us discussed possible explanations for his lack of success. The two children from the monkey bars insisted that it would take the boy too long to dig out the post – possibly until tomorrow. The boy argued that he could do it before then – maybe by this evening. The other two children ran off as the first boy contemplated whether or not he should continue. Just as he decided that he did not have time to complete his task and that he should go play instead, the other two returned with shovels to help speed up the process. They encouraged the boy to stay and dig with them since they could probably accomplish the task if they worked together, but the boy's mind was already made up to abandon his endeavor. Nevertheless, the other two children worked extremely hard to complete the task, enlisting the help of four younger children. The original boy came back periodically to survey the progress and became excited when he saw how deep the hole had become. After recording several snippets of video, I left the children to work on their challenge and checked in periodically.

After nearly ten minutes of digging, their hole looked less deep than it had before. I asked them what had happened and they explained that one of the younger children kept refilling the hole and they couldn't convince her to stop. We talked about how sometimes things that we can't control happen to our projects and we discussed their options. They determined that the most important thing would be to get her to stop filling in the hole, but since it appeared that was not possible, they probably needed some kind of machine to help them dig the dirt fast enough. Satisfied with this analysis, they then ran off to play other things.

I had been concerned that they might not be able to come up with challenging activities, especially since that conversation was cut short, but I was pleased to see three of them devote so much time and effort to the digging project. I had hoped that telling them I would be making a video would motivate them, especially after seeing the results of the last one. Ultimately, the video process was logistically difficult because it cast me in the role of observer instead of participant, and they seemed more interested in engaging with me about their endeavors. The video part of this activity ended up being more of a hindrance than a help, so I planned to remove it before implementing with the second group of children.

Second Implementation. Because attendance at the first gathering was sparse, I implemented this activity a second time with four children who had attended the first playgroup activity about the brain but had missed the first implementation of the present activity. Instead of meeting at a park, I gathered the children and their mothers for an informal meeting at my house. Since we sometimes meet there on rainy days, all of the children had been there before and were comfortable in the surrounding. Even though

the children felt at-ease there, they still did not behave exactly the same way they do when we meet at a park. They behaved more like guests than like children on neutral territory. Children who are normally outspoken had to be coaxed into sharing their ideas.

Since over six weeks had elapsed since the children had participated in the brain activity, I did more review of that content with this group than I had during the first implementation. The result is that the children ended up sitting longer than I had anticipated and began to get antsy around the time I was asking them if they had read any books about solving problems. Notably, none of the children mentioned *New Shoes* in this conversation. One did mention it about 45 minutes later while attempting a challenge.

Even though I gave them more time to think about and discuss challenge ideas, the second group of children had a much harder time coming up with a task to work on together. They all worked hard at finding challenges but failed to agree to try one another's. Instead they all started working on their own challenges. One of the children became frustrated that no one else would try what he wanted to try. Finally, they ended up trying tricks on the trampoline and making those tricks increasingly harder. They also worked on drawing a chalk design all the way across a wall. They did not encourage each other or help each other. Because of these difficulties, I revised the curriculum to include a stipulation that all children must choose another person's challenge to try and agree which challenge would be attempted together first.

The discussion about coming up with several possible strategies to deal with a problem was fruitful with both groups of children. Almost every child suggested a

strategy. My suggestion, however, of coming up with three possible strategies and choosing one to try first was ignored by all children both during the discussion and during the activity. It seemed more structured than necessary, so I removed it in the current version of the curriculum. Instead, individual discussions with children during their challenge activities proved more useful to discuss how they selected and evaluated strategies and attributed setbacks.

Some of the children wanted to show off their progress so I offered to make a video. Some agreed readily and others declined. The video seemed to be a motivator for some children when used this way, so the current version of the curriculum includes this option.

Third Implementation. I again gathered a small group of four children (two boys and two girls) who had been unable to attend the first two implementations. In order to avoid some of the difficulties from the setting of the second implementation, we met at a park. Before the gathering, I encouraged parents to read *New Shoes* again with their children, which resulted in a much more fruitful discussion about the book. Similarly, I streamlined the review portion of the lesson and used the physical representations of the neurons to do much of the talking. This time, I added an emphasis on dealing with the sadness and frustration involved in problems and mistakes. Using the neurons to help me tell the story, I encouraged the children to acknowledge and name their feelings, then "switch their brains to action mode" to make a plan. They enjoyed practicing this switch and I observed two of them practicing it on the playground while working on their challenges.

With the added time to choose a challenge before setting off, children in this group had little trouble getting started with their challenges and continuing them. They remained engaged with their challenges for much longer than the children in the first two implementations, indicating that the revisions were appropriate. Like the children in the first two implementations, they were eagerly engaged in discussions about their strategies and difficulties.

Unfortunately, my camera was out of recording space so we could not make videos for this implementation – something that the children were disappointed about.

Playgroup Activity 3 – Good and Bad and Getting Along

Due to rainy weather, the playgroup met at the home of one of the families for this activity. Everyone was located in the open living area which was comprised of a room with many toys and a smaller sitting area with books and a basketball hoop. The children were excited by all of the new toys but engaged in numerous conflicts regarding whose turn it was with which toy.

While the younger children continued to play, I gathered the older children in the small sitting area. Initially one boy wanted to play basketball but I told him he needed to wait until we were finished. The children crowded onto the sofa, two girls still clutching toys. The children were squirmy and preoccupied by their plans for playing with the toys. There were four boys and three girls present, all of whom had attended previous activities.

I first spoke to them about good characters and bad characters in stories, books, and movies. Two of the children participated in the discussion, another continued to focus on the trains in the girls hands, three others listened but did not participate much,

and the boy who had chosen not to participate in the first activity again walked off. Eventually all of the children spoke about how real people are not simply good or bad, but that everyone can do bad things. They all sat quietly and listened intently as I recounted a bad decision I had made at preschool when I was their age. They were adamant that I was not a bad person even though I had made that decision.

I read them the first few pages of the book *One* (Otoshi, 2008) about a red color that picks on the blue color. We talked about reasons why the red color might be acting that way, but the children were unable to generate explanations. I was not sure if their lack of response was due to distraction or due to a true struggle with the content, so I thought we might revisit the question after a puppet show. Unfortunately, things deteriorated and we never returned to the topic. I had initially planned to have them come up with possible explanations for Red's behavior in pairs, but they were so squirmy that I moved on to the puppet show instead, hoping they would become more engaged.

Unfortunately, the puppet show, involving one puppet who criticized another's block building, only served to hasten the deterioration of the activity. I had the puppets speaking directly to the children and asking them for advice and help, but one boy was responding loudly and aggressively and the other children first became silly and then frustrated with their lack of ability to contribute. The children did eventually discover that the criticizing puppet had wanted to share the blocks and they helped the puppets work out their conflict. The noise of the younger children playing nearby was too much to combat, so I stopped the activity there and sent them back to play. As soon as the

children returned to the play area, tensions rose once again and their conflicts over toys continued to escalate.

The conditions for this activity were far from ideal. Children in the playgroup are accustomed to playing outside during playgroup gatherings. It rains so rarely in Southern California that a move to an indoor location is highly unusual and often results in children displaying unusually restless behavior. Additionally, the presences of so many unfamiliar toys provided an irresistible distraction for the children. Even in the playgroup's usual outdoor setting, however, the content might be too much of a stretch from the other, more concrete ideas in the previous activities. I had hoped that their practice with attributing their failures to situational causes rather than inherent abilities would carry over to social problems. It is possible that their learning did transfer or that they are capable of making that connection, but the activity as it is currently designed does little to aid in the process.

I considered whether or not to retry the content in a new activity, but I concluded that the risk to over-teach the content is was high. Yeager and Walton (2011) are clear that this type of content is most effective when it is delivered in a "stealthy" manner, and to revisit it in another planned activity would run the risk of making children feel manipulated by the ideas, possibly doing more harm than good. The children appeared to be growing fatigued by the content already, and it is possible that three activities on the subject is simply too many. Instead of revising this activity, I instead added the second parent workshop to better support parents to tackle these issues individually with their children as they arise.

At-Home Activities

In order to help families create an environment that supports challenge-seeking and persistence, *I Can and I Will* includes several family activities. Children share their learning with their parents through a video they make about how brains learn. During the implementation of the first playgroup activity, I compiled all of the children's explanations about the brain into one video and sent the link to all of the families via email (a common method of communication in the playgroup). All but two of the families reported watching it and discussing it with their children, sometimes multiple times or with more than one adult. I sent the video to the families after the parent workshop, so parents understood the content and how to speak to their children about it.

The pictures drawn by the children about their brains growing connections while they worked on something difficult would have been more successful tools of family discussion had the parent attended the parent workshop before the playgroup brain activity. Instead, parents did not attend the workshop until four or five days later. Ultimately, most children were able to have discussions and complete the drawing, but the timing has been revised in the current version of the curriculum.

The *New Shoes* book was sent home with mothers at the end of the workshop. All mothers read the book with their children but reported mixed reactions. With some mothers I emphasized that they should be covert about the origin of the book, not mentioning that I had written it or given it to them, so the children would not feel that we were using the book to manipulate them. Instead, I told these mothers to allow the book to act as a way for them to discuss the content surrounding a third party instead of having a direct conversation with their children about their own persistence. The

mothers that did not receive these instructions reported more resistance from their children surrounding the book. Therefore, giving explicit instructions to parents about how to read the book and have a non-personal discussion with their children needs to be a priority when distributing the material, and this information is included in the current version of this activity.

VII. Evaluation

In order to evaluate the goals of the study, six sources of data were used. Data sources included observational field notes, questionnaires and interviews with mothers, observations of children's responses to challenges posed to them, and informal interviews and conferences with children. The source of data used to evaluate each goal is displayed on Table 2.

Table 2:

Data Collection Strategies by Goal

	Goal		
Data Collection Strategy	1. Parents increasingly will provide their children with feedback that supports their children's incremental frameworks and mastery-oriented responses to challenge.	2. Children will be able to describe how the brain changes through effort.	3. Children will display more mastery-oriented responses to challenges and set-backs.
Field notes	X	X	X
Parent Questionnaires	X	X	X
Parent Interviews	X	X	X
Challenge opportunities			X
Video interviews with children		X	
Drawing conferences with children		X	

Evaluation Strategies

Field notes. During the parent workshops and playgroup activities, I wrote brief pen and paper notes about the words and actions of both mothers and children. Immediately following the activity, I used those brief notes to write an extensive account of what took place and what was said. These accounts include conversations held by mothers and children. They also include mothers' and children's reactions to what took place. These accounts provide a rich source of information regarding how participants used the ideas from the curriculum in their interactions with one another and in how they proceeded with playgroup activities.

Parent Questionnaires. Over the course of one month after the parent workshop, I used an online survey sent to all non-playgroup parents (n=11). The questions covered the interactions between parents and children, children's responses to challenges, mothers' thoughts about their children's responses to challenge, and conversations between mothers and others.

All questionnaires included the following three questions:

- Have you thought about the content of the parent workshop in relation to any interactions you have had with your child over the past few days? Please explain.
- Describe some situations when you have provided feedback to your child recently.
- How has your child been responding to challenges recently?

In addition, the first, third, and fifth questionnaires included the following three questions:

- Have you or your child talked about the learning process of the brain? Please explain
- Have you discussed the content of the parent workshop with your spouse or someone else? Please explain.

- Have you read *New Shoes* with your child? If so, please describe the interaction.

All eleven non-playgroup participants completed the first four questionnaires, and nine of them completed the final questionnaire as well. The playgroup mothers were also sent the initial questionnaire, but with only a 20% response rate, I did not continue this form of data collection for this subgroup. Many of the playgroup mothers indicated that they found it easier to speak to me in person since they saw me weekly.

Nineteen of the mothers who attended the parent workshop (both playgroup and non-playgroup mothers) rated their children's typical pattern of response to challenge on a five-point scale with 1 being helpless and 5 being mastery-oriented. These mothers performed the same rating again one or two months later.

Informal and semi-structured interviews with mothers. Eight of the nine playgroup mothers took part in weekly informal interviews throughout the curriculum and for the month following. These consisted of conversations during playgroup, emails, and text messages, and many of these were initiated by the mothers when they felt they had something interesting to share. In addition, five playgroup mothers and three non-playgroup mothers participated in semi-structured interviews that covered the same topics as the questionnaires, but in greater depth.

Challenge opportunities. Challenge opportunities are times when I offered the children the chance to take on a challenge or persist in a challenge and then observed their responses. Challenges involved games such as a bean bag toss, music and movement activities, crafts, and sports. Whenever I had the chance, I gave them these opportunities individually, in pairs, and in groups, sometimes offering them multiple

challenge opportunities during one activity. The informal nature of playgroup gatherings dictated the frequency and conditions of these challenge opportunities. I began offering them these opportunities before implementing the curriculum, throughout implementation, and one week post-implementation. Sometimes I was explicit in naming the activity as "a challenge" or "something challenging." At other times I asked them if they wanted to do things the "easier way" or the "harder way." And yet other times I simply suggested something that I believed they would perceive as challenging without explicitly labeling the task as a challenge.

Video interviews with children. During the playgroup, children were interviewed to record a video explaining how the brain grows and changes when it encounters a problem or challenge. While these videos were created primarily as a means of learning for the children, the interview process provided useful data for evaluation as well.

Drawing conferences with children. Children were asked to create drawings at home depicting how they made their brains stronger by working hard on a challenge and explain them to me when they returned them. Like the videos, although the purpose of the drawings was to help children learn about the brain, children's comments during our brief drawing conferences provided a source of data.

Analysis of Data

Interviews, questionnaires, field notes, and conferences were organized and separated according to goals. They were coded into categories which emerged through a grounded approach and checked using a constant comparative method.

Evaluation of Goals

Goal 1. Parents increasingly will provide their children with feedback that supports their children's incremental frameworks and mastery-oriented responses to challenge. Questionnaires and interviews with nineteen mothers revealed mothers' self-evaluation of their feedback patterns. Mothers were asked how they provided feedback to their children during their children's recent successes and failures. They were also asked how they spoke to their children about success, failure, traits, and abilities in general. Field notes captured how mothers spoke to children during playgroup times.

Finding 1: Mothers were able to connect the feedback their children receive with the frameworks they may develop.

Mothers' responses in questionnaires and interviews after the workshop indicate that they were focused on promoting mastery-oriented responses to challenge by fostering incremental frameworks in their children. To do this, they reported interactions suggesting that they were adjusting their feedback to focus on process, effort, practice, and nongeneric categories. For example, when asked about the discussions they had engaged in with their children in the days following the workshop, mothers said things like "I am trying not to praise his intelligence," "I'm pointing out details from his art," and "I'm trying to show her the progress she has made through hard work." These statements indicated that the mothers understood the types of feedback that can help promote incremental frameworks.

Finding 2: Mothers valued the cultivation of incremental frameworks and mastery-oriented responses to challenge in their children.

All of the mothers in the study indicated that they wanted to cultivate a mastery-oriented response pattern in their children and placed a high value on doing so. Discussions prior to the parent workshop frequently centered around mothers' feelings of helplessness when their children gave up quickly or became easily frustrated with a task. One mother indicated that she noticed that her children "frequently fail to try." These discussions grew more urgent as the mothers began to look ahead to kindergarten the following year. For example, in speaking about her daughter, one mother said "I see her freak out when a drawing doesn't work out the way she wants and wonder just how she'll ever manage 'real' setbacks in a school environment." It is not surprising, then, that only two mothers declined the invitation to participate in the parent workshop, and all but one attendee participated in questionnaires or interviews after the workshop chronicling their feedback to their children.

Mothers were eager to incorporate changes to their feedback and began providing examples of their efforts, in most cases, the following day after the workshop. A common theme in the informal and semi-structured interviews was the sense of empowerment the mothers had gained in learning how to help their children confront difficulty, especially with the transition to kindergarten in the near future. One mother, in explaining that she now felt she could better help her son through school, said that she was relieved that she would not have to tell him that he "got the bad-at-math gene." Mothers repeatedly indicated that they were relieved to have tools to help their children through the upcoming school transition.

Finding 3: Mothers were willing to try to adjust their feedback to promote their children's development of incremental frameworks and were generally able to do so.

All of the mothers who participated in the parent workshop indicated, both verbally at the time of the workshop and in questionnaires and informal interviews in the days and weeks that followed, that they were taking steps to align their feedback patterns to promote incremental frameworks in their children. Five indicated that they felt that they need only make small changes, and six expressed that they wanted to make more extensive changes in the feedback they provide to their children. The remaining eight expressed that there were several phrases or types of feedback that they routinely gave to their children that they wished to adjust, but that the rest of their feedback was already aligned with what they had learned in the parent workshop.

In questionnaires and interviews during the first week after the parent workshop, all mothers spoke about types of feedback that they would like to focus on changing, although they were never explicitly asked to do so. Their comments can be grouped into eight categories displayed on Table 3.

Almost all mothers indicated that they felt they needed to focus on providing feedback that emphasizes effort, strategies, and learning while only about a third of the mothers felt they frequently used generic language.

Table 3:

Types of Feedback Mothers Indicated They Wanted to Change

Type of Feedback	Percent
Discuss effort rather than ease	95%
Discuss strategies rather than accuracy	79%
Emphasize learning rather than speed	79%
Conveying optimism rather than a sense of defeat	63%
Focus on process rather than talent	53%
Normalizing failure rather than emphasizing success	42%
Focus on the process rather than the product	42%
Discuss specific instances or context rather than give generic labels	32%

In the days and weeks that followed the workshop, all mothers were able to give examples of times they employed concepts from the workshop to alter their feedback patterns. One mother reported that she overheard her daughter tell her younger sibling how smart she is and the mother was able to interject and rephrase the statement to emphasize a history of practice. Most mothers mentioned that they were becoming what one mother described as "more process-oriented" and spending more time describing their children's actions rather than congratulating them on the accomplishments. Eight mothers reported adding "yet" on the end of their children's statements about their abilities: "I can't do it" became "I can't do it *yet*" in these households. It is possible that more mothers were employing this technique but did not mention it. Eleven mothers

described using themselves as examples to explain that everyone makes mistakes, pointing out their own errors and strategies they used to learn from failures.

One mother described an interaction with her daughter who had insisted she would be able to tie her shoes in just one try. The mother reported:

"I told her that's probably not true, but more importantly, that it's actually better if it takes her longer to learn because she'll learn it better if it takes more tries to figure it out. This really threw her for a loop. I think she was expecting me to congratulate her for being such a fast study or something. A good learning experience for her in a lot of ways. And for me too." (Questionnaire, February 16, 2014)

Several mothers indicated that the way they talked about abilities had always been consistent with promoting incremental frameworks, but other mothers reported trying to work on a change. One mother described how she "used to say that some kids are better at things than others. People are good at different things, so deal with it." Now she explains that "no one starts out good."

Although most parents indicated that they had only had opportunities to provide feedback about academic, artistic, and athletic activities, three mothers reported promoting incremental frameworks in social situations as well. Those that did spoke about helping their children attribute social conflict to the specific context rather than to the innate qualities of either party. For example, when one boy spoke about a "bad" classmate, his mother helped him determine that the classmate is not always bad, but sometimes does not behave appropriately during class. The child was able to remember other instances when the classmate actually helped others and made activities more enjoyable for everyone.

When asked if they had applied the content of the parent workshop to discussions with their children about social situations, about half of the mothers who had not done so indicated that the opportunity had not come up, while the other half stated that they were not sure how the content of the parent workshop was relevant to the social domain. Each implementation of the parent workshop included a detailed discussion on the topic, but a large proportion of mothers could not recollect it. When reminded of the social applications, almost all mothers could recall the information, but they all indicated that they were still confused about how to discuss it with their children. It is possible that the mothers were overwhelmed by the content of the parent workshop, thus the revised workshop includes a second meeting to focus more on social applications to provide mothers with additional practice and discussion.

Three non-playgroup mothers, over the course of the month that followed the parent workshop, continually indicated that they were struggling to provide the type of feedback that promotes incremental frameworks and mastery-oriented responses to challenge. At the time of the parent workshop, these mothers all indicated little of their feedback was already aligned with the types presented in the workshop. They all spoke about being raised by parents who used a great deal of person feedback, feedback about speed and accuracy, and generic language, and they reported using this type of feedback with their own children on a daily basis. They were among the most vocal in stating that they wanted to change the types of feedback that they give their children to help their children possibly avoid some of the negative feelings they grew up with – feelings that they argued might have been avoided if they had believed that intelligence and talent are malleable. Their responses on questionnaires indicated that they understood the

types of feedback they wanted to give, but struggled to use the words they wanted to use. For example, three weeks after the parent workshop, one mother stated "I kept praising *him* instead of his actions *all day* today," and another wrote "I have noticed how often I describe something I'm going to do as 'quick.' I have to *stop*!" Unlike the other mothers in the study, these three mothers never indicated that they had been able to consistently give the types of feedback presented in the parent workshop, and their responses to questionnaires gradually became shorter. Two of these mothers did not respond to the final questionnaire and all three failed to respond to interview requests.

In contrast, three playgroup mothers expressed that they had experienced similar types of feedback from their parents and grew up believing that intelligence and talent are fixed. At the time of the parent workshop, they reported that they routinely provided person and generic feedback and feedback which emphasized speed and accuracy. These three playgroup mothers also reported struggling to adjust their feedback in the two weeks following the parent workshop. In the third and fourth week after the parent workshop, these mothers no longer reported times when they struggled to provide feedback aligned with the workshop. Instead, they provided numerous examples of providing process and nongeneric feedback as well as feedback that celebrated struggle and failure. In contrast to the non-playgroup mothers, these playgroup mothers had the benefit of continued support through interactions with other mothers who were conscious of their feedback patterns, observing the playgroup activities, and engaging in the at-home activities with their children. Thus, it is possible that parents who grew up with stronger entity beliefs or have a history of giving more person and generic feedback and feedback that focuses on speed and accuracy need a greater degree of

support than other parents. Without this support, they stand a greater chance of falling back on their old patterns.

Finding 4: Mothers found adjusting feedback to be very difficult but easier with practice.

More than three quarters of the mothers indicated that they wished to change their feedback patterns regarding ease, accuracy, and speed, and only one third indicated that they wanted to focus on using nongeneric language (Table 3). Over the course of the next month, mothers routinely indicated that they were able to change their habits of praising ease, accuracy, and speed, yet those who wanted to use nongeneric language continued to struggle to do so. Ultimately, only three of the six mothers who wanted to learn to use nongeneric feedback felt they were able to make the change. The three mothers who were able to change that particular feedback pattern were all playgroup mothers, while the other three were non-playgroup mothers who attended the parent workshop only and did not have access to other support through the curriculum.

All mothers, even those that indicated their feedback was already largely aligned with the ideas in the parent workshop, indicated that they struggled to make the changes that they wanted to make during the first week after the parent workshop. Their questionnaire and interview responses commonly contained statements such as "I'm really working on talking about the activity and not praising *him*," and "I have noticed how often I describe something he did as 'quick' or congratulate him for doing something on his first try."

In questionnaires and informal and semi-structured interviews over the month that followed, sixteen of the nineteen mothers spoke less about the struggle to change and more about the positive changes they had been making in their homes. They made statements such as “it feels a little easier every day” and “I almost remarked about how quick he was but I stopped myself.” Five of the mothers indicated that they had been working with their spouses to help one another change their feedback patterns. One mother reported that when she or her spouse was struggling with feedback, the other would simply say “grow it” as a reminder to provide feedback that creates a “growth mindset” or incremental framework. Similarly, another mother said that she and her spouse would say “red or green?” – a reference to the handout from the parent workshop that showed an entity framework in a red column and an incremental framework in a green column.

Field notes from playgroup gatherings also revealed that the mothers continued to practice with feedback patterns. Mothers would sometimes begin to speak, stop and collect their thoughts, and then proceed with the type of feedback they wanted to give. On three occasions, when mothers were providing feedback related to speed, accuracy or talent, other mothers stepped in to help rephrase the feedback. “Good swinging” was adjusted to “you were able to swing a lot longer this time!” When one mother grew exasperated at her child’s frustration with an art project, I observed another mother ask the child “how can you help your brain make connections here?” When a child was upset that he was unable to fly a kite, I observed his own mother struggle to come up with a response, settling on “it’s not easy.” A nearby mother stepped in and explained that “nobody is born knowing how to fly a kite. You have to learn how and figure out

what works best." In each of these instances, the mother who had struggled with feedback appeared relieved to have assistance and reiterated what the intervening mother had stated. Thus, the playgroup mothers acted as a support network for one another to assist in the adjustment of feedback patterns.

Finding 5: Mothers were able to extend beyond their children to themselves as learners.

As mothers struggled to adopt new feedback patterns, they not only considered their children's implicit beliefs and learning experiences, but their own as well. More than half of mothers (63%) provided examples of ways in which they revised their thinking about achievement and effort, indicating that they were beginning to change their own implicit beliefs. For example, one mother mentioned taking things she already does well and trying to do them in new ways. Another mentioned committing to learning a new instrument alongside her son, even though she had previously told her son that she had no music talent. One mother, who is also a student, began to look at her math class in a new way, attributing her struggles to her own ineffective strategies rather than to the inadequacy of her teacher.

Nine other mothers compared the process of learning to adjust their feedback to the learning processes that their children undertake in any number of circumstances. One of these mothers used a questionnaire to describe her change in thinking as follows:

"I'm the one having the change in mindset by finally noticing the effort my children put into learning new behaviors or trying to be the perfect little people we are expecting them to be. It's important to me not to expect them to be perfect little adults,

but rather to give them opportunities to try and make mistakes and learn and to take the moment to praise them for their willingness to try."

The other eight mothers described similar experiences of gaining new insight into their children's learning process by drawing analogies to their own attempts to adjust their feedback or think about ability and effort in new ways.

Mothers who reported these feelings of learning to view themselves as learners rather than as having fixed abilities were among the most prolific writers on questionnaires and were the most likely to spontaneously volunteer information in informal settings. They sent more unsolicited emails and text messages than did the other mothers and brought up the topic in conversation more than three times as often as the rest of the mothers. Thus, it is possible that these mothers were among the most diligent in considering the feedback they provide their children.

Goal 2. Children will be able to describe how the brain changes through effort. Field notes revealed moments when children both evoked and failed to evoke information about the brain when approaching a challenge or problem. Parent questionnaires and interviews offered parental observations of children's speech about the brain. A video of the children's explanations of how the brain learns as well as the children's descriptions of their drawings about their brains learning all revealed how the children understood the role of the brain when working through a challenge.

Finding 1: Young children showed evidence of understanding how the brain changes through effort.

In video interviews, children explained what happens to the brain as it learns. Two reviewers with experience interviewing children and a third reviewer with research

experience and young children of her own sorted the children's responses into categories. The first two interviews were reviewed together to help calibrate responses. These categories were collapsed into four categories which encompass every comment the children made about the brain in the videos. The categories and corresponding responses were then re-checked by the reviewers for agreement.

First, all children mentioned that, in order for the brain to learn, a person has to "practice," "work hard," "try," or "do something lots of times." Many of the children also described building "connections" in the brain or the brain getting "stronger." Several children went on to discuss the end result of "getting better" at something or finding it to be "easier." The children's responses are summarized in Table 4.

Table 4:

Children's Explanations in Video Interviews of How the Brain Learns

Explanation of the Brain	Percent
Practice/work hard/try/do something lots of times	100%
Connections in the brain	89%
Brain gets stronger	89%
Something gets easier or you get better	44%

The nine children made a total of nineteen statements about the brain, sixteen of which involved the relationship between two or three of the above categories. For example, one child stated that "when you work really hard, the brain gets stronger and stronger about it." Another explained that "when you practice, the brain neurons

connect." Several children were able to articulate the benefits of such connections with statements such as "lots of connections make something easier."

Two weeks later, when children were asked to explain the drawings that they made about how they had recently made their brains stronger, only four children offered explanations. Since the children were interviewed about their drawings at the beginning of the playgroup gathering before they had become comfortable with their surrounding (the location of the playgroup gathering changed weekly), the low response rate is not unexpected. Their responses were:

- "My brain made lots of connections because I worked really hard on my Lego set and it took a really long time."
- "I read a book and it made my brain connect. If you don't know what the letters say, you just sound it out. That made my brain connect."
- "It connected because of my dancing feet."
- "I made lots of connections in my brain with doing mazes. They got harder and harder and my brain had to keep making new connections and sometimes I had to print the maze again because it was so hard."

Three of the responses demonstrate a thorough understanding of the way the brain learns even two weeks after the children participated in the playgroup brain activity. The child who responded "I connected because of my dancing feet" was able to thoroughly recount the information about the brain during our group review session, as were three of the five children who did not bring pictures to explain. The remaining two children remained silent during the review, thus it is possible that they had not remembered any information about the brain, though it is equally likely that they simply did not wish to speak.

During the course of playgroup gatherings that were not explicitly focused on the brain, there was a low incidence of children spontaneously mentioning brains. Field

notes reveal only three incidents, with three separate children. These children had attended both of the activities that involved discussion of the brain, and their comments about brains took place two to four weeks later. One child told another adult "I connected up my brain and look what I can do now!" Another child told his mother "I don't think my brain is strong for this yet," indicating not only an understanding of the brain as a necessary component of learning, but also the belief that he can still learn to do something (rather than a belief that he lacks an innate unchangeable ability to accomplish the task). Finally, one child provided encouragement to another who was struggling to swing by himself by explaining that "you just need to do it more, then your brain will connect for it."

While three spontaneous instances of brain discussion would seem like a low number, given the wide range of play activities in which children engaged at playgroup and the low percentage of conversations observed and recorded, the fact that any instances were observed is somewhat surprising and encouraging.

Finding 2: Children who engaged in more frequent experiences providing opportunities to learn about the brain produced more brain talk

Six playgroup mothers reported that their children had discussed the brain at home in the weeks that followed the playgroup brain activity. One child had a challenging experience with a new sport and reported that "her brain got so big" and that "sometimes it was hard but I told my brain it was making new connections so it's ok." Another child explained to his brother that his brain was getting stronger when he was practicing putting his own shoes on. Two children provided encouragement to their parents when they could see their parents were struggling, explaining that their parents

brains needed to make some new connections and they would do so with continued practice. One child argued that he should be allowed to play Lego because he needed to make his brain stronger. And, finally, one child insisted that he did not need to practice tying his shoes because his brain had already made those connections. Of these six children, four reportedly spoke about the learning process of brains on multiple occasions.

None of the workshop-only mothers reported that their children had spoken about brains, even those mothers who had discussed the brain's learning process with their children. It is possible that the playgroup activity with the visuals, manipulatives, and group participation provided a rich experience that allowed children to understand the brain in greater depth than those children who were simply given explanations by their mothers. Children who attended the playgroup activity likely had more a more vivid recollection of the brain from which to draw.

Goal 3. Children will display more mastery-oriented responses to challenges and set-backs. Weekly field notes and observations of the challenge opportunities provided information regarding how children responded to frustrations and failures as well as how they spoke about them to themselves and to one another. They also provided information regarding the children's affect during possibly frustrating situations. Parent questionnaires and interviews provided the mothers' observations of children's responses to challenges, as well as mothers' ratings of their children's responses to challenge.

Finding 1: Children developed mastery-oriented response patterns during playgroup gatherings.

Prior to implementation of the curriculum, I observed roughly the same number of children's helpless responses to challenges as mastery-oriented responses. During the weeks that followed the activities, helpless responses to challenges continued to decrease while mastery-oriented responses increased.

Finding 1a: Challenge-seeking at playgroup gatherings increased after implementation of the curriculum.

During the month preceding implementation of the curriculum (observation weeks one through four), I posed opportunities for children to accept challenges at most playgroup gatherings. Children were asked if they wanted to do something "the easy way" or "the hard way," if they wanted to try something "a little easier" or "a little harder," or, if they wanted to do something they "can already do" or something they "haven't learned to do yet." Due to the informal nature of the playgroup gatherings, not all children received the same challenge opportunities with the same language at each gathering.

Regardless of the language used, about half of the children accepted each challenge and half declined. Individual children were classified into one of three categories based on the number of times they accepted challenges prior to implementation of the curriculum. Table 5 shows the categories for the children who would later attend and participate in the curriculum activities.

Table 5:

Challenge Acceptance Prior to Implementation of Curriculum

Percentage of Challenges Accepted	n
75% or more	3
40% - 60%	3
Fewer than 25%	3

I continued posing challenge opportunities during some playgroup gatherings for several weeks after the implementation of the curriculum, though, again, due to the informal setting, not every child was given the same challenge opportunities as others. On some weeks (observation weeks two, six, eight, and 11-14) I offered no specific challenges. Regardless of whether children were given explicit challenge opportunities or not, I tallied any spontaneous challenge-seeking behaviors that I observed at each playgroup gathering. This includes the instances when I observed them accept or decline a challenge they posed to each other or to themselves, or a challenge posed by another adult. The instances when I observed children accept or decline challenges from any source are represented in Figure 1.

In the weeks prior to implementation, children accepted challenges roughly half the time. On the day of the first playgroup activity, children had the opportunity to accept a challenge as part of the activity. All children accepted, but some children declined other challenges during their free play time later in the morning. During and after the first playgroup activity about the brain, children were much more likely to accept challenges. The second playgroup activity involved children inventing

challenges together. A large number of the instances of children declining challenges during that activity may have been due to disagreements about which challenges to attempt.

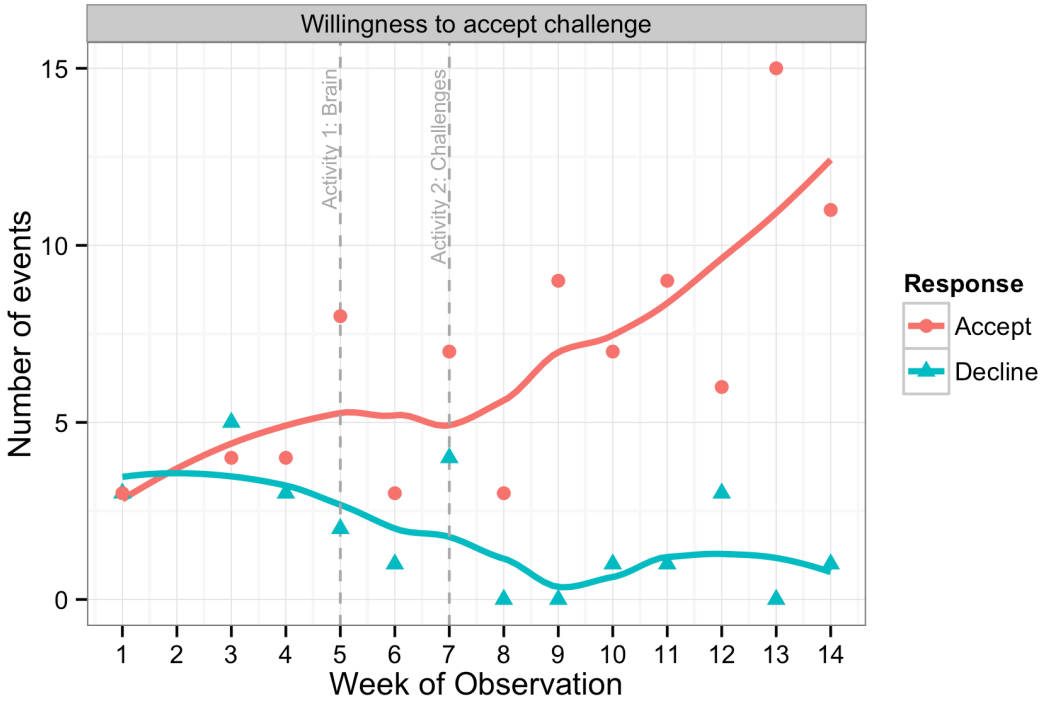


Figure 1: Children's Observed Willingness to Accept Challenges

I posed very few challenge opportunities on weeks nine and ten, and none on the weeks thereafter. The formal implementation of the playgroup activities in the curriculum had ended and I was concerned the children would begin to feel too much pressure if I continued explicitly discussing the content. It is during these weeks, however, that children began to pose more challenges for themselves and each other. Almost all of the challenges posed during the last five weeks were posed spontaneously by children. Thus, children not only accepted more challenges after implementation of

the curriculum, but they began to invent more as well. This is consistent with research that suggests that recursive processes reinforce this type of behavior when children have positive experiences with new ways of thinking (Yeager & Walton, 2011).

As the weeks passed, children's invented challenges changed from simple adjustments to make their activities more difficult ("Now let's try it with our eyes closed!" "Let's get all the way to the top!") to taking on more time-consuming group challenges. On week 13, the children decided to build a large structure out of sticks. They engineered the project themselves and encouraged each other to join in and continue with the activity. Many of the children had been in the playgroup together for several years and had not invented these types of group challenges until this point.

Finding 1b: Children more often displayed positive affect when encountering challenges and set-backs at playgroup gatherings after implementation of the curriculum.

Affect was observed when children were faced with failures or setbacks or with challenges that they could not immediately master. Affect was considered to be negative when children became angry or frustrated with a task, indicated that they were sad or upset, shied away from the task, or made disparaging remarks about completing the task. Affect was judged to be positive when children were either smiling or laughing while completing the task, made comments to indicate they were enjoying the task, or simply remained focused with none of the negative indicators above. Positive affect was most often accompanied by continued effort on the task, while negative affect usually involved the child giving up. There were occasional instances of a child cheerfully admitting defeat or growing increasingly frustrated and persisting. Instances of

observed affect when confronted with failure or challenge during playgroup gatherings are plotted on Figure 2.

Prior to implementation, children responded to failures and setbacks with positive affect roughly half the time. On the day of the first playgroup activity about how the brain learns, I observed an unusually high number of instances of children responding to failures or set-backs with positive affect, although this effect did not hold for the weeks immediately following.

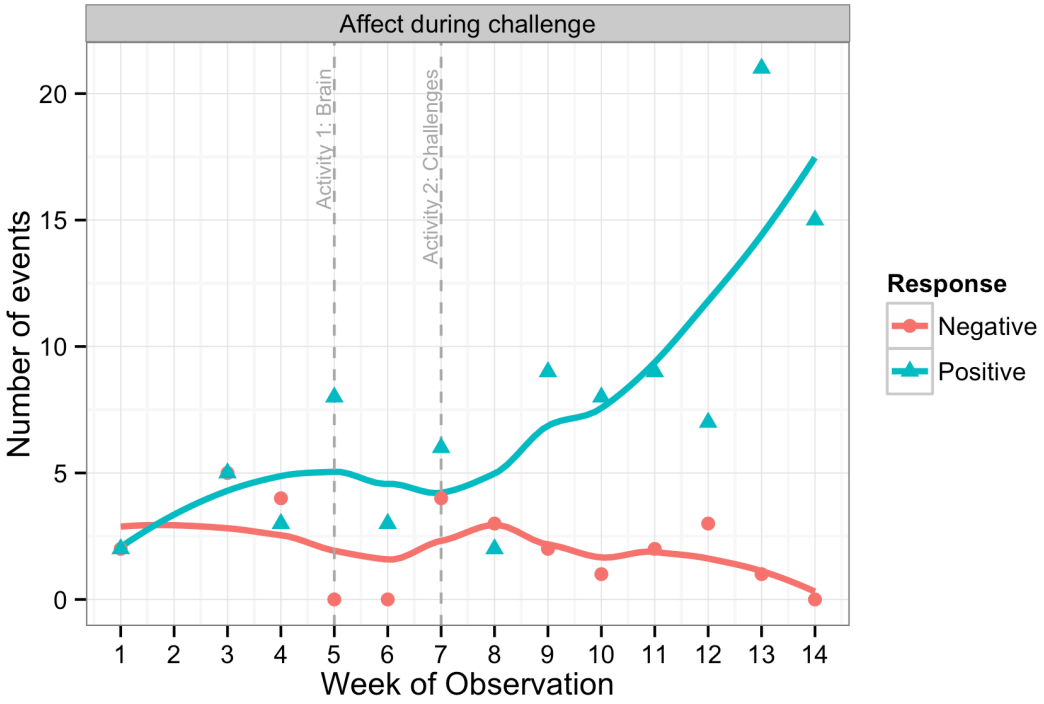


Figure 2: Children's Observed Affect During Challenges

As with challenge-seeking, positive affect did continue to increase after several weeks had passed. This was accompanied by a decrease in negative affect. The spontaneous child-led activity of building a structure from sticks on week 13 involved

children continuing to sing and laugh as they persisted, even as their structure fell several times. The timing of the increase in positive affect makes sense when viewed in the context of the comments made by mothers in questionnaires and interviews. The increase in positive affect occurred immediately after the mothers began to report feeling more comfortable and consistent with adjustments to their feedback patterns.

Finding 1c: Children more often attributed success and failure to effort and strategy rather than to ability at playgroup gatherings after implementation of the curriculum.

Prior to implementation of the playgroup activities, children rarely made comments during playgroup gatherings that would suggest they attributed their successes and failures to the process they had employed in the situation or to the specific context of the activity. Field notes for the weeks prior to the activities include observations of children making statements such as "that's too hard for me," "he can't do it," and "I'm not good at this." Statements about fixed traits and abilities had become frequent and a cause for concern among the mothers who voiced their dismay in several conversations.

When children learned about the brain during the first playgroup activity, they began to make comments attributing successes and failures to the effort they had exerted, the strategies they used, and the specific context in which they were engaged. I recorded instances of these attributional comments that I observed and plotted them on Figure 3.

The second playgroup activity included extensive discussions about children's failures as they attempted various challenges on the playground. The high number of

both helpless and mastery-oriented attributions that day can be explained by taking these discussions into account. Any time I observed a child offer a helpless attribution of failure during that activity, we discussed possible mastery-oriented attributions that might help explain the failure. Observations of helpless attributions immediately began to fall off after the activity until they became practically nonexistent. Likewise, I observed children posing an increasing number of mastery-oriented attributions.

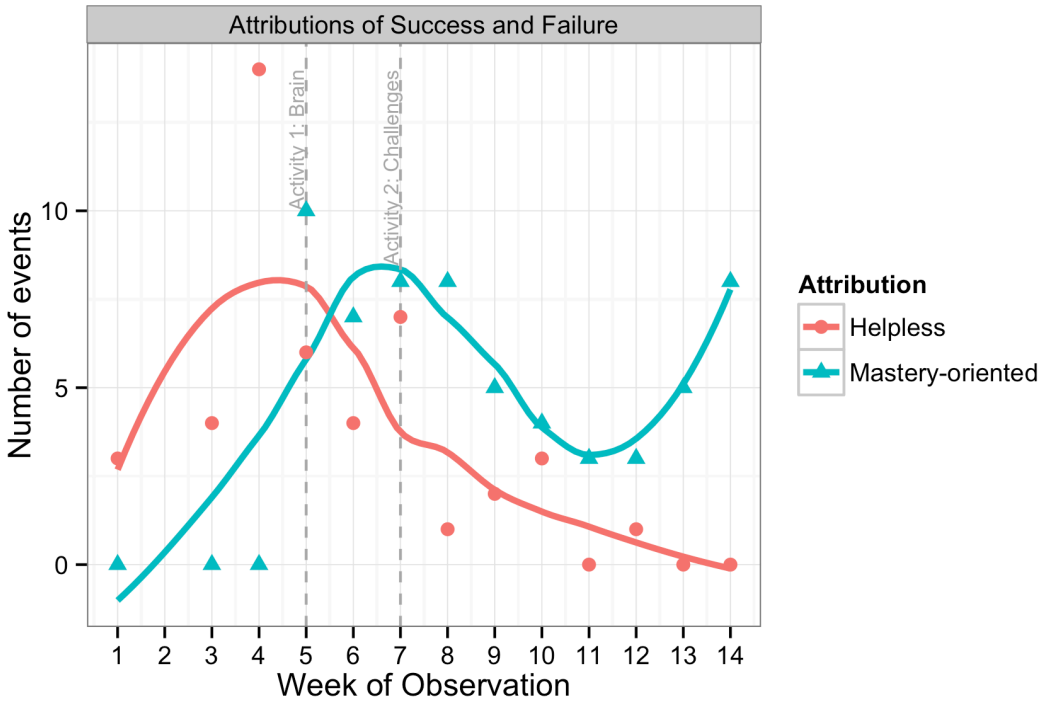


Figure 3: Children's Observed Attributions of Success and Failure

When describing why he was unable to fly a kite on week 14, one child who had made several statements in January that would suggest he held an entity framework, explained that he thought it "didn't work because there wasn't enough wind." Another

child told his friend that he was practicing leaping off of the climbing structure so he could learn to land on his feet, though he never succeeded.

Over the past year, I observed that one child almost always needed to be removed from craft projects due to his outbursts of frustration and tearful insistence that he "can't" complete the task. I observed his mother reluctantly provide him with the materials he needed to make a mask on week 13. When his materials would not stick to the mask, he began to swell with emotion. Shortly after his predictable tantrum had begun, he suddenly took a deep breath and stated "I think I didn't use enough glue. I think I can do it if I have some more glue." His mother watched anxiously as he tried his new strategy, only to see his materials fall off again. Instead of having another outburst, he simply stated "I'm still learning how to make a mask" and continued with his project. Although he never got all of his materials to stick exactly the way he had planned, he managed to figure out a strategy to attach most of them before running off happily to play with his creation.

The sharp upturn in mastery-oriented attributions after several weeks of practice is consistent with other research that shows that positive experiences with these types of behaviors create a feedback loop wherein the behavior becomes ever more present as children experience more success with it (Yeager & Walton, 2011).

Finding 1d: Children were more likely to encourage one another to persist at playgroup gatherings after implementation of the curriculum and less likely to tell one another they lacked the ability to succeed.

Prior to implementation of the curriculum, children rarely encouraged each other to persist with a task. Several instances were observed, however, of children telling one

another they lacked the ability to be successful. For example, one girl told another that she was “not fast enough” to win a game. One boy told a girl that she “can’t climb to the top” of the climbing wall. Another girl explained that a boy was not allowed to play with her and her friend because “boys aren’t good at playing [those types] of games.” Comments attributing one another’s abilities to fixed traits or generic categories were not common, but occurred somewhat regularly. Observed instances of these comments are plotted on Figure 4 along with mastery-oriented comments about learning, progress, strategies, or situational attributions.

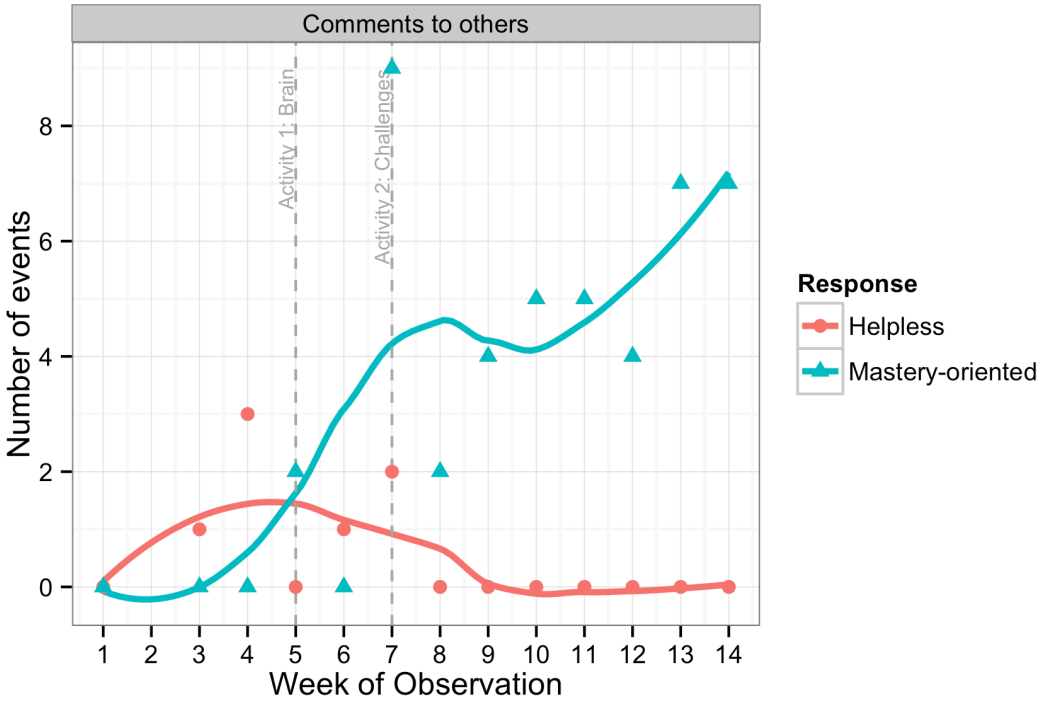


Figure 4: Children's Observed Comments to Others

As with the other measures, the weeks that followed the implementation of the curriculum showed a remarkable turnaround, although this time the change was

immediate. Comments about others' fixed traits and generic categories ceased to be observed altogether. Meanwhile, children began to use mastery-oriented comments to encourage one another to persist.

The most frequent type of encouragement observed involved discussion of strategies. When the stick structure fell down on week 13, one child suggested to two others that perhaps they needed longer sticks for the base. When they failed to find long sticks, one boy was going to play something else when the third stated "maybe there just aren't any more long ones in this area. We should try a new area!" All three boys went to a new area and continued their project with the rest of the children.

On another day (week 10), when a girl was struggling to blow bubbles and was about to give up, another girl encouraged her to keep trying and suggested several new strategies she could try. When she was eventually successful, both girls cheered.

Children also engaged in conversations about learning and progress. Two children swinging next to each other exchanged the following conversation on week 13.

Boy: (to his mother across the playground) Mommy! Why won't you push me!

Girl: You can just pump your legs.

Boy: I don't know how to do that yet.

Girl: I had to learn how to do it too and you just start really still and move your legs back and forth. You can figure out how to make the swing start moving and then you just learn how to do it harder.

Both children emphasized learning and progress with one another. While the boy decided he was not interested in learning to pump his legs at that moment, I observed

him return to the swing later and try out the strategy the girl had suggested. I then observed him take another break and return a third time to try again.

Finding 2: Mothers report that children increasingly display mastery-oriented responses in homes where parents have invoked language to support them.

After the parent workshop, most mothers were asked to rate their children's typical pattern of response to challenge on a five-point scale with 1 being helpless and 5 being mastery-oriented. After engaging with the material for one to two months, mothers were asked to perform the same rating.

For analysis, the mothers were split into three groups according to their participation and responses. The first group includes the eight playgroup mothers who received the rating scale. All eight of these mothers had described feeling successful with adjusting their feedback patterns one month after the parent workshop. The second group contains the eight non-playgroup mothers who also reported feeling successful in adjusting their feedback. The final group includes the three non-playgroup mothers who, one month after the parent workshop, reported being mostly unable to adjust their feedback. The mean of the pre and post responses were calculated for three groups and plotted in Figure 5. Three paired sample *t*-test were used to assess the statistical differences in the mean pre and post responses for each group.

The first group of mothers, which included only mothers from the playgroup, reported a significant increase in their ratings of their children's mastery-oriented responses to challenge ($t = -7.94$, $p < .001$). The second group, the "Non-playgroup feedback adjusted", which included non-playgroup mothers who also reported feelings of success in adjusting their feedback, appears nearly identical to the first group in their

pre-workshop ratings and also reported a significant increase in their ratings of their children's mastery-oriented responses to challenge (t = -4.97, p < 0.01). The playgroup mothers reported slightly higher scores for their children than did the non-playgroup mothers. The "Non-playgroup feedback not adjusted" group, non-playgroup mothers who reported being unable to adjust their feedback were among the mothers who rated their children as the most helpless at the time of the parent workshop. The increase in their ratings one month after the parent workshop was not significant (t = -2.00, p > 0.05). See Figure 5.

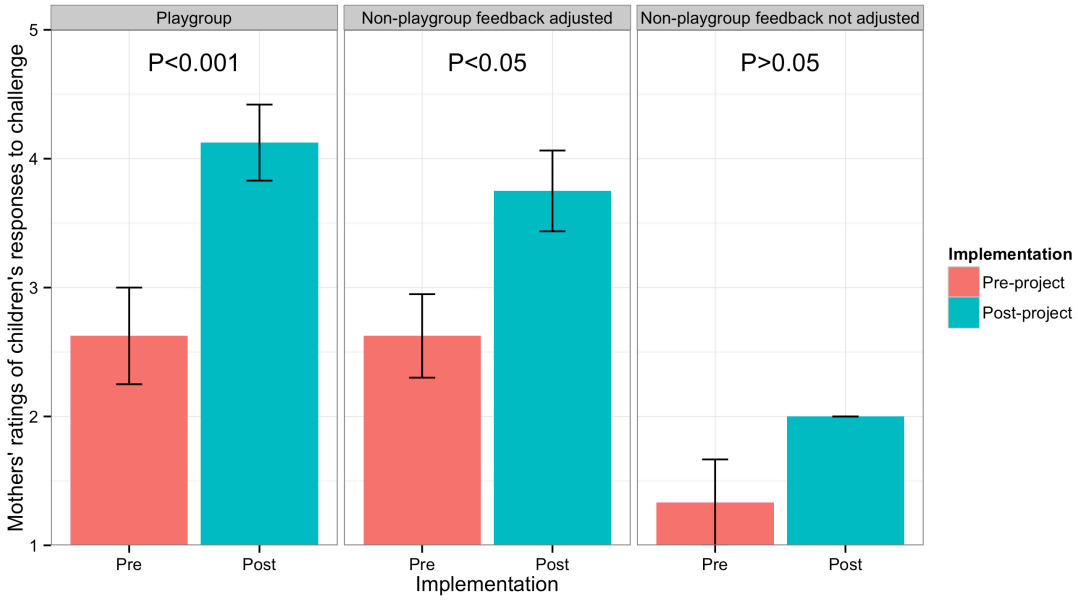


Figure 5: Mother's Ratings of Children's Responses to Challenge by Playgroup Membership. The error bars represent the standard error of the mean.

Questionnaires and interviews reveal the process by which these changes took place for the families in the study. In the first week after the workshop, most mothers wrote and spoke mostly about their own struggle to adjust their feedback. The second week's comments centered around instances when they were able to provide the types

of feedback we had discussed during the workshop. As time progressed, mothers increasingly spoke about times when their children persisted, often unexpectedly.

The following example from a questionnaire was collected two weeks after the parent workshop. The child had grown upset that she was unable to slide in a water game. The mother described the situation:

> Instead of trying to calm her down by distraction or trying more to help her do it (like I normally would), I talked to her about how it takes a lot of tries and she might not get it today but if she keeps trying, maybe she'll slide a little more over time, and if she gets tired of trying she could take a break and play in the pool for a bit, etc. etc. And it totally worked! She tried a few more times with a little frustration but nothing huge, took a break here and there, some long breaks, then a while later actually figured it out! She was SO proud of herself (she even said "I'm so proud of myself!"). Even more exciting, after she got it she went to show me and didn't get it at all, but took that fail in stride and tried again right away!

In an unsolicited email during week seven, another mother noted that her son had been "sounding out words for a while but he would always get too frustrated to read the entire book until last night." This mother had, during the preceding week, pointed out on several occasions how much progress her son had been making with reading and how she had struggled to learn to read when she was young.

Several mothers indicated that their children had begun to encourage their siblings and parents with mastery-oriented language. In an interview one month after the parent workshop, one mother reported that her son saw that his father had missed a button when buttoning his shirt and told him, "It's ok Daddy, you just need to practice." A questionnaire three weeks after the parent workshop included a response from another mother who, in an attempt to normalize problems and struggles, reported explaining that the father's job involves solving problems all day. Now the boy

frequently asks his father if he was able to solve any problems at work that day. When he encounters a problem himself, he now pretends he is at work and needs to solve the problem. In an interview with another mother, the mother reported that her child, who had been exhibiting a helpless response to learning to tie his shoes prior to implementation of the curriculum, began to sit down with his baby sister on a daily basis to practice tying his shoes, telling her "it takes a lot of tries to learn something like this. When you're bigger you can learn it too but you will probably mess up a lot. I used to mess up a lot but now I just mess up sometimes."

In contrast, the three non-playgroup mothers who struggled to adjust their feedback patterns continued to comment on how difficult they were finding the task. Their observations of their children continued to center around instances when their children displayed entity beliefs or helpless responses and a depiction of the mother's struggle to provide the desired feedback.

Finding 3: Children who engaged in discussions about how the brain learns were reported by their mothers to demonstrate more mastery-oriented behaviors

While all children who attended the playgroup activities learned about how the brain learns and changes through effort, not all mothers reinforced this message at home. In questionnaires, mothers were asked: "Have you or your child talked about the learning process of the brain? Please explain." Interviews with playgroup mothers included similar wordings of the question. Only four playgroup mothers (50% of those asked) and three non-playgroup mothers (27%) reported speaking to their children about the brain. Thus, most non-playgroup children heard nothing about the brain at all since they did not attend the playgroup activities.

Again using the mothers' ratings of their children's responses to challenge, mothers are grouped in Figure 6 into five groups according to how much exposure their children received to discussion about the learning process of the brain. Again, the mean and standard error of the pre- and post- responses were calculated and plotted and a paired sample *t*-test was used for each group to assess the statistical differences of the change. Statistical tests resulting in $p<0.05$ were determined to be statistically significant. Note that all playgroup children learned about the brain during playgroup activities regardless of whether their mothers reinforced the message at home.

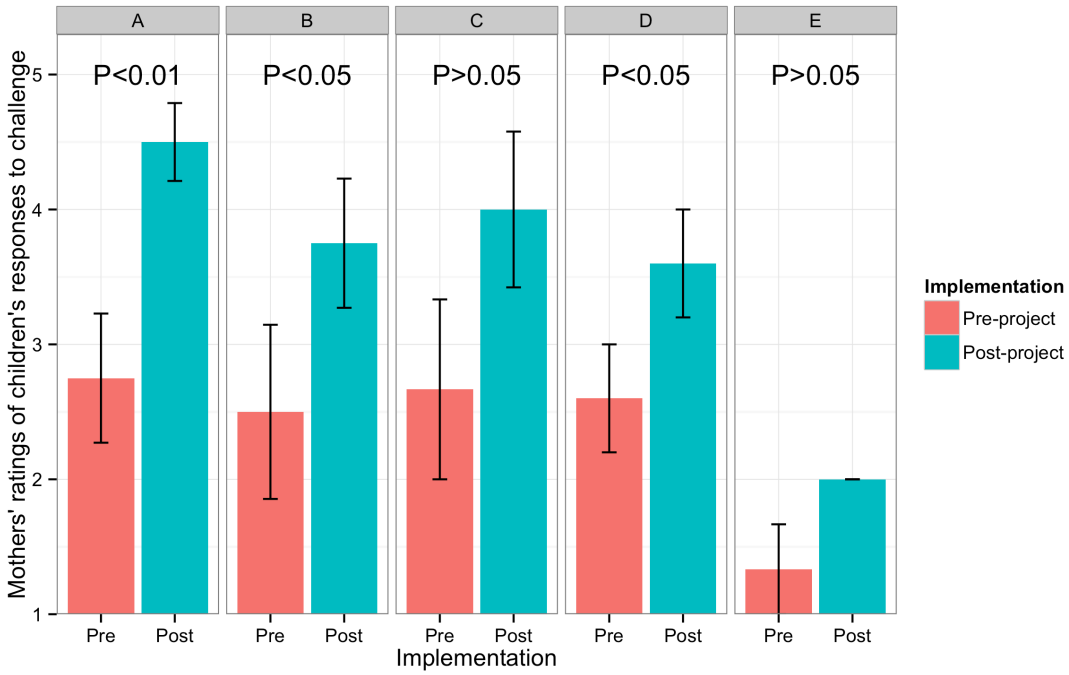


Figure 6: Mother's Ratings of Children's Reposes to Challenge by Playgroup Membership and Brain Discussion

Group A consisted of four playgroup mothers who spoke to their children about the brain and also provided other desired feedback. This group showed a significant

improvement in post-implementation ratings (t=-7.00, p<0.01). Group B consisted of four playgroup mothers who reported adjusting their feedback but did not speak about the brain, and also showed a significant improvement (t=-5.00, p<0.05). Group C was three non-playgroup mothers who spoke about the brain and reported adjusting their feedback, had only marginally improvement in ratings at p=0.057 (t=-4.00, p>0.05). Group D was five non-playgroup mothers who reported adjusting their feedback but did not speak about the brain also showed significant ratings improvements (t=-3.16, p<0.05). Finally, group E, who were three non-playgroup mothers who did not speak about the brain and struggled to adjust their feedback, showed no improvement (t=-2.00, p>0.05). See Figure 6.

Both groups A and B showed a statistically significant improvement in mothers' rating, but group B's improvement was smaller than in group A: the difference in mean pre- and post-implementation ratings were 1.75 and 1.25, respectively. Group C exhibited only a marginally significant ratings improvement, but the effect size (mean ratings difference of 1.33) was larger than in group D (mean ratings difference of 1.00), even though group D's p-value was less than 0.05. This difference in p-values for C and D may be attributable to sample size differences (n=3 and n=*5*, respectively). Group E was not statistically significant and had the smallest effect size (mean ratings difference of 0.67). The group that experienced the greatest increase in parental ratings of children's mastery-oriented responses to challenge included children who attended the playgroup activities about the brain and also engaged in brain discussions with their mothers (Figure 6: A). Thus, although parental feedback adjustment appears to be an

important element in increasing children's mastery-oriented responses to challenge, information about the brain appears to help as well.

Finding 4: Children responded negatively to direct feedback while they were experiencing frustration.

While mothers reported many instances of children's mastery-oriented responses to challenge following conversations with parents on topics such as process, effort, and the universal experience of failure, some mothers also reported resistance from their children. This was true of one mother who explained to her child that *New Shoes* was a story about working hard and not giving up, and another who tried to use the book to draw a direct explicit link to her child's experience. During interviews, both of these mothers reported that their children became annoyed by the book and did not want to continue reading.

Although these two mothers reported resistance form their children regarding *New Shoes*, eight other mothers reported that they had used the book to have very involved discussions with their children about frustration and persistence, and that the book provided a useful third party character as the focus of the discussion. These mothers described using the opportunity to discuss these ideas in a deeper way than they are usually able to when the discussion is about their children directly. All of these mothers reported mastery-oriented responses from their children that appeared to them to be directly linked to the discussion. Five of their children asked to learn to tie their shoes (the topic of frustration in the book) and four referred to the book when they had succeeded at something after several tries.

Other mothers also reported that they had learned to not be too direct in discussions with their children about persistence. Five mothers reported resistance from their children when the mothers brought up the workshop material overtly during times of their children's intense frustration. One mother, when asked on a questionnaire two weeks after the parent workshop to describe a situation when she provided feedback to her child, responded:

> I learned not to bring it up when she's frustrated. It's best to talk about it in relation to 3rd parties. I've been better recently about not laying it on so thick. It's more about slight adjustments in how I speak and how I phrase things. It comes up more when she's not frustrated – during success or talking about someone else. When she's frustrated is when it should all come together from what you already did.

Four other mothers made similar statements during interviews, emphasizing that they experience the most success by praising their children strategically during calm times and watching their children call upon the ideas from that praise while they are frustrated.

Previous research suggests that people feel defensive when they are made aware that they are being targeted for intervention, and that feedback works best when provided in a less immediate way (Yeager & Walton, 2011). Mothers' statements support this finding and demonstrate that it holds true for very young children. Similarly, when conducting the parent workshops, I experienced less resistance and discouragement from mothers when I avoided mentioning their own feedback patterns and instead spoke about the importance of rephrasing feedback from third parties.

Discussion

Although this study was limited by a small sample of convenience and a short period of implementation and evaluation, several findings from previous research were confirmed in this informal playgroup setting, and several findings may be of use to future researchers and practitioners in a variety of settings.

Mothers were generally able to adjust their feedback patterns to focus more on process and effort rather than speed, accuracy, or innate ability. Those mothers who had the support of the playgroup were also able to shift generic speech to nongeneric speech. Although adjusting feedback proved to be the most difficult for those mothers who felt they had the most adjustments to make, mothers who had the benefit of the playgroup for support felt they were largely successful. Mothers in the playgroup assisted each other in providing feedback, sometimes offering rephrased feedback for a struggling parent. Non-playgroup mothers who did not have access to this support network were also successful in beginning to adjust their feedback, with the exception of those mothers who felt they needed to make the largest adjustments. Mothers in the latter group felt they were ultimately unsuccessful in changing their feedback patterns. These mothers may have been more successful if they were part of a supportive community as indicated by Goal 1, findings 3 and 4, and Goal 3, finding 2. The benefits of learning with support from other learners have been well-documented in other areas of research (Lave & Wenger, 1991), thus it is not surprising to find that these benefits extend to mothers in this setting as well.

It is unclear whether the mothers in the playgroup were able to provide effective support to one another simply because they were all engaged in the same process of

adjusting their feedback, or if their prior relationships with one another played a vital role. The communal aspect of the playgroup prior to implementation of the curriculum may have been instrumental in allowing mothers to support one another. Future research might address this question as well as further explore the relationship between consistent participation in playgroup settings with the application of motivation theory to playgroup practices. It is likely, however, that other existing communities of parents or caregivers might enjoy the same supportive benefits as observed in this study.

While changes in parental feedback seem to have contributed to more mastery-oriented responses to challenge in children, it is unclear whether parental speech about brain changes helped contribute. Some children who received direct instruction about the brain during the playgroup activities spoke about the brain to others, while children who heard about the brain only from their mothers did not. This is not surprising given that the playgroup activity included visuals and objects that the children could hold. None of the mothers reported using such items at home when discussing the brain.

One finding that was particularly striking was the steady increase in observed mastery-oriented behaviors in the weeks that followed the playgroup activities. Yeager and Walton (2011) explain how the recursive process involved in changes in these types of thinking produce a kind of snowball effect. When children try out a mastery-oriented behavior and experience success, they are more likely to employ the behavior more often. This is supported by my observations of children's responses to challenges during playgroup meetings. Whether or not this result holds for these children in other settings is unclear, though playgroup mothers also reported increased mastery-oriented

behaviors at home. In any case, that this steady increased was observed in this limited study at all suggests that this finding by Yeager and Walton is particularly robust.

Finally, Yeager and Walton (2011) also argue that the most successful programs in this field are "stealthy" (p. 284) in that they do not reveal that they are intentionally targeting people for intervention. This finding is supported in the present study both for young children and their mothers. Mothers who were told to practice adjusting feedback from a third party displayed less discouragement than those mothers who were engaged in activities that referred to their own feedback patterns. Similarly, mothers who spoke to their children about successes and failures of a third party experienced none of the resistance from their children that more direct conversations sometimes elicited. This could also help explain why objective lessons about brain function in general were readily welcomed by the children. This finding is particularly important given that it is often overlooked by programs targeting teachers and parents. While it may seem more efficient to simply teach students and teachers about "growth" and "fixed" mindsets (Dweck, 2006) and suggest that they develop a growth mindset, the current study supports Yeager and Walton's assertions that more subtle methods are more effective.

VIII. Conclusion

Children who display mastery-oriented responses to challenges may be at an advantage later in school, the workforce, and other settings. In order to succeed, children will benefit from being willing to accept challenges, understanding how persistence can pay off, being able to attribute success and failure to helpful causes, and being able to view their progress over time. Research pioneered by Dweck (e.g., Dweck & Leggett, 1988) suggests that the way children understand the malleability of traits and abilities can influence the way they respond to challenges. A review of research on adolescents (Yeager & Walton, 2011) suggests that brief, nonthreatening, engaging programs that take children's perspectives into account can be effective in increasing children's mastery-oriented behaviors. Attempts to adapt these programs for young children have shown promise (Master, 2011; Pawlina & Stanford, 2011). *I Can and I Will* builds on these earlier works while engaging the whole family in the process.

During the implementation and evaluation of *I Can and I Will,* findings from earlier studies were confirmed and some key components for an effective program for families began to emerge. The findings of this study indicate that a successful family education program to increase mastery-oriented responses in young children might include the following:

- Brief, targeted lessons for children that are engaging and include manipulatives and visuals. These lessons should be objective rather than too personal, relating children's own experiences to learning that emphasizes universal common experiences shared by all people.

- Instruction for both children and caregivers on the way the brain changes when working hard on a problem.
- Opportunities for children to practice attributing success and failure to something other than their innate abilities and to evaluate strategies for persistence.
- Objective, nonthreatening education for parents that explains the link between feedback, implicit beliefs, and children's responses to challenge, and emphasizes the parent's role in adjusting the type of feedback their children receive from a variety of sources.
- Continued support for parents both from the educator and from other parents engaged in the same curriculum.

While many of these features that I found to be helpful with both young children and their parents have previously been shown to be effective with adolescents, programs in schools that target teachers and students sometimes lack some important components. Schools are more frequently being told to educate teachers and parents about implicit beliefs (usually using Dweck's terms "growth" and "fixed" mindsets), yet given little instruction on how to do so. Simply providing teachers with a chart showing fixed mindsets on one side and growth mindsets on the other may be an efficient way to provide them with information, but it does not include any steps to bring about changes in their beliefs and subsequent speech that have been shown to be effective.

While it is not always possible to involve parents in curricula for children, a shift in the way educators speak about challenge, success, and failure can still be

attained. Teaching people about how the brain changes as it works through a problem might be more effective than simply telling someone to work hard. Celebrating a third party's persistence despite setbacks and failures might be more effective than telling someone to keep trying. Discussing strategies and process might produce greater student achievement than celebrating successes.

The language used in many schools and families that emphasizes speed, accomplishment, and abilities might be producing children who are afraid of failure. When children can view failure as an opportunity for growth, they stand the chance of pushing themselves to ever greater learning.

Appendix

I Can and I Will

A Whole-Family Curriculum to Teach Persistence

By Marie Lockton

Contents

Acknowledgements

Special thanks to Linhchi Tang for creating the illustrations for the book titled *New Shoes*. Tang created the illustrations specifically for use in this curriculum and has granted full permission for their fair use reproduction and distribution when used in conjunction with *New Shoes* as a whole.

Overview

"I can't." "I'm not good at that." "Boys can't play that." These statements from the mouths of four- and five-year-olds hint at a type of thinking that can hold them back from a challenge. Children who believe that abilities and traits are innate and fixed might feel anxious about failure. After all, if they fail at a task, that failure shows that they are not capable of that task. These children often prefer to give up quickly or refuse to try in the first place.

On the other hand, children who believe that traits and abilities can be improved through effort often view challenges as opportunities to improve. They are not held back by stereotypes or fear of showing that they lack innate ability. They believe that failure is an opportunity to grow and to look at things in a new way.

This curriculum aims to help young children develop a growth mindset, to embrace rather than avoid challenges, and to enjoy persevering. By teaching children that learning is a process, mistakes are valuable, and abilities are malleable, children can change "I can't" into "I can't…yet!" Families play an integral role in the curriculum to ensure that children's home environments support a love of challenge.

Goals:

1. Children and families will gain a deeper understanding of how the brain learns while working through a problem.
2. Children will increasingly embrace challenges, persist when they encounter set-backs, and attribute failures to appropriate causes.
3. Parents will provide feedback to their children that will support growth mindsets.

Activities:

- Parent workshop – Raising Perseverant Learners
- Children's Lesson 1 – Your Learning Brain
- Children's Lesson 2 – Celebrating Mistakes
- Book for Families – *New Shoes*

Features:

Self-reflection – Children reflect on their own responses to challenges in the past and present. They develop a growth mindset to help them with future challenges and failures. They learn how to evaluate their effort and strategies and adjust them when needed.

Encouraging and Teaching Others – Children encourage others to take on challenges and persist. They teach others about how the brain changes while working through a problem.

Whole-Family Education – Parents learn to nourish their children's emerging growth mindsets. Materials support continued conversations between parents and children to encourage challenge-seeking, persistence, and growth through failure.

Frequently Asked Questions

What is the target age range for *I Can and I Will*?

While the parent workshop is appropriate for parents of children of any age, the other materials and activities are designed for four- and five-year old children.

What type of setting is appropriate for *I Can and I Will*?

The parent workshop can be useful for any group of parents who are interested in fostering a growth mindset in their children. The rest of the curriculum can be used with informal playgroups, in a preschool classroom, or with a variety of other groups of four- and five-year olds.

Do I need to use all of *I Can and I Will* or can the sections be used individually?

The parent workshop is designed to be useful on its own or as part of the rest of the curriculum. The second children's activity (about challenges) should not be attempted without the first (about the brain), though the brain activity could be used on its own. The family resources are intended to be used by parents who have some education about growth mindsets and persistence.

Can I use *New Shoes*?

New Shoes is included in this guide with the permission of the illustrator, Linhchi Tang. You may print and distribute it for use with this curriculum as long as you use it in its entirety and receive no profits from doing so. You may not use it in part only or remove the authors' names from the work.

Parent Workshop

The following two-part workshop is designed for parents with children of any age and can be delivered either as a stand-alone workshop or as the first component *I Can and I Will.* Each part of the parent workshop should take about an hour, with the second part occurring two to four weeks after the first.

Part 1 of the workshop provides parents with information about persistence and challenge-seeking and allows them to examine their own beliefs regarding innate abilities. Parents learn about how the brain changes while working hard on a problem and how a belief that abilities are malleable can lead to greater persistence and willingness to try new things. Parents practice rephrasing feedback and think about how they can apply this practice with their own children.

Part 2 (two to four weeks after Part 1) allows parents to discuss their successes and challenges with the material and help one another resolve difficulties. Parents then learn how to apply the material to social situations and how to attribute the actions of others to causes other than fixed innate qualities.

When used as part of the curriculum, the first workshop should be implemented with parents *before* the rest of the curriculum is implemented with the children. This allows parents to support their children in their new learning and reinforce the messages in the lessons. When used in this way, parents should also be made aware of the curriculum in which their children will participate so that they can be more effective partners in their education. The second part of the workshop should be implemented after the children's activities.

Parent Workshop Part 1

Although **the goal is for parents to adjust the feedback that they give to their children**, being explicit about this goal with parents may be counterproductive. Delving into issues of parenting and the parent-child relationship is a deeply personal subject that can cause some people to feel defensive. Therefore, removing the focus from parent-child speech and placing it on a third party can help parents be more receptive. Instead of talking about the effects of parental speech, talk about the effects of the feedback provided by teachers, the education system as a whole, grandparents, coaches, and others. Instead of practicing ways for parents to adjust their own speech, practice ways they can rephrase the feedback children will receive from other sources. The result is that parents will learn ways to promote persistence in their children through the feedback they provide without feeling that their parenting has been attacked.

Have parents use notecards before the workshop to write about a time when their child gave up easily or refused to try something they thought might be challenging. At the end of the workshop, the parents should use the notecard to write what they plan to say should the situation arise again. This will provide parents with some useful practice that relates directly to their own child.

Take care to ensure that parents thoroughly understand the psychology behind how the two mindsets tend to produce the results at the bottom of the chart on the first page of the parent hand-out. Parents will be unable to adjust their feedback if they do not understand the logic behind its effects. The practice section on the third and final page of the handout can be done in pairs, in groups, or individually and then shared out with the whole group.

The three-page handout that follows contains all of the information for Part 1.

Perseverant Learners

Best predictor of success in pretty much any arena is not IQ or talent – it's GRIT.

Gritty, perseverant people hold these mindsets:

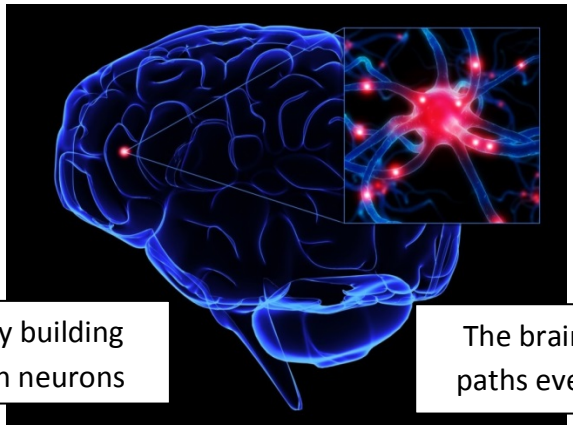
- I belong here
- I can improve* ← current focus
- I can succeed
- This has value

Fixed Mindset	Growth Mindset
Intelligence is fixed and you can't do anything to increase it	While not everyone has the potential to be Einstein, intelligence is something that can be improved through effort
Some people are artistic/athletic and others are not	Artistic/athletic ability is something that comes through hard work and practice
Some people are good with people and others are not and there is not much they can do about it	Social interaction is a skill that must be learned and maintained
There are good people and bad people	No one is truly good or bad
If you have to try hard at something, it means you're not good at that thing	If you have to try hard at something, it means you are learning more than someone who didn't exert much effort
If you can complete a task quickly (and accurately), it shows you are good at it	Working slowly and carefully and persisting after failures allows you to learn a task on a deeper level
Leads to…	Leads to…
avoiding challenge	seeking out challenges as learning opportunities
attributing setbacks to their own lack of ability or other noncontrollable factors	attributing failure to not putting in enough effort or using the wrong strategy
giving up easily	persisting in the face of set-backs
Feeling threatened or jealous of other people's success	Feeling inspired by other people's success
Plateaus in ability	Ever increasing ability
Believing bad deeds indicate a bad person (young children)	Trying to set social conflicts right

For more information, see Carol Dweck's *Mindset* (2006) and Angela Duckworth's TED talk, 5/9/2013

Science Supports the Growth Mindset

Neuroscience tells us why talent and IQ are poor predictors of success and why *we can always improve our abilities with effort. Look at how the brain learns:



The brain learns by building pathways between neurons

The brain can build new paths even in adulthood!

Working through **questions**, **problems**, and **mistakes** is what causes the brain to learn –
not performing a task quickly or effortlessly.
Struggle, Fail, and Persist!

How do you help your children embrace challenges and persist?

1. Teach them about the brain (see above)

2. Problems, set-backs, failures, and mistakes are **normal and happen to everyone!**

Celebrate those mistakes instead of only focusing on successes.

Talk about struggles faced by your family and friends and how those people worked to overcome them - your family is a family that doesn't give up when things don't work out. We can help each other figure out how to deal with the problem.

Keep them optimistic. Change **"I can't do it - Y E T "**

3. Provide feedback that emphasizes **process, effort, progress, strategies, and learning** rather than the person, their abilities, ease, product, correctness, or speed.

Practice Growth Feedback

The following feedback cultivates a fixed mindset. Try to change it to emphasize that **set-backs happen to everyone** and focus on the **process, effort, progress, strategies, learning, and brain development.**

(And remember to only give **sincere** praise.)

~~"You're so smart/talented"~~ →

~~"You got a terrible grade"~~ →

~~"You did it on your first try"~~ →

~~"You're just not good at math"~~ →

~~"Girls are good at x"~~ →

~~"You can't do it"~~ →

Parent Workshop Part 2

After parents have had two to four weeks to practice the material from Part 1, gather again for the second workshop. Ask parents to bring back their handouts, but be sure to have extra in case people forget.

Begin with an open discussion about the progress that parents have been making with the material. Have they found it useful or relevant? Have they been able to use it in conversations with their children? Have their children been receptive? Have they struggled with the material? The first half of the workshop should focus on allowing parents to help one another with their challenges and reinforcing the content from Part 1.

The second half of the workshop should focus more on the social applications of the concepts. How do we talk with our children about the actions of other people? Do we assign them fixed qualities when our children experience social disappointments (“That person is mean/selfish/no good”). Help parents practice attributing social conflicts to specific situations rather than to the fixed personal qualities of any party.

Preschool Lesson 1 – Your Learning Brain

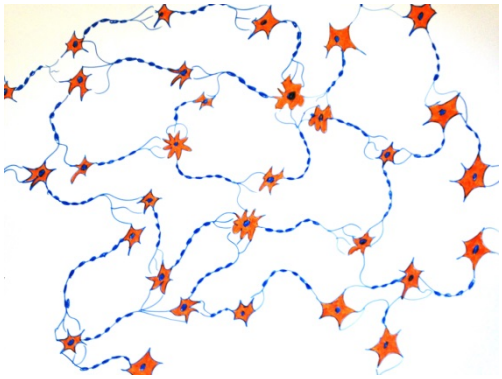
The goal of this lesson is for children to understand that their brains become stronger when they work hard on a problem – especially when they need to try multiple times before they succeed. The image of two neurons building a stronger and stronger connection between them is a powerful reminder for children to think back on later, but the same results could be obtained another way, as long as the core message of the brain increasing its strength is maintained.

Learning is reinforced with families through two activities. First, children draw pictures at home to bring the following week. Be sure to communicate with parents about the content and purpose of these drawings so they can support their children's learning. Second, create a video of the students explaining what they have learned "so that other kids can understand the brain as well." The purpose is not actually to teach other children, but rather to reinforce the message for your own students. After editing the video, send it to parents to view at home with their children and encourage them to have their children explain it to family members.

Materials:

- ✓ Brain toy or prop that children can hold and feel
- ✓ Visual representation of a neural network (such as a drawing on a poster board – see example below)
- ✓ Brain area (something children can sit on and pretend it's a brain, such as a blanket)
- ✓ Physical representation of two neurons that can form a connection (such as toy neurons or small multi-branched sticks and some thread)
- ✓ Video camera

Visual representation of a neural network drawn on a poster board to emphasize connections between neurons rather than anatomical accuracy



The following example shows one implementation of the activity and the rationale for doing it this way. Examples of the words used by the educator are given below, but each educator should modify the activity to best fit his or her students.

1. Introduce the Brain

- *Sing:* "Head, Shoulders, Knees, and Toes" *(Get their attention, have them start thinking about their bodies)*

- What is in your head? *(Possible responses: skull, brain)*

- *Give them the toy brain to manipulate to help them understand what a brain is.*

- What does the brain do? *(Access their prior knowledge. Possible responses: think, remember, learn, control your body, help process sight/sound/smell, feelings, etc.)*

- Use your brain now to… jump, wiggle arms, make silly faces, etc. *(Let them move around and stay interested)*

- *Show neural network visual:* Inside your brain are billions of tiny things called neurons all sending information to each other. Whenever your brain does anything, it has to send information between the neurons.

- Send information between your neuron now! Clap your hands! When you were babies, you couldn't do that because you had not connected your neurons yet to tell you how. You had to build that connection/pathway between the neurons. How did you do it? With Practice! *(An easily-accessible example of something babies can't yet do but they have accomplished)*

- When you practice something, it makes connections in your brain and your brain gets stronger.

- What are some things you had to practice to grow your brain connections? *(possible responses: walk, ride a bike, write letters)*

- The harder it is, the more you have to practice to grow your brain connections.

2. Take a trip into a brain

- Let's make ourselves really small to go inside a brain *(Let them move around and keep it interesting. Hold hands and say some magic words and then pretend to shrink. Have kids sit in the brain area)*

- What do you see in here?

- *Show them the toy neurons.* They want to talk to each other and send information to each other but they can't. Why? *(possible response: there is no connection/pathway between them)*

- This brain wants to learn how to make the body pat its head and rub its belly at the same time. How can we help it build that connection between these neurons so it can do that? *(possible response: practice, learn how)*

- *Have children take turns standing up and trying to pat their heads and rub their tummies. With each attempt, form a connection between the neurons (for example, have the child wrap a spool of thread one time around the neurons).*

- *Ask children to suggest different tactics to make the activity easier such as moving their arms more slowly or starting one hand before the other. Each child should have the opportunity to contribute to the growth of the brain pathway.*

- *Emphasize that as each child makes an attempt, even if unsuccessful, the connection between the neurons is still getting continually stronger because of the effort exerted. By the time each child has attempted it, the neurons should be well connected.*

3. Take the Message Home

- Think about something you have been practicing recently but can't do it perfectly yet. Maybe riding a bike, tying shoes, writing, reading.

- Close your eyes and imagine yourself practicing and your brain growing stronger, growing pathways.

- Practice that activity this week.

- When you come back next week, bring a drawing of you practicing and your brain growing stronger pathways.

- Did you know that some kids don't get to know about how the brain learns? We are going to make a video to tell them about it.

- *While children are engaged in other activities, interview them one at a time about what they learned and edit it together into a video for them to share with their families.*

Preschool Lesson 2 – Celebrating Mistakes

The goal of this lesson is for children to view mistakes and problems as learning opportunities. When they encounter a mistake or a problem, rather than becoming frustrated, they can see it as an opportunity to make their brains stronger. They will practice coming up with various strategies for solving problems and work together to persist.

One important part of taking on challenges and persisting is attributing failures to appropriate causes. This activity teaches children how to attribute set-backs to lack of effort, inappropriate strategies, or sometimes elements beyond their control. Talk to them about what would have been required to achieve success.

Allow children to share their learning with their families by shooting, editing, and sharing another video this week, but only for those children who would like you to record their challenges. Encourage parents to watch the video with their children and allow their children to explain it.

Materials

- ✓ Video of children talking about the brain
- ✓ Visual representation of a neural network from lesson 1
- ✓ Physical representation of two neurons from lesson 1
- ✓ Educator's unrecognizable attempt at creating a drawing as was assigned during the last activity
- ✓ Play space
- ✓ Video camera

The following example shows one implementation of the activity and the rationale for doing it this way. Examples of the words used by the educator are given below, but each educator should modify the activity to best fit his or her students.

1. Brain Review

- *Collect drawings from children as they arrive. Have them explain their drawings, preferably with some of their peers listening, then post their drawings where everyone can see them.*

- *Some children may not have seen the video from the last lesson. Show those children the video and any other interested children to help remind them about the brain.*

- *Show children the neural network visual and the neurons and have them recount the information they learned about brains from the last lesson. Show them their drawings of them strengthening their brains and discuss them.*

2. Mistakes

- Have any of you ever made a mistake? Think about a mistake that you have made *(Access prior knowledge. Allow them to share).* How did you feel when you made that mistake? *(Spend time naming the feelings that often arise: frustration, sadness, etc. This helps them see that these feelings are normal and universal.)*

- Has anyone read any books about making mistakes or solving problems? *(Hopefully some children have been reading* New Shoes *and mention it. Encourage them to talk about it if necessary)*

- I made a mistake. I was trying to draw a picture of my brain getting stronger and I messed up! *(This shows them that everyone, even adults, make mistakes. Show the unrecognizable drawing and say what it was supposed to be)* First I got very, very frustrated because I didn't know how to solve this problem.

- Have you ever felt very frustrated or sad when something you were trying to do didn't work out? *(Allow them to share).* It's ok to feel sad or upset at times like that. But when you feel like that, it makes it hard for your brain to come up with a way to fix the problem!

- *Show the neurons trying to send information to each other. Have the neurons say things like "I want to build a connection with you but I can't while this brain is so upset!" "I'm so excited that we have a problem to solve and a chance to make a new connection, but we need this brain to stop being upset first."*

- It's ok to let yourself be sad or frustrated for a few seconds, and then you need to give your neurons a chance to build a new connection. So flip your brain to action

mode and get ready to make a plan! *(Keep them active and interested by having children make sad faces and practice changing them to "plan-making" faces)*.

- I'm really excited now that I made this mistake with my drawing because now I get to make a new connection in my brain! Will you guys help me make a plan? Let's build a connection together.

- First let's come up with a few ideas for how to fix my mistake. *(Coming up with different strategies is an important step for children to deal with problems. Have children generate possible solutions with the person next to them, then share out to the group).*

- *Try out at least one idea that you know will fail and discuss why it did not work. Emphasize the brain connection getting stronger even if the idea didn't work, and* ***help them attribute a failure to constructive causes rather than innate ability****. If children remain interested, keep trying strategies until you succeed.*

- Thank you for helping me make my brain stronger by coming up with ideas for how to solve my problem with my drawing. *Show the neurons being happy that they got to make a plan and try new things to make a stronger connection.*

3. Take on a Challenge!

- Today you get to work together to make your brains stronger. You are going to work together on something challenging. It can be whatever you want as long as it's not dangerous and not too easy. Why don't you want to try something easy? *(Possible response: That won't make your brain stronger)*.

- When you run into a problem, how can you help each other solve it? *(Possible response: Turn off the frustration and make a plan. Practice the faces again.)*

- Before you get up, think about what challenge you might try.

- Now tell the person next to you.

- You will try at least two different challenges today, so listen to what other people have thought of and decide which ideas you would like to try.

- *Call on children one at a time to discuss their ideas. Help children determine which ideas they will try first and ensure that everyone is working with at least one other person.*

- If you would like me to make a video of you working on your challenges, let me know.

As the children work together, help them practice coming up with different ideas for how to proceed, cheering each other on, and ***attributing their set-backs and failures to the specific situation rather than to innate ability.***

Book for Families – *New Shoes*

This book was developed as a way for families to indirectly address the content of *I Can and I Will* at home. Because some children may be resistant to information about persistence and frustration if it comes from their parents, this book offers families a way to discuss the information from a third party, less personal source. Parents should talk about the book as they read it with their children, but should take care not to try to drive the message home too forcefully. **The goal is for families to open up a dialogue about frustration, challenges, perseverance, and strategies for persistence and for children to see how one child dealt with these issues successfully.**

New Shoes

By Mimi Lockton

with illustrations by Linhchi Tang

This is David. David loves eating strange foods, throwing rocks in puddles to watch them splash, and laughing with his friends. But David has a problem.

His feet have grown and his old shoes don't fit him anymore. His old shoes had stripes and Velcro and he could run really fast in them.

His new shoes have laces that he cannot tie himself. Every time he wants to put his shoes on, he has to ask a grown-up to help him.

Sometimes they are busy and he has to wait and wait and wait. If only he could tie his own shoes, he could have more time to play outside!

“Mommy, can I learn to tie my shoes myself?” asked David one afternoon after he had been waiting a very long time for help with his shoes.

“Yes, you can! I’ll start to teach you,” she replied.

David’s mommy showed him how to cross the laces and send one around the back to make a knot. Then she showed him how to make a loop and bring the other lace around and through itself.

It was very tricky and the laces fell through his fingers in all the wrong ways.

“I can’t do this!” he groaned in frustration.
He threw the shoes down and decided to go
play with his inside toys instead.

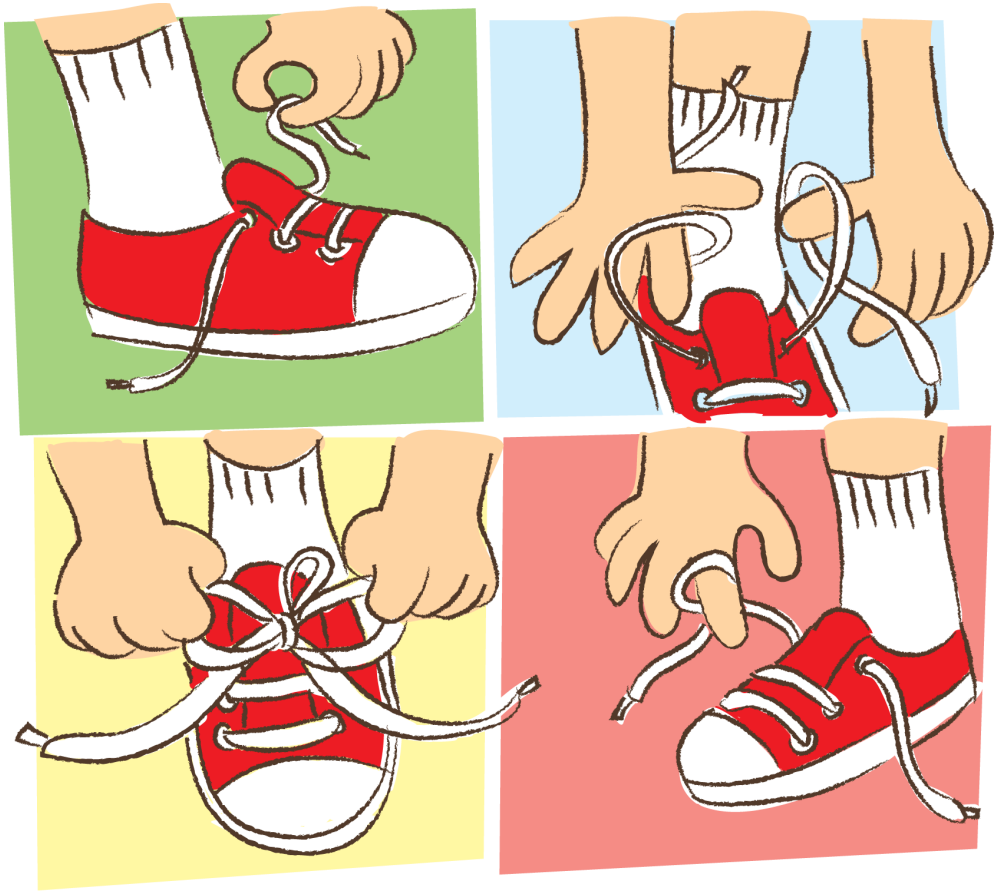
That night, his mommy tucked him into bed and gave him a kiss

“You know what, David?” she asked. “No one is good at tying shoelaces the first time they try. No one is good at it the second time either. Or the third. It takes many, many tries to learn to do it properly.”

“If I try many times, will I be able to tie my laces?” asked David.

His mommy hugged him. “If you try many times and learn from each mistake, you will keep getting better and better. Sometimes you will mess up, but if you keep working at it, you will learn.”

Over the next few days, David tried and tried and tried to tie his laces. His mommy showed him again and again. One time he almost did it perfectly and he was so proud! But the next time the laces went all the wrong direction again.



“Maybe I need to hold the laces a little differently in my fingers,” thought David. He tried that but it didn’t help. “Maybe I need to pull them a bit tighter,” he thought. He tried that and it definitely helped. Every time the laces slipped from his hands, he took a deep breath and tried again.

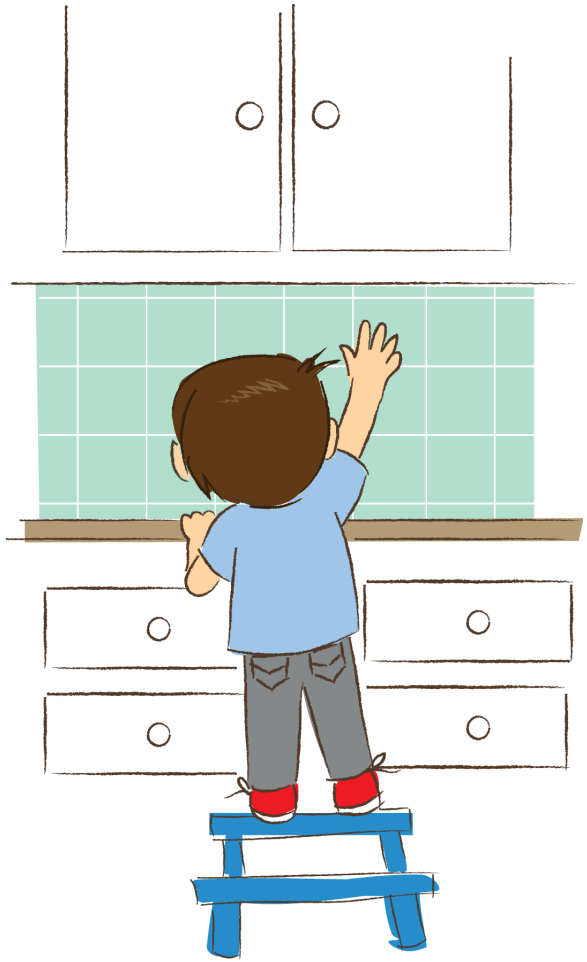
When he was tired, he took a break and did something else before trying again.

After several days, he discovered that he could get the laces to go in the right places more often than the wrong places.

It sometimes took him a few tries, but he could finally tie them by himself!

“Remember last week when you needed my help to put on your shoes?” asked his mommy.

David remembered. He also remembered all of the hard work he had done that week.



Now if only he could find a way to reach the sprinkles on the top shelf of the cupboard. They would taste great on eggs!

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