

What makes students with an incremental view feel smart? Engaging fully with new tasks, exerting effort to master something, stretching their skills, and putting their knowledge to good use, for example to help other students learn (see Bempechat & Dweck, 1983).

These are the kinds of things—effort and learning—that make incremental students feel good about their intelligence. Easy tasks waste their time rather than raise their self-esteem.

☐ A Different View of Self-Esteem

Self-esteem, we will see, is something completely different in the incremental system. It is not an internal quantity that is fed by easy successes and diminished by failures. It is a positive way of experiencing yourself when you are fully engaged and are using your abilities to the utmost in pursuit of something you value.

It is not something we *give* to people by telling them about their high intelligence. It is something we equip them to get for themselves—by teaching them to value learning over the appearance of smartness, to relish challenge and effort, and to use errors as routes to mastery.

In the following chapters I describe the consequences of the two theories of intelligence for motivation and achievement. But to understand the impact of the theories better, let us first take a closer look at what the theories create: the patterns of vulnerability and hardness that students display as they confront difficulty.

When Failure Undermines and When Failure Motivates: Helpless and Mastery-Oriented Responses

Of all the things that intrigued me when I began this work, none intrigued me more than this: Many of the most accomplished students shied away from challenge and fell apart in the face of setbacks. Many of the less skilled students seized challenges with relish and were energized by setbacks. How could this be?

But the story got even stranger. Many very skilled students questioned or condemned their intelligence when they failed at a task. Many of the less skilled students never even remotely entertained such thoughts.

You'd think that vulnerability would be based on the "reality" of students' skills. But it isn't. Vulnerability is not about the actual ability students bring to a task. If it's not about the reality of their skill, what is it about? What could cause bright students to think of themselves as dumb and fall apart just because they are having some trouble with a task? These questions led us to search for the processes that are at the heart of students' motivational problems.

☐ The Helpless and Mastery-Oriented Patterns

We started by identifying two distinct reactions to failure, which we called the *helpless* and *mastery-oriented* patterns (Diener & Dweck, 1978, 1980; Dweck, 1975; Dweck & Reppucci, 1973). Martin Seligman and Steven Maier (Seligman & Maier, 1967) first identified helpless responses in animals. In their research, some animals failed to leave a painful situation because they believed, erroneously, that the circumstances were beyond their control.

We used the term "helpless" to describe some students' view of failure—the view that once failure occurs, the situation is out of their control and nothing can be done (Dweck, 1975; Dweck & Reppucci, 1973).¹ We later extended the helpless response to include all the reactions these students show when they meet failure: denigration of their intelligence, plunging expectations, negative emotions, lower persistence, and deteriorating performance (Diener & Dweck, 1978).

We used the term *mastery-oriented* to refer to the hardy response to failure because here students remain focused on achieving mastery in spite of their present difficulties (Diener & Dweck, 1978, 1980).

Let us examine these patterns in action by taking a close look at the research that revealed them. In this research, by Carol Diener and me (Diener & Dweck, 1978, 1980), we gave fifth- and sixth-grade students a series of conceptual problems to solve. All children could solve the first eight problems, with hints or training if they needed it. But they could not solve the next four problems. These problems were too difficult for children their age, and so we could see how they reacted to this sudden obstacle. That is, we could see what happened to their thoughts, feelings, and actions as they confronted difficulty.

How did we do this? First, we could track changes in students' problem-solving strategies because the task we chose allowed us to pinpoint the exact strategy they used on each problem. So, we could look at the problem-solving strategies they used before the difficulty, compare them to the strategies they used after the difficulty began, and see if they showed improvement or impairment.

Second, we tracked changes in the thoughts and feelings they expressed while they worked on the task. We did this by asking them to talk out loud as they worked on the problems. We told them, "We're really interested in what students think about when they work on the problems. Some students think about lunch, some think about recess, some think about what they're going to do after school, and others think about how they're going to solve the problems." In other words, we gave them license to divulge any thoughts and feelings no matter how seemingly inappropriate. And they did. As with the strategies, we could see the changes in what they talked about before and after the difficult problems began.

We also asked students a number of questions after the difficult problems—for example, how well they thought they would now do if they went back to the original success problems, and how many problems they remembered getting right and wrong.

When we examined the students' strategies, along with the thoughts and feelings they expressed, we could see two dramatically different reactions.

But first I should explain a few things. One is that before the experiments we divided the students into two groups: those who were likely to show the helpless response and those who were likely to show the mastery-oriented response. We did this by asking them to fill out a questionnaire (Crandall, Katkovsky, & Crandall, 1965); we knew from our past research that this questionnaire could predict who would show persistence versus nonpersistence in the face of failure (Dweck, 1975; Dweck & Reppucci, 1973; see also Weiner & Kukla, 1970). But now we wanted to see whether it would predict a whole array of mastery-oriented and helpless responses.

Second, in all of our studies that involve any difficulty, we take elaborate steps to make sure that all students leave our experiment feeling proud of their performance. We have worked out detailed procedures for giving students feelings of mastery on the difficult tasks. To begin with, we explain to them that the failure problems were in fact too difficult for them because they were actually designed for older children. Because they had done so well on the earlier problems, we wanted to see how they would do on these. We then carefully take them through to mastery of the difficult problems, praising their effort and strategies—which, we will see, is what fosters master-oriented responses. This procedure, of course, varies somewhat from study to study, but in all cases we go to great lengths to ensure that students interpret their experience as one of mastery.

Finally, you may be curious about what percentage of students tend to show a helpless response and what percentage tend to show a mastery-oriented response. The answer is that it's about half and half. There are some students in the middle (maybe 15%) who don't really fit into either group, but aside from that the remaining students divide pretty equally between the helpless and mastery-oriented groups. This is true for all of the studies I discuss throughout the book. I am never talking about a few extreme students. I am talking about almost everyone.

□ The Helpless Pattern

When we monitored students' problem-solving strategies and their statements as they went from success to failure, two very distinct patterns emerged. Let's look first at the group showing the helpless response and examine their thoughts, their feelings, and their performance.

Maybe the most striking thing about this group was how quickly they began to denigrate their abilities and blame their intelligence for the failures, saying things like "I guess I'm not very smart," "I never did have a good memory," and "I'm no good at things like this." More than a third of the students in this group spontaneously denigrated their intellectual ability; none of the students in the mastery-oriented group did so.

What was so striking about this was that only moments before, these students had had an unbroken string of successes. Their intelligence and their memory were working just fine. What's more, during these successes their performance was every bit as good as that of the mastery-oriented group. Still, only a short while after the difficult problems began, they lost faith in their intellect.

And they did so to such a degree that over a third of the children in this group, when asked whether they thought they could now solve the *same* problems they solved before, did not think they could. The students in the mastery-oriented group *all* were certain they could redo the original problems, and many of them thought the question itself was a ridiculous one.

Not only did the children in the helpless group lose faith in their ability to succeed at the task in the future, but they also lost perspective on the successes they

had achieved in the past. We asked the students to try to remember how many problems they had solved successfully (there were eight) and how many problems they had not (there were four). Thus the correct answer was that there were twice as many solved problems as unsolved ones.

But students showing the helpless response were so discouraged by the difficulty that they actually thought they had more failures than successes. They remembered only five successes, but they remembered six failures. That is, they shrank their successes and inflated their failures, maybe because the failures were so meaningful to them. The mastery-oriented group recalled the numbers quite accurately.

Thus, the students showing the helpless response quickly began to doubt their intelligence in the face of failure and to lose faith in their ability to perform the task. To make matters worse, even the successes they had achieved were, in their minds, swamped by their failures.

How did they *feel* about the whole situation? When we looked at the emotions they expressed during the task, we again saw a rapid change with the onset of failure. These students had been quite pleased with themselves, the task, and the situation during the successful trials, but they began to express a variety of negative feelings once they began having trouble with the task. Many claimed they were now bored, even though they had been happily involved only moments before. Two thirds of the students in the helpless group expressed notable negative affect; only one student in the mastery-oriented group did so.

We also began to note some very interesting ways these students had of dealing with their anxiety and self-doubt. For example, one child, in the middle of the failure problems, stopped to inform us that she was soon to be an heiress, and another reported that she had been cast as Shirley Temple in the school play. In other words, they tried to call attention to their successes in other realms.

Other children in this group tried to distract attention from their failures in an equally novel way: They tried to change the rules of the task. Since they did not seem to be succeeding on the task as we defined it, they would make it into a different game and succeed on their own terms. One boy, for example, kept picking the same wrong answer (a brown object) because, he kept telling us, he liked chocolate cake.

In other words, these students were no longer applying themselves to the problem at hand.

Not surprisingly, we saw big drops in the performance of this group. On the success problems, all of them had been using sophisticated and effective problem-solving strategies for children their age. In fact, they were every bit as good at the task as the mastery-oriented students. But during the difficult problems, two thirds of them showed a clear deterioration in their strategies, and more than half of the children in the helpless group lapsed into completely ineffective strategies. For example, they would just keep making wild guesses at the answer instead of using the information they were given. Or they might just keep choosing the answer on the right hand side. Or, like the boy described above, they kept picking answers for personal reasons that had nothing to do with the real task. These are strategies that preschool children might use, not fifth graders. And they are not strategies that would have allowed them to solve even the eas-

ier problems they had solved earlier. In short, the majority of students in this group abandoned or became incapable of deploying the effective strategies in their repertoire.

But wasn't this in some ways a realistic and even adaptive reaction to the failure problems? Weren't they in fact too difficult to be solved by these students? The trouble with this "helpless" response was, first, that these children gave up trying far too quickly, before they had a real idea of what they were capable of doing. The second, even more important, thing was that they did not simply decide in an objective manner that the task was too hard: They condemned their abilities and fell into a depressed or anxious mood. These ways of dealing with obstacles make the helpless response a clearly less adaptive one.

What's more, in other studies we gave students readily solvable problems after the difficult ones (e.g., Dweck, 1975; Dweck & Reppucci, 1973). In fact, we gave them problems that were almost identical to problems they had solved earlier in the session. Yet, students in the helpless group were less likely to solve these problems than the students in the mastery-oriented group. This was true even though everyone was highly motivated to solve the problems. In some of these studies (Dweck, 1975; Dweck & Reppucci, 1973) we made absolutely sure that students were eager to solve the problems by having them work toward very attractive toys that they had personally selected.

These findings show that the helpless response is not just an accurate appraisal of the situation. It is a reaction to failure that carries negative implications for the self and that impairs students' ability to use their minds effectively.

□ The Mastery-Oriented Pattern

The mastery-oriented response stands in stark contrast. Let's begin by looking at how these students understood the difficult problems. We saw that students in the helpless group blamed their intelligence when they hit failure. What did the students in the mastery-oriented group blame? The answer, which surprised us, was that they did not blame anything. They didn't focus on reasons for the failures. In fact, they didn't even seem to consider themselves to be failing.

Certainly, they had bumped up against difficulty, but nothing in their words or actions indicated that they thought this was anything more than a problem to be tackled. So, while the students in the helpless group had quickly begun questioning their ability (and had quickly lost hope of future success), students in the mastery-oriented group began issuing instructions to themselves on how they could improve their performance.

Some of these were self-motivating instructions: "The harder it gets, the harder I need to try," or "I should slow down and try to figure this out." Some of these were more oriented toward the cognitive aspects of the task, such as reminding themselves of what they had learned so far about the problem they were working on.

Almost all of the students in the mastery-oriented group engaged in some form of self-instruction or self-monitoring designed to aid their performance; almost none of the students in the helpless group did this. So, in response to obstacles the mastery-oriented group just dug in more vigorously.

They also remained very confident that they would succeed, saying things like "I've almost got it now" or asking for a few more chances on a problem because they felt sure they were on the verge of getting it. About two thirds of the students in the mastery-oriented group—but virtually none of the students in the helpless group—issued some sort of optimistic prediction.

How did they feel? This group tended to maintain the positive mood they had displayed during the success problems, but some of them became even happier about the task. We will never forget one young man, who, when the difficult problems started, pulled up his chair, rubbed his hands together, smacked his lips, and said, "I *love* a challenge." Or another, who as the difficulty began, told us in a matter-of-fact voice "You know, I was *hoping* this would be informative." Or another child who asserted cheerfully, "Mistakes are our friend."

For us, it was as though a lightbulb went on. We had thought that you coped with failure or you didn't cope with failure. We didn't think of failure as a thing to embrace with relish. These students were teaching us what true mastery-oriented reactions were.

So, far from lamenting their predicament, the mastery-oriented students welcomed the chance to confront and overcome obstacles.

How did they perform? In line with their optimism and their efforts, most of the students in this group (more than 80%) maintained or improved the quality of their strategies during the difficult problems. A full quarter of the group actually improved. They taught themselves new and more sophisticated strategies for addressing the new and more difficult problems. A few of them even solved the problems that were supposedly beyond them.

This response stands in clear opposition to the helpless response, where students took the difficulty as a sign of inadequacy, fell into a sort of despair, and remained mired in it. The mastery-oriented students, recognizing that more would be required of them, simply summoned their resources and applied themselves to the task at hand. Thus, even though they were no better than the helpless children on the original success problems, they ended up showing a much higher level of performance.

Were they fooling themselves by remaining optimistic on a task that was essentially beyond them? As I mentioned, some of them actually mastered the task through their efforts. But that aside, what did they have to lose by trying? What did the effort cost them? Not much, because—and this is crucial—they were *not seeing failure as an indictment of themselves*, and so the risk for them was not great.

For the students in the helpless group, however, their whole intelligence, and perhaps their self-worth, seemed to be on the line, with each unsuccessful effort undermining it further (see Covington, 1992). There, the risk could hardly be greater.

□ Helpless and Mastery-Oriented Responses in the Classroom

After spelling out the helpless and mastery-oriented patterns, we wanted to make sure that these patterns actually affected students' learning in school. We wanted to be completely sure that we were not just creating and studying a labo-

ratory phenomenon, and so we devised a new unit of material for students to learn in their classrooms: "Psychology: Why We Do the Things We Do."

In this study by Barbara Licht and me (Licht & Dweck, 1984a), we identified fifth-grade students who were likely to show the helpless response and those who were likely to show a mastery-oriented one, again by means of a questionnaire. Then, some time later, in their classes, we gave these students instructional booklets that guided them through the new material.

How did we check for a helpless response? Half of the booklets had confusing patches near the beginning. The question was whether students who were prone to the helpless response would be hampered in their learning after they experienced the confusion.

We looked for a subject to teach the students that would be different from anything they had learned in school. We didn't want them to come to the task with preconceived notions about how good they were in that subject. We also wanted to teach them something that they could later use to solve problems we gave them, so that we could test their mastery of the material.

What we taught them were some of the principles of learning. They learned, with amusing examples and illustrations, that if they did something (like going dancing) and a good thing resulted (like having a good time), then they were likely to do that same thing again. Similarly, they learned that if they did something (like eating some food) and a bad thing resulted (they got sick), then they'd be less likely to repeat the behavior. Finally, they learned that a big good thing outweighed a small bad thing (and a big bad thing outweighed a small good thing) in determining whether they were likely to repeat the behavior.

At the end of the booklet was a seven-question mastery test. We considered students to have mastered the material if they got all seven questions correct, since the questions were fairly direct ones that stuck close to the material we had presented. If students did not demonstrate mastery on the first booklet, they were given a review booklet and another mastery test.

We took steps to prevent students from perceiving the review booklets as meaning they had failed. When a review booklet was necessary, the experimenter said to the child in a friendly, nonevaluative tone: "You didn't *quite* get it all yet, so I'd like you to review this. I put an 'X' back here by the kind of question(s) that you missed. So pay special attention to that (those) question(s). But I'd like you to review it all again." Altogether, students had four opportunities to master the material.

To see how the helpless response would affect learning we made two different versions of the initial instruction booklet—one that contained difficulty and one that did not. In both versions, near the beginning, we inserted a short section of irrelevant material, namely, a passage on imitation. In one version, the passage was written in a clear, straightforward way, but in the other it was written in a muddy and tortuous style, a style that looked comprehensible on the surface but was quite confusing. Here is a sample of the confusing passage:

How can one best describe the nature of the people who will most of all be that way which will make the imitating of others happen most often? Is it that these are the people we want to be like because they are fine or is it that these are the people we want to be liked by?

Now, this passage had nothing to do with the real material the students had to learn, and so the confusing passage did not rob them of any information they needed to solve the mastery problems later. But it allowed us to see how confusion at the beginning of a new unit would affect learning for students who were prone to a helpless response.

The results were striking. When students received booklets that had no confusion, those who were prone to a helpless response and those who were prone to a mastery-oriented response looked pretty much the same. Over two-thirds of the students in both groups mastered the material during the session: 76.6% of the helpless group and 68.4% of the mastery-oriented group got the seven mastery questions correct—not a significant difference. This is right in line with our previous findings that before failure occurs the two groups of students seem to have equal ability at the tasks we give them. In this study we also had the IQ and achievement-test scores of the students, which again showed the two groups to be equivalent in their current academic skills.

However, when students got the booklet with the confusing passage, the two groups looked very different from each other. The mastery-oriented students still looked good, with 71.9% of them mastering the material. However, the students in the helpless group clearly suffered from their confrontation with confusion: Only 34.6% of them were able to master the task. This means that many students who had the necessary skills failed to learn the material because they couldn't cope with the initial confusion, the same confusion that didn't disrupt the mastery-oriented group one bit.

One reason we chose a confusing passage as the way to present an obstacle was that new units may pose just this kind of obstacle, especially as students go on in school. For example, as students move on from arithmetic to algebra, geometry, or trigonometry, new concepts and new conceptual frameworks are being introduced. Students may have no idea how these new concepts relate to what they learned before, and they may find themselves in the dark for a while.

Students prone to the helpless pattern may easily react with self-doubt and disruption, deciding prematurely that they aren't any good in the subject. This would put them at a real disadvantage as school progresses, especially in areas of math and science that really ask the student to enter a new conceptual world.

This study showed that a helpless response could hamper learning of new material in a classroom setting, and made it even more important for us to understand the underlying causes of the helpless and mastery-oriented responses.

□ Some Thoughts About the Two Patterns

I have been stressing the fact that the helpless and mastery-oriented groups are equivalent in the cognitive skills they bring to a task. The reason they may end up displaying such different levels of performance is that one group essentially refines its skills in the face of failure, while the other continues to use them vigorously.

Why is it difficult for us—and often for teachers—to realize that very bright students may display this pattern? Perhaps because much of the work bright

students receive is relatively easy for them and they are usually able to avoid really confronting difficulty. Then why should we be concerned? The reason is that sooner or later everyone confronts highly challenging work, if not in grade school, then certainly at some point later on. Rather than meeting these challenges head on, helpless students may suffer unnecessary self-doubt and impairment.

Equally important, students are confronted with more and more choices as they go on in school (Eccles, 1984). The choices that ensure ready success and avoidance of failure are likely to be limiting ones.

It is also important to realize that the helpless response, if it is a habitual response to challenge, will not just limit students' achievement of tasks that others give them. It will limit their achievement of their own goals. All valued, long-term goals involve obstacles. If obstacles are seen as posing a real threat and if they prompt grave self-doubts and withdrawal, then pursuit of these goals will surely be compromised.

If, on the other hand, difficulty is treated as a natural part of things and challenge is welcomed, how can this help but foster the achievement of goals?

The effectiveness of a mastery-oriented approach was dramatically illustrated in the following conversation I overheard between two undergraduates I'll call Charles and Bob. They were talking about a very challenging computer-science course, one that was meant to weed out the fainthearted. Charles had taken it twice, receiving a D the first time and a B+ the second. Bob was currently taking it and was expecting at most a C but was thinking that he too might take it over. They then went on to discuss whether they would major in computer science. Never once did either of them consider whether he might not be good in this subject. They simply saw computer science as a subject in which you had to work really hard and maybe retake some of the most challenging courses. Their decision about whether to major in it would rest, they decided, on how interested they were in it and how hard they were willing to work.

I had little doubt that if these young men did decide to pursue computer science they would succeed admirably. Yet I was amazed by this conversation. It was so different from how I was in college. If I had received a grade that was less than I had hoped for, I would never have dreamt of discussing it in public. Moreover, if I had ever received a C or D in a course, I would never in a million years have considered majoring in that subject. I'm sure that my interests would have immediately shifted elsewhere. I admired Charles and Bob greatly for keeping their options open and for recognizing that with continued effort they could master skills they valued.

Are we saying that dogged persistence is always the best strategy? Not really. While recognizing the importance of confronting obstacles, we can also recognize the importance of knowing when to opt out of a task—say, when it is truly beyond someone's current capabilities or when the cost of persisting is too great (see Janoff-Bulman & Brickman, 1981, for a cogent discussion of these issues).

The mastery-oriented response is one that allows persistence, but it does not force anyone to persist when a rational analysis suggests doing otherwise. In fact, overpersistence can in some ways be more like the helpless response. Some may refuse to give up because an admission of defeat is too great a blow to their ego.

Richard Nixon, in the wake of the Watergate hearings, was facing almost certain impeachment and conviction. Yet for a long time he refused to give up his presidency, saying, "You're never a failure until you give up." He was equating giving up not simply with failure but with *being* a failure.

In both cases—either getting out too quickly or staying in too long—the maladaptive response is based on the concern that failure spells serious personal inadequacy.

After we pinpointed the helpless and mastery-oriented patterns, a very important question remained: *Why* do students of equal ability have such dramatically different reactions to failure? As we will see in the next chapter, the belief that failure measures you is a key factor.

☐ Note

1. See also Heckhausen & Dweck, 1998; Heckhausen & Schulz, 1995; Rothbaum, Weisz, & Snyder, 1982; Rotter, 1966; Skinner, 1995; Skinner & Wellborn, 1994; Weiner & Kukla, 1970; Weiner, Heckhausen, & Meyer, 1972, for discussions of beliefs about control and their implications for coping.

Achievement Goals: Looking Smart Versus Learning

Why do some students react to an obstacle as though it's a painful condemnation, when others see the same obstacle as a welcome challenge? Maybe, we thought, achievement situations are about totally different things for different students. For some students, they are tests of their intelligence, and when they hit problems they're failing the intelligence test. For the others, the same situations are opportunities to learn new things.

So Elaine Elliott and I proposed that helpless and mastery-oriented students have different *goals* in achievement situations, and that these goals help create the helpless and mastery-oriented responses (Dweck & Elliott, 1983; Elliott & Dweck, 1988; see also Dweck, 1986, 1990, 1991).

We identified two different goals. The first is a "performance goal." This goal is about winning positive judgments of your competence and avoiding negative ones. In other words, when students pursue performance goals they're concerned with their level of intelligence: They want to look smart (to themselves or others) and avoid looking dumb.

Sometimes students do this by playing it safe and completely avoiding mistakes. Other times they do it by taking on a harder task, but one they think they're pretty sure to do well at. Actually, the best tasks for purposes of looking smart are ones that are hard for others but not for you.

The other goal is a "learning goal:" the goal of increasing your competence. It reflects a desire to learn new skills, master new tasks, or understand new things—a desire to get smarter.¹

Both goals are entirely normal and pretty much universal, and both can fuel achievement (Ames & Archer, 1988; Elliott & Church, 1997; Harackiewicz, Barron, Carter, Lehto, & Elliott, 1997; Stone, 1998). All students want to be validated for their skills and their accomplishments. They also want to develop their skills and knowledge. So it's not that there is anything wrong with either kind of goal.