

Children Who Do Well in School: Individual Differences in Perceived Competence and Autonomy in Above-Average Children

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Self-determination theory and a motivational model of engagement were used to determine the impact of perceived competence and autonomy on engagement and performance in school of 77 3rd and 4th graders identified as above average in ability by scoring above the median on the Stanford Achievement Test. Despite this high ability, children who reported experiencing a lack of competence (those less certain of their abilities) or a lack of autonomy (being externally motivated) reported more negative affect and withdrawal behaviors than did children who perceived themselves as having ability or who perceived themselves to be autonomous. Implications for the achievement and adjustment of children in school are discussed.

Educators and psychologists alike have struggled with how to motivate and teach children who seem to be disengaged from the learning process. For example, research on goal theory approaches this problem by identifying goals held by children that may lead them to pursue goals that may or may not be optimum for learning (e.g., Dweck & Elliot, 1983; Nicholls, 1984). Other research focuses on classroom structures and how such structures can foster mastery learning (e.g., Ames, 1992; Blumenfeld, 1992). Yet, an additional approach is to look inside the child at the self-regulation process and to determine what the child needs to become oriented toward learning (e.g., Connell & Wellborn, 1991). A common theme running through these three approaches is that the performance level of the child is not necessarily predictive of the child's motivation. Children may perform at a high level for many reasons, not solely out of a desire to learn or because of a particular interest in the material at hand. Furthermore, ability, although necessary, is not sufficient for persistence and learning. The motivation behind the engagement may in fact be more important in understanding and predicting subsequent engagement and learning. This is the rationale behind self-determination theory and the motivational model of engagement (Connell & Wellborn, 1991; Deci & Ryan, 1991). In this article I report the results of a study of the engagement and motivation of children who perceived themselves to be

lacking in competence or autonomy despite having high ability.

Self-Determination Theory and the Motivational Model of Engagement

Self-determination theory is an organismic dialectical theory. It describes the continual process of how humans develop and grow. The dialectic occurs "between the active self and the various forces, both within and without, that the person encounters in the process of development" (Deci & Ryan, 1991, p. 239). The theory has focused on the results of this dialectical process on intrinsic motivation, internalization of social values, and the integration of emotion. This organismic process works for the satisfaction of three basic psychological needs: competence, autonomy, and relatedness (Connell & Wellborn, 1991; Deci & Ryan, 1985). The environment can foster or impair healthy human development to the extent that these three needs are supported or thwarted.

The need for competence is the need for being effective in one's interactions with the environment. The need for autonomy is the need to be self-determined and to have a choice in the initiation, maintenance, and regulation of an activity. The need for relatedness is the need to feel securely connected to others and the need to experience oneself as capable and worthy of love and respect (Connell & Wellborn, 1991).

The social context can facilitate the satisfaction of these needs (Connell, 1991). Competence is facilitated by the provision of structure: the communication of realistic expectations, consistent consequences, and competence-relevant feedback (Connell, 1991; Skinner, 1991). Autonomy is fostered by a context that provides autonomy support in the form of acknowledging the behavior's perspective, opportunity for initiative, and the provision of choice (Deci, Eghrari, Patrick, & Leone, 1994; Deci & Ryan, 1985; Ryan, 1982). Relatedness develops from the involvement of others in the context by their communication of interest in and

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enjoyment of the individual (Connell, 1991; Connell & Wellborn, 1991). The social context also can block the development of competence, autonomy, and relatedness by providing inconsistency or chaos, coercion, or neglect, respectively (Skinner & Wellborn, 1994).

To the extent that the social context supports these needs in an individual, that individual will be engaged within a particular context such as family, school, or work. Engagement will be manifested in energized behavior (e.g., initiation, effort, concentrated attention, persistence, and continued attempts in the face of difficulty or failure), positive emotion (enthusiasm, happiness, curiosity, interest), and orientation toward the goals of the enterprise (Connell & Wellborn, 1991). To the extent that the social context undermines these needs, an individual will show disaffection. Disaffection will be manifested by enervated behavior (e.g., avoidance, passivity, resistance, giving up, fleeing), negative emotion (boredom, anger, anxiety, fear), and an orientation away from the goals of the enterprise. The outcomes of engagement or disaffection are changes in the level of skills and abilities and psychological adjustment. Engagement leads to higher qualities of both, whereas disengagement leads to a decrement in skills and abilities and poor psychological adjustment (Connell & Wellborn, 1991).

The need for competence grew out of White's (1959) theory of effectance motivation and is contained in work on learned helplessness and depression (Abramson, Seligman, & Teasdale, 1978; Seligman, 1975; Seligman & Maier, 1967), self-efficacy theory (Bandura, 1977), explanatory styles (Peterson & Seligman, 1984), mastery-oriented and helpless children (Dweck, 1975; Dweck & Leggett, 1988), attribution theory (Weiner, 1986), and perceived control (Connell, 1985; Skinner, Chapman, & Baltes, 1988). All these views share the common belief that perceived competence consists of the individual's beliefs about ability, effort, and external factors such as powerful others or luck and that cause success or failure in school.

Self-determination theory (Deci & Ryan, 1985) and the motivational model of engagement (Connell & Wellborn, 1991) posit that children who believe that effort is an important cause and that they are capable of exerting effort believe that they have ability, believe that they have access to powerful others, and believe they are lucky tend to be actively engaged in classroom activities. By contrast, children who believe that they are incapable of exerting effort believe that they are not smart, believe that they have no access to the powerful others and luck, which they believe are necessary to succeed, or who do not know what it takes to do well in school often show disengagement in the classroom (Skinner, Wellborn, & Connell, 1990).

The need for autonomy was developed from previous work in the area of intrinsic motivation (cf. de Charms, 1968; Deci & Ryan, 1985; Harter, 1978). Extending this work, self-determination theory proposes that there are four styles of self-regulation (Deci & Ryan, 1985). These four styles are conceptualized as a continuum of autonomy from external to internal. The most external of these styles is *external regulation*, the most basic form of extrinsic motivation: behaving in order to attain a reward or avoid a

punishment administered by others, such as parents or teachers. Once the child has internalized such a regulation and applies approval or disapproval to his or her own actions, the child experiences *introjected regulation*. Essentially, the child is still acting in a controlled manner, even though the source of that control is an internal representation of the (originally) external agent of control. Once a child has accepted a regulation as his or her own and behaves in order to achieve a desired outcome, he or she is acting in a more autonomous manner and is described as experiencing *identified regulation*. In the final style of self-regulation, *intrinsic motivation*, the child is involved with an activity because of the inherent pleasure derived from the task itself. The behavior is freely chosen and totally autonomous.

Other Views of Engagement and Motivation

Goal Conceptions of Achievement Motivation and Classroom Structures

An alternative and complementary view of children's motivation and behavior in the classroom comes from the literature on achievement goals. According to Dweck and Elliott (1983), children may pursue learning-oriented or performance-oriented goals. Children with a learning goal seek mastery and competency at the task they are engaged in. Failure, or a negative performance under these conditions, provides valuable feedback to the child indicating that more effort or a different strategy is needed. By contrast, children with a performance-oriented goal seek to demonstrate their high ability or to gain favorable judgments of their ability via task performance. For them, failure or a negative evaluation undermines their motivation to sustain effort or to reengage at the task. Nicholls (1984) described similar effects on motivation for children who hold task-oriented and ego-oriented goals.

Building on this work, Meece, Blumenfeld, and Hoyle (1988) found that fifth- and sixth-grade children showed different engagement strategies depending on the kind of achievement goal they held. Children with learning goals showed more engagement in their schoolwork, as evidenced by the application of more active learning strategies. By contrast, children who strove to impress the teacher or to do better than their peers were less actively engaged in their schoolwork and instead applied effort-minimizing strategies. The results of this study provide evidence that children function better and learn when they are oriented toward mastery.

Furthermore, Ames (1992) reviewed extensive evidence demonstrating that the classroom environment can foster either mastery (learning) or performance goals in children as a function of instructor's teaching style and classroom structures. Task design and structure, performance evaluation, comparison among students, and teacher authority all affect a child's goal and hence motivation in the classroom. Students develop better learning strategies and are more highly motivated for school when mastery goals are salient

in the classroom (Ames & Archer, 1988). Blumenfeld (1992) extended Ames's (1992) review by expanding and clarifying the kinds of tasks, methods of evaluation, and authority structures that affect children's motivation.

Meece (1991) reported an intensive study of 15 lessons of each of five different elementary school science teachers that identified specific classroom structures that fostered motivation. In all five classes, the students had comparable ability and all assignments were of similar difficulty levels. Yet, teachers who had students with high task-mastery goals rather than ego-oriented or work-avoidant goals demonstrated great differences in their classroom behaviors. These teachers provided students with many opportunities to demonstrate their competence beyond traditional reading and writing assignments, adapted learning materials to the students' level of knowledge and understanding, provided opportunities to direct or to assume responsibility for their own learning, stressed the value of science in their lives, downplayed the significance of grades and evaluation, and deemphasized competition with others by fostering an environment of cooperation and collaboration.

This research on goal orientation and engagement complements the self-determination theory model of engagement. An important factor that determines which achievement goals children will hold is the attitude and behavior of the teacher and the structure of the classroom (Ames, 1992; Blumenfeld, 1992). According to Brophy (1983), children come to hold achievement goals on the basis of their perceptions of the teacher's ability to provide structure, support, and feedback, not solely on the difficulty of the task. In self-determination theory terminology, such a teacher is providing students with clear expectations and performance feedback in a context of involvement, which leads children to develop competence at classroom tasks and relatedness with an adult who cares about the child's welfare. Similarly, the teachers described by Meece (1991) provided children with the structure and feedback necessary to develop competence; the choice, lack of controlling grades, and information about the relevance of science to their lives necessary to develop autonomy; and the support of a caring teacher and cooperative peers, thereby meeting the child's need for relatedness. Indeed, Blumenfeld (1992) recognized a potentially undermining effect of having an overwhelming variety of tasks, inappropriate challenge, tasks not meaningful from the students' perspective, evaluation without the chance of improvement, and the allowance of choice and autonomy without adequate support.

Perceived Incompetence

The current study is consistent with the work of Phillips (1984, 1987; Phillips & Zimmerman, 1990) on perceived incompetence. Phillips (1984) found that highly competent fifth-grade children with low perceived competence set less demanding achievement standards and held lower expectations for success than children with average or high perceived competence. Furthermore, these children were rated by their teachers as being less persistent than children with average or high perceived competence. Similarly, Phillips

(1987) found that not only does the illusion of incompetence occur by third grade but that children's perceptions of their ability were influenced by parents' perceptions of their child's competence.

The current study complements Phillips's (1984, 1987; Phillips & Zimmerman, 1990) work, but it represents an important departure in three respects. First, students' perceptions and performance were measured over the course of the school year. Second, I made more specific predictions about engagement and disengagement and about performance using a motivational model of engagement (Connell & Wellborn, 1991). Finally, lack of autonomy was hypothesized to be an additional cause of lowered achievement.

The Current Study

Self-determination theory (Deci & Ryan, 1985) and the motivational model of engagement (Connell & Wellborn, 1991) and goal theory suggest that an individual's thoughts and emotions while performing an action are more important in determining subsequent engagement than the actual outcome of that action. For example, studies of intrinsic motivation have demonstrated that despite a positive outcome—success—on a task, participants lose interest if their autonomy is compromised by controlling feedback from the experimenter (Pittman, Davey, Alafat, Wetherill, & Kramer, 1980; Ryan, 1982) or pressure to win (Deci, Bentley, Kahle, Abrams, & Porac, 1981). When any of the three needs are thwarted, the individual is hypothesized to experience negative affect and to disengage from the enterprise despite the positive outcome. That is, outcome alone is insufficient to ensure continued progress or reengagement.

In the current study I focused on two of the three needs and hypothesized that otherwise able children will disengage from school if their competence or autonomy needs are unfulfilled despite having high achievement. Specifically, children identified as having above-average academic ability but who were uncertain of that ability (low perceived competence) and above-average children who were externally motivated (low perceived autonomy) would show a loss of interest, disengagement, and an eventual decrement in actual performance over the course of the school year. No gender differences in perceived competence or in autonomy were predicted in this sample of third and fourth graders.

Method

Participants

Participants were 77 above-average students (40 boys and 37 girls) from a suburban elementary school outside Rochester, New York. There were 56 from Grade 3 (age 8) and 21 from Grade 4 (age 9) distributed across 14 different classes (mean age = 9.51 years, $SD = 0.60$). The sample was representative of the school district, which was middle to lower middle class with a small minority population.

Children were identified as being above average in ability by selecting those children who scored above the population median of the Stanford Achievement Test (SAT) of all students ($N = 187$)

who took part in a longitudinal study conducted by the Brockport research group of the University of Rochester. The median composite grade equivalent score was 4.2 for the third graders and 5.4 for fourth graders. Thus, the above-average sample ($n = 77$) selected for study demonstrated ability over a full grade beyond their actual grade in school.

Measures

Participants were given the Rochester Assessment of Intellectual and Social Engagement (RAISE) in the fall of 1989. This is a composite of questionnaire measures assessing children's perceived competence, autonomy, perceived engagement or disaffection in school, and other variables not relevant to the current study. The 368-item questionnaire was administered on two separate 45-min sessions approximately 1 week apart in October of the school year. Administrations took place in the child's regular classroom at the scheduling convenience of the teacher; the teacher was not present during the actual administration. At the start of each administration, children were assured of the confidentiality of their responses. One trained interviewer read each question aloud while children followed along on their own questionnaires. A second administrator circulated in the classroom to answer any questions and to ensure that children were keeping up. Children were asked to rate all items on a 4-point Likert-type scale (1 = *not at all*, 2 = *not very true*, 3 = *sort of true*, 4 = *very true*).

Perceived competence. Participants' perception of their competence was assessed by the 6-item Capacity Ability scale administered in the RAISE measuring the extent to which participants believed that they possessed the ability to do well in school. This scale was taken from the Student Perception of Control Questionnaire (SPOQ; Skinner et al., 1990; Wellborn, Connell, & Skinner, 1989). Participants indicated how true the following statements were for them: "I think I'm pretty smart in school," "When it comes to school, I'm pretty smart," "I would say I'm pretty smart in school," "I don't have the brains to do well at school," "I'm not very smart when it comes to school work," and "When it comes to school work, I don't think I'm very smart." Responses to the last three items were reversed. Previous research has demonstrated an internal consistency for this scale of .76 (Skinner et al., 1988).

Perceived competence was operationalized in terms of the extent to which participants were certain or uncertain of their own ability. This operationalization of competence is narrower than both previous research within the current model of engagement (Skinner et al., 1990; Wellborn et al., 1989) and more traditional work in attribution theory (cf. Abramson, et al., 1978; Dweck, 1986), both of which emphasize the cumulative effects of attributions to ability, effort, powerful others, task difficulty, chance, and luck as causes of success or failure. My narrower operationalization came directly out of work on perceived fraudulence (Kolligian, 1990) and perceived incompetence (Phillips, 1984).

A median split was done on this capacity-ability variable on the basis of the median of the entire sample of high- and low-ability students ($N = 187$). Students at or below the median (i.e., those who were less certain that they had ability) were compared with those who scored high (i.e., those who perceived themselves to be certain of their ability for schoolwork). Using the median of the entire sample is a stricter criterion of uncertainty than using the median of above-average children, who are probably more certain of their ability than children with average or below-average ability.

Perceived autonomy. The extent to which children perceived themselves to be autonomously versus externally motivated for school-related activities was assessed with the Self-Regulatory Style Questionnaire (SRQ; Connell & Ryan, 1987; Ryan & Con-

nell, 1989) administered in the RAISE. The SRQ consists of four scales measuring each of the four styles of self-regulation of academic tasks in school (Deci & Ryan, 1985). The SRQ asks respondents to indicate the extent of their agreement with external, introjected, identified, or intrinsic reasons for doing academic tasks such as homework and studying. Scores on each of the four scales were standardized. Scores on the two scales representing externally controlled reasons for task involvement (External: 6 items, $\alpha = .78$; Introjected: 5 items, $\alpha = .75$) then were summed and subtracted from the summed scores on the two scales representing internalized reasons (Intrinsic: 6 items, $\alpha = .85$; Identified: 6 items, $\alpha = .61$). A positive number on this index indicates that participants are self-regulated, or autonomous, in their academic pursuits. Participants with a negative number are externally motivated. For example, when asked "Why do I do my homework?" participants with negative scores tended to endorse the item "Because I'll get into trouble if I don't" (external regulation) or "Because I'll feel bad about myself if I don't do it" (introjected regulation) rather than "Because I want to understand the subject" (identified regulation) or "Because it's fun" (intrinsic regulation), both of which were more often endorsed by autonomous participants.

Perceived engagement: Self-reported actions and emotions. Engagement, hypothesized to be manifested by active behavior and positive emotion, was assessed by items on the RAISE measuring the extent to which children reported acting in certain ways or feeling certain emotions in typical classroom situations. Concrete items with high face validity were converted into scales using exploratory factor analyses (see Wellborn, 1991, for confirmatory analyses).

The 37 action items and 36 emotion items were subjected to separate factor analyses and a promax rotation to reduce the items into structurally meaningful scales. On the basis of the responses of both high- and low-ability students ($N = 187$), the action items sorted into nine factors with eigenvalues greater than 1; seven were sufficient by the scree test and indeed were the only interpretable factors. Together, these seven factors accounted for 49% of the variance. The factors were as follows: Involved, Persisting, Avoiding, Ignoring, Helpless, Participating, and Concentrating (see Appendix A for items, loadings, and factors). The emotion items sorted into ten factors with eigenvalues greater than 1. However, five factors were sufficient by the scree test and were the only interpretable factors. Together, these five factors accounted for 47% of the variance. The factors were as follows: Curiosity, Anxiety, Anger, Enjoyment, and Boredom (see Appendix B for items, loadings, and factors).

Separate scores for each of the action and emotion factors were created by adding participants' responses for each of the scale items (items with negative loadings were reversed). Scores were then divided by the number of items so that all final scores could be interpreted on a 1-4 scale. Five of the 7 action scales and all 5 emotion scales showed adequate internal consistency. The alphas for the action factors based on the responses of all 187 participants were as follows: Involved (.76), Persisting (.77), Avoiding (.78), Ignoring (.76), and Participating (.62). Two of the factors, Helpless and Concentrating, were eliminated because of low internal consistency (.48 and .44, respectively). For the emotion factors, the alphas were as follows: Curiosity (.79), Anxiety (.72), Anger (.72), Enjoyment (.79), and Boredom (.79).

Outcomes. The outcomes of engagement, theorized by the motivational model as skills and abilities, were operationalized by students' grades in math, reading, language arts, spelling, and social studies as determined by their teachers during the first and last 10 weeks of the school year. Grades were obtained from the

students' official school record. This school system used a standard A–F letter grading system using pluses and minuses, which was translated into a 1–12 scale for analysis. A grade of A was coded as 12, A– was coded as 11, and so on; a grade of F was coded as 1.

Results

Multiple regression was used to test the hypothesis that children who are uncertain of their ability and children who are extrinsically motivated would each report negative affect, exhibit disengaged behaviors, and show decrements in performance of schoolwork over the course of the school year. Perceived competence scores and perceived autonomy scores were entered in separate regressions to predict each of the outcome variables. Repeated measures regressions were used to test the change in grades over the school year. In predicting grades, the effects of achievement test scores were controlled. Predicting grades when controlling for achievement scores allowed a test of the part of grades that was not attributable to innate ability but to motivation, thereby testing whether there would be differences in grades due to motivation and not to ability.¹ No gender differences were found in perceived competence or in perceived autonomy.

Perceived Competence

Identifying children uncertain of their ability. The above-average sample of students averaged 6.48 years on the subject composite of the SAT ($SD = 1.17$). Third graders averaged 6.36 ($SD = 1.24$); fourth graders averaged 6.81 ($SD = 0.89$). Of these above-average children, 30 scored at or below the population median on the competence measure, indicating that they were less certain they had ability ($M = 3.13$, $SD = 0.46$); 47 scored above the median, indicating that they believed that they had ability ($M = 3.92$, $SD = 0.12$). The difference between these two groups was significant, $t(75) = -9.16$, $p < .001$. More important, the two groups differed in SAT scores (mean ability = 6.71, $SD = 1.81$; mean doubt ability = 6.13, $SD = 1.07$), $t(75) = -2.20$, $p = .03$. That is, although all students were above average in ability, those who were less certain of their ability had SAT scores that were lower than those who were certain they had ability. Note that the mean SAT score of 6.71 indicates that these above-average third and fourth graders who were confident in their ability actually had the potential to achieve at nearly a seventh-grade level.

Perceived engagement: Self-reported actions and emotions. Separate multiple regressions were performed predicting each of the perceived action and emotion scales from the achievement test score and the competence score. Results indicate that students who believed in their high ability perceived that they were more curious and participated in, enjoyed, and persisted at school tasks more than those who doubted their ability. Students who doubted their ability perceived that they were more anxious, angry, and bored and reported ignoring, avoiding, and faking school-

work. Perceived competence was not a significant predictor of perceived involvement (see Table 1).

Outcomes: Grades. In a repeated measures multiple regression, perceived competence was a significant predictor of math and social studies grades when achievement test scores were controlled. Children who believed that they had ability received higher grades in the fall, in the spring, and across both times in both of these subjects.

Perceived competence was not a significant predictor of reading, language arts, or spelling grades. No significant differences were found in these grades between children who perceived themselves to be certain or uncertain of their ability (see Table 2).

Perceived Autonomy

Identifying externally motivated children. Of the 77 above-average participants, 50 reported being autonomously motivated for academic activities ($M = 1.11$, $SD = 0.70$), whereas 27 reported being externally motivated ($M = -1.01$, $SD = 0.78$). The difference between these two groups was significant, $t(75) = -12.14$, $p < .001$. The two groups did not differ on SAT score (mean autonomous = 6.24, $SD = 1.14$; mean external = 6.62, $SD = 1.17$), $t(75) = -1.34$, *ns*.

Perceived engagement: Self-reported actions and emotions. Separate multiple regressions were performed predicting each of the perceived action and emotion scales from the achievement test score and the autonomy score. Results indicate that students who perceived that they engaged in schoolwork for internal reasons reported more involvement, persistence, participation, and curiosity of school activities than did students who perceived themselves as externally motivated. Students who reported being externally motivated indicated feeling more anxious, angry, and bored while engaged in school activities and avoiding, ignoring, or faking their way in school more than did students who perceived themselves as being autonomous (see Table 3).

Outcomes: Grades. Perceived autonomous children received higher grades than did externally motivated children, as shown by a significant effect of perceived autonomy in the fall, in the spring, and across both times in the prediction of math, language arts, spelling, and social studies grades.

Perceived autonomy also was significant in predicting reading grades in the fall, but it was not a significant predictor of reading grades in the spring. Yet, in a repeated measures regression, the effect of autonomy across the school year was indeed a significant predictor of reading grades (see Table 4).

¹ Although it is argued that standardized tests of achievement measure something closer to innate ability than do grades, I acknowledge that there are numerous factors involved in achievement test performance, so this is an imperfect control of innate ability. Grades may be affected by the child's motivation (e.g., effort) and by nonmotivational factors (e.g., teacher liking, conforming to teacher expectations, bias).

Table 1
*Multiple Regression Prediction of Engagement Actions
 and Emotions by Stanford Achievement Test (SAT)
 Scores and Competence*

Engagement variable	Predictor variable	R ²	F(2, 165)	β	t
Curiosity	Model	.37	48.96***		
	SAT			-0.31	-1.99*
Anxiety	Competence	.26	29.81***	4.42	9.85***
	Model			-0.06	-0.81
Anger	SAT	.09	9.07***	-1.70	-7.11***
	Competence			0.13	1.00
Enjoyment	Model	.05	5.12***	-1.66	-4.25***
	SAT			-0.25	-2.67**
Boredom	Competence	.11	10.29***	0.67	2.47**
	Model			-0.02	-0.15
Involved	SAT	.01	1.19	-1.54	-4.29***
	Competence				
Persisting	Model	.11	9.96***	0.09	0.61
	SAT			1.68	4.05***
Avoiding	Competence	.23	25.04***	-0.64	-3.85***
	Model			-2.22	-4.56***
Ignoring	SAT	.18	18.45***	-2.22	-5.68***
	Competence			-0.05	-0.39
Participating	Model	.15	14.25***	-2.22	-5.68***
	SAT			0.05	0.81
Faking	Competence	.08	6.82***	0.95	4.81***
	Model			-0.06	-0.77
	SAT			-0.78	-3.23***
	Competence				

* $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

Perhaps the most surprising result of the entire study was that by third and fourth grade, there were meaningful differences in the autonomy and competence experienced by even above-average children. Those who perceived their ability with uncertainty reported feeling anxious, angry, and bored in school and reported avoiding, ignoring, and faking schoolwork. Those who reported feeling controlled in school also reported experiencing anxiety and anger as well as boredom, and they avoided or faked their way through their lessons.

By contrast, children who were certain of their ability reported feeling more curious and participated in, enjoyed, and persisted more at school tasks. Similarly, children who reported experiencing autonomy in school reported acting more involved, participating, and persisted more at tasks while in school and experienced curiosity while doing so.

Consistent with the current model (Deci & Ryan, 1985; Connell & Wellborn, 1991), the results suggest that experiencing an unfulfillment of the need for competence or

autonomy is associated with negative affect and avoidance behavior. When either competence or autonomy is perceived as unfulfilled, children report negative affect and withdrawal behaviors and ultimately show a decline in performance. More specifically, perceiving a lack of either competence or autonomy is associated with less involvement and persistence, more avoidance and ignoring behaviors accompanied by feelings of boredom and a lack of curiosity. Anger, anxiety, and less enjoyment are additional results when a child experiences a lack of autonomy.

Furthermore, perceived competence and autonomy predict changes in grades from the beginning to the end of the school year. This model also predicts that the effects of having one's needs met or not by the social context will magnify over time. That is, children who have their needs met by the social context and who are engaged in schoolwork may develop their skills and abilities, adjust well to school, and will come to hold further positive beliefs about their own competence and autonomy. However, children who are not getting their needs met by the social context and who have become disengaged from school may not develop their skills and abilities, show adequate psychological adjustment to school, and, according to the model, may eventually come to hold negative beliefs about their own competence and autonomy. Without intervention or a change of context, children's perceived competence and autonomy—even of high-ability children as identified in this study—will continue along these early trajectories.²

According to this motivational model of engagement, perceived competence consists of the individual's beliefs about ability, effort, powerful others, or luck in causing success or failure in school (Skinner et al., 1990). Belief in one's own ability is only one aspect of perceived competence. I targeted this belief in the current study because of previous work that has highlighted the importance of ability beliefs, most notably the work on perceived incompetence (Phillips, 1984) and the work on perceived fraudulence (Kolligian, 1990). The results for perceived competence are especially compelling in light of the narrower conceptualization of competence taken in the current study.

These results are surprising because these children's perceptions of lack of ability were so at odds with their achievement scores, yet the effects of their beliefs were strong. Perceived lack of ability did not predict all grades, but it did predict perceived engagement behaviors and emo-

² The term *classroom context*, as used by the motivational model of engagement, can refer to either classroom structure (Ames, 1992; Blumenfeld, 1982) or to teacher interactions one-on-one with the child. Although children may be in the same classroom, teachers also respond to an individual child's needs, so that the motivational context is not necessarily the same for all children. Teachers adjust their behavior to students' motivation, with the result that they magnify their students' initial levels of engagement (Skinner & Belmont, 1993). In the current study, such effects were indistinguishable from more general classroom structure effects. Furthermore, other researchers have found within-class variability in how students perceived the structure of the classroom (Marshall & Weinstein, 1986; Weinstein, Marshall, Brattesani, & Middlestadt, 1982).

Table 2
Multiple Regression Prediction of Grades by Stanford Achievement Test (SAT) Scores and Competence

Grade	Predictor variable	df	R ²	F	β	t
Math (fall)	SAT	2, 165	.12	11.71***	0.34	3.56***
	Competence				0.58	2.10*
Math (spring)	SAT	2, 165	.19	18.93***	0.43	4.78***
	Competence				0.60	2.32*
Math (repeated measures)	SAT	2, 165	.19	20.85***		
	Competence					5.90*
Reading (fall)	SAT	2, 166	.18	18.60***	0.53	5.47***
	Competence				0.27	0.96
Reading (spring)	SAT	2, 166	.15	14.92**	0.43	4.61***
	Competence				0.39	1.43
Reading (repeated measures)	SAT	2, 166	.15	30.03***		
	Competence					1.66
Language arts (fall)	SAT	2, 165	.17	17.11***	0.44	4.50***
	Competence				0.64	2.26*
Language arts (spring)	SAT	2, 165	.12	11.38***	0.41	4.26***
	Competence				0.23	0.82
Language arts (repeated measures)	SAT	2, 165	.12	22.47***		
	Competence					2.79
Spelling (fall)	SAT	2, 156	.06	5.27**	0.26	2.81*
	Competence				0.20	0.72
Spelling (spring)	SAT	2, 156	.03	2.64		
	Competence					5.85*
Spelling (repeated measures)	SAT	2, 156	.03	5.85*		
	Competence					0.73*
Social studies (fall)	SAT	2, 159	.11	9.58***	0.28	2.77**
	Competence				0.71	2.49**
Social studies (spring)	SAT	2, 159	.11	9.58***	0.29	2.98**
	Competence				0.94	3.39***
Social studies (repeated measures)	SAT	2, 159	.15	14.06***		
	Competence					9.91**
						10.37**

* $p < .05$. ** $p < .01$. *** $p < .001$.

tions as well as grades in mathematics and social studies across the school year. Because perceptions of ability did not predict grades in all classes, it is possible that children's beliefs about what it takes to do well in school may vary according to the subject matter and in higher grades in which children change classes such beliefs may vary with the teacher. Children in the current study might have perceived that ability is more important for success in mathematics, whereas other factors, such as effort may be more important for success in reading, spelling, and language arts.

By contrast, perceived lack of autonomy predicted engagement behaviors and emotions and grades in mathematics, reading, language arts, spelling, and social studies. An important question raised by these results is, Are the effects of lack of competence different from the effects of lack of autonomy? A detailed analysis of the differential effects of

perceived competence and perceived autonomy on the emotions and behaviors of children at all ability levels was conducted by Patrick, Skinner, and Connell (1993). Using similar measures and a sample of students that overlapped with that of the current study, they found evidence for the unique effects of perceived competence and autonomy and no interaction between the two in predicting engagement emotions and behaviors. Despite the similar general result of increased negative affect and withdrawal behaviors, the effects of perceived lack of competence were not redundant with the effects of perceived lack of autonomy (Patrick et al., 1993).

The difference between high- and low-perceived-ability groups, even by third and fourth grade as reported here, supports self-determination theory's premise that competence beliefs and autonomy beliefs come from different

Table 3
Multiple Regression Prediction of Engagement Actions and Emotions by Stanford Achievement Test (SAT) Scores in Autonomy

Engagement variable	Predictor variable	R ²	F(2, 165)	β	t
Curiosity	Model	.30	34.94***		
	SAT			-0.16	-0.99
Anxiety	Autonomy			1.86	8.31***
	Model	.31	36.78***		
Anger	SAT			-0.10	-1.26
	Autonomy			-0.87	-7.99***
Enjoyment	Model	.14	13.65***		
	SAT			0.12	0.91
Boredom	Autonomy			-0.93	5.22***
	Model	.05	4.59		
Involved	SAT			-0.01	-0.07
	Autonomy			-1.03	-6.52***
Persisting	Model	.05	4.06*		
	SAT			-0.07	-0.75
Avoiding	Autonomy			0.36	2.85**
	Model	.09	7.98***		
Ignoring	SAT			0.14	1.02
	Autonomy			0.70	3.54***
Participating	Model	.28	31.80***		
	SAT			-0.67	-4.18***
Faking	Autonomy			-1.27	-5.70***
	Model	.19	19.05***		
Faking	SAT			-0.11	-0.81
	Autonomy			-1.06	-5.78***
Faking	Model	.09	7.68***		
	SAT			0.10	1.47
Faking	Autonomy			0.31	3.22**
	Model	.06	5.46**		
Faking	SAT			-0.09	-1.11
	Autonomy			-0.32	-2.78**

* $p < .05$. ** $p < .01$. *** $p < .001$.

sources in the social context. Recall that the above-average group who had lower perceived ability also had lower SAT scores than did the group who perceived that they had ability (grade equivalent of 6.13 vs. 6.71). Although it could be argued that these children correctly perceived their lower ability, their average score was so far beyond their actual grade levels of second and third grade at the time of achievement testing that it is difficult to argue that these children did indeed have lower ability. Also, although the difference between the two groups was statistically significant, with such extremely high scores of both groups is the difference of practical significance? A more likely explanation is that by third and fourth grade, children have formed ideas about their own competence and that these ideas are already influencing their engagement in school activities.

Furthermore, it is possible that children are more sensitive to or more ready to process competence information than autonomy information. Perhaps a minimum level of competence at a specific activity is necessary before one can feel

autonomous in that action. Also, these competence and autonomy beliefs, although fostered by the context, are not solely dependent on success or failure at a task.

A limitation of the current study is that children's engagement emotions and behaviors were self-reported. Although this is clearly the most direct way of assessing internal states, a way of verifying the participants' reports would be to have observers rate the behavior and emotion of each child. In a study using similar students and self-reported measures, there were significant correlations between teacher-reported and child-reported behaviors and emotions in the classroom (Skinner & Belmont, 1993). This suggests that children can accurately report on their internal states and behaviors.

A major unresolved question and direction for future research is in determining where these ultimately self-defeating beliefs originate. Undoubtedly, children are aware of how others around them are doing and may adjust their perceived competence and perceived autonomy beliefs in line with social comparison information from peers. There is evidence that when such social comparison information is imposed as part of the classroom structure, students readily use this information in making judgments about their ability (Ames, 1984), so it would be reasonable for them to develop perceived autonomy beliefs in a similar way. Another way in which children develop perceived competence and autonomy beliefs is through the expectations that teachers communicate to their students.

However, the paradox still remains, How is it that otherwise capable children are uncertain of their ability? Do teachers and parents inadvertently squelch children's natural curiosity in the process of socialization? Although a certain amount of control is necessary for learning, too often classrooms and the structure of the school system unnecessarily control and restrict the child. A study by Koestner, Ryan, Bernieri, and Holt (1984) demonstrated that it is possible to set limits on children's behavior in an autonomy-supportive way without undermining their intrinsic motivation or creativity. Certainly, children cannot learn in a context of neglect or chaos, but they need structure and guidance to be provided by adults in a way that fosters their developing autonomy (see Ames, 1992, for a similar argument).

The results of this study have important implications for helping all children, regardless of their ability, to reach their fullest potential. Although it is tempting and perhaps necessary to focus time, energy, and resources on children at risk for failing in school or for dropping out of school, educators should not be so quick to assume that children achieving high grades are not susceptible to problems. Indeed, all children need to believe in their own ability, have their competence fostered, and regulate their own behavior in an autonomous way. Merely having ability or having potential is not enough to enjoy success in school or in life. Talent and potential will be wasted unless children believe that they possess ability and have the freedom to use and develop their talents.

Table 4
Multiple Regression Prediction of Grades by Stanford Achievement Test (SAT) Scores and Autonomy

Grade	Predictor variable	df	R ²	F	β	t
Math (fall)	SAT	2, 165	.12	11.85***	0.35	3.78***
	Autonomy Model				0.28	2.16*
Math (spring)	SAT	2, 165	.22	22.96***	0.42	4.89***
	Autonomy Model				0.42	3.48***
Math (repeated measures)	SAT			22.57***		
	Autonomy Model					9.48**
Reading (fall)	SAT	2, 166	.20	20.56***	0.52	5.48***
	Autonomy Model				0.27	2.03*
Reading (spring)	SAT	2, 166	.15	15.09***	0.44	4.80***
	Autonomy Model				0.19	1.53
Reading (repeated measures)	SAT			31.26***		
	Autonomy Model					3.76*
Language arts (fall)	SAT	2, 165	.28	32.10***	0.39	4.36***
	Autonomy Model				0.68	5.54***
Language arts (spring)	SAT	2, 165	.19	18.87***	0.36	3.90***
	Autonomy Model				0.47	3.73***
Language arts (repeated measures)	SAT			20.35***		
	Autonomy Model					25.51***
Spelling (fall)	SAT	2, 156	.09	7.82***	0.23	2.57*
	Autonomy Model				0.30	2.31*
Spelling (spring)	SAT	2, 156	.08	7.04**	0.11	1.37
	Autonomy Model				0.35	3.07**
Spelling (repeated measures)	SAT			4.48*		
	Autonomy Model					7.82**
Social studies (fall)	SAT	2, 159	.14	12.90***	0.27	2.82**
	Autonomy Model				0.46	3.52***
Social studies (spring)	SAT	2, 159	.18	17.28***	0.30	3.14**
	Autonomy Model				0.54	4.17***
Social studies (repeated measures)	SAT			10.74***		
	Autonomy Model					17.87***

* $p < .05$. ** $p < .01$. *** $p < .001$.

References

- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*, 49-74.
- Ames, C. (1984). Achievement attributions and self-instructions under competitive and individualistic goal structures. *Journal of Educational Psychology, 76*, 478-487.
- Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261-271.
- Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivational processes. *Journal of Educational Psychology, 80*, 260-267.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 71*, 191-215.
- Blumenfeld, P. C. (1992). Classroom learning and motivation: Clarifying and expanding goal theory. *Journal of Educational Psychology, 84*, 272-281.
- Brophy, J. (1983). Fostering student learning and motivation in the elementary school classroom. In S. Paris, G. Olson, & H. Stevenson (Eds.), *Learning and motivation in the classroom* (pp. 283-305). Hillsdale, NJ: Erlbaum.
- Connell, J. P. (1985). A new multidimensional measure of children's perceptions of control. *Child Development, 56*, 1018-1041.
- Connell, J. P. (1991). Context, self and action: A motivational analysis of self-system processes across the life-span. In D. Cicchetti (Ed.), *The self in transition: Infancy to childhood* (pp. 61-97). Chicago: University of Chicago Press.
- Connell, J. P., & Ryan, R. M. (1987). *Self-Regulatory Style Questionnaire: A measure of external, introjected, identified, and intrinsic reasons for initiating behavior* [Manual]. Rochester, NY: University of Rochester.
- Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy and relatedness: A motivational analysis of self-system processes. In M. Gunnar & L. A. Sroufe (Eds.), *Minnesota Symposium of Child Psychology* (Vol. 22, pp. 43-77). Minneapolis: University of Minnesota Press.

- de Charms, R. (1968). *Personal causation: The internal affective determinants of behavior*. San Diego, CA: Academic Press.
- Deci, E. L., Bentley, G., Kahle, J., Abrams, L., & Porac, J. (1981). When trying to win: Competition and intrinsic motivation. *Personality and Social Psychology Bulletin*, 7, 79–83.
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, 62, 119–142.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Eds.), *Nebraska Symposium on Motivation: Vol. 38: Perspectives on motivation*. Lincoln: University of Nebraska Press.
- Dweck, C. S. (1975). The role of expectations and attributions in the alleviation of learned helplessness. *Journal of Personality and Social Psychology*, 31, 647–685.
- Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist*, 41, 1040–1048.
- Dweck, C. S., & Elliot, E. S. (1983). Achievement motivation. In E. M. Hetherington (Ed.), *Handbook of child psychology: Vol. 4. Socialization, personality, and social development* (pp. 643–691). New York: Wiley.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256–273.
- Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development*, 1, 661–669.
- Koestner, R., Ryan, R. M., Bernieri, F., & Holt, K. (1984). Setting limits on children's behavior: The differential effects of controlling vs. informational styles on intrinsic motivation and creativity. *Journal of Personality*, 52, 233–248.
- Kolligian, J. (1990). Perceived fraudulence as a dimension of perceived competence. In R. J. Sternberg & J. Kolligian (Eds.), *Competence considered* (pp. 261–285). New Haven, CT: Yale University Press.
- Marshall, H. H., & Weinstein, R. S. (1986). Classroom context of student-perceived differential teacher treatment. *Journal of Educational Psychology*, 78, 441–453.
- Meece, J. L. (1991). The classroom context and students' motivational goals. In M. Maehr & P. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 7, pp. 261–285). Greenwich, CT: JAI Press.
- Meece, J. L., Blumenfeld, P. C., & Hoyle, R. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology*, 80, 514–523.
- Nicholls, J. G. (1984). Achievement motivation: Conceptualization of ability, subjective experience, task choice, and performance. *Psychological Review*, 91, 328–346.
- Patrick, B. C., Skinner, E. A., & Connell, J. P. (1993). What motivates children's behavior and emotion? Joint effects of perceived control and autonomy in the academic domain. *Journal of Personality and Social Psychology*, 65, 781–791.
- Peterson, C., & Seligman, M. E. P. (1984). Causal explanations as a risk factor for depression: Theory and evidence. *Psychological Review*, 91, 347–374.
- Phillips, D. A. (1984). The illusion of incompetence among academically competent children. *Child Development*, 55, 2000–2016.
- Phillips, D. A. (1987). Socialization of perceived academic competence among highly competent children. *Child Development*, 58, 1308–1320.
- Phillips, D. A., & Zimmerman, M. (1990). The developmental course of perceived competence and incompetence among competent children. In R. J. Sternberg & J. Kolligian, Jr. (Eds.), *Competence considered* (pp. 41–66). New Haven, CT: Yale University Press.
- Pittman, T. S., Davey, M. E., Alafat, K. A., Wetherill, K. V., & Kramer, N. A. (1980). Information versus controlling verbal rewards. *Personality and Social Psychology Bulletin*, 6, 228–233.
- Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43, 450–461.
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57, 749–761.
- Seligman, M. E. P. (1975). *Helplessness: On depression, development and death*. New York: Freeman.
- Seligman, M. E. P., & Maier, S. F. (1967). Failure to escape traumatic shock. *Journal of Experimental Psychology*, 74, 1–9.
- Skinner, E. S. (1991). Development and perceived control: A dynamic model of action in context. In M. Gunnar & L. A. Sroufe (Eds.), *Minnesota Symposium of Child Psychology* (Vol. 22, pp. 167–216). Minneapolis: University of Minnesota Press.
- Skinner, E. S., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, 85, 571–581.
- Skinner, E. S., Chapman, M., & Baltes, P. B. (1988). Beliefs about control, means-end, and agency: A new conceptualization and its measurement during childhood. *Journal of Personality and Social Psychology*, 54, 117–133.
- Skinner, E. S., & Wellborn, J. G. (1994). Coping during childhood and adolescence: A motivational perspective. In D. L. Featherman, R. M. Lerner, & M. Perlmutter (Eds.), *Life-span development and behavior* (Vol. 12, pp. 91–133). Hillsdale, NJ: Erlbaum.
- Skinner, E. S., Wellborn, J. G., & Connell, J. P. (1990). What it takes to do well in school and whether I've got it: The role of perceived control in children's engagement and school achievement. *Journal of Educational Psychology*, 82, 22–32.
- Weiner, B. (1986). *An attributional theory of motivation and emotion*. New York: Springer-Verlag.
- Weinstein, R. S., Marshall, H. H., Brattesani, K. A., & Middlestadt, S. E. (1982). Student perceptions of differential teacher treatment in open and traditional classrooms. *Journal of Educational Psychology*, 74, 678–692.
- Wellborn, J. G. (1991). *Engagement versus disaffection: Motivated patterns of action in the academic domain*. Unpublished doctoral dissertation, University of Rochester, Rochester, NY.
- Wellborn, J. G., Connell, J. P., & Skinner, E. S. (1989). *Student perceptions of control questionnaire: A new measure of perceptions of control in children* (Tech. Rep. No. 102). Rochester, NY: University of Rochester.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297–333.

Appendix A

Factor Loadings for Perceived Behavioral Engagement Items

Factor	1	2	3	4	5	6	7
1. Involved							
I listen carefully in class	.66						
I try very hard in school	.61						
The first time my teacher talks about a new topic I listen very carefully	.60						
I work hard when we start something new in class	.59						
I pay attention in class	.54						
When I have a hard question or problem in class, I don't even try	-.42						
When I'm in class, I just act like I'm working	-.51						
2. Persisting							
If a problem is really hard, I keep working at it		.68					
If I can't get a problem right the first time I just keep trying		.67					
If I can't think of the answer to a question, after a minute it comes to me		.66					
I really concentrate when my teacher presents new material		.60					
When I have trouble with a problem, I usually get it right in the end		.49					
When I get stuck on a question, I can usually get it		.38					
I pay attention when we start a new subject		.37					
3. Avoiding							
If I run into a difficult question, I'll probably get it wrong			.75				
If a problem is really hard, I'll probably miss it			.68				
When I have a hard problem on a test, I skip it			.58				
When I have a hard problem on a test, I won't figure out the answer			.51				
When we begin a new topic, I have trouble concentrating			.48				
If a problem is really hard, I just quit working on it			.39				
4. Ignoring							
When we start something new, I practically fall asleep				.79			
When I'm in class, I usually think about other things				.76			
My mind wanders when my teacher starts a new topic				.66			
I never seem to pay attention when we start a new subject				.34			
5. Helpless							
When I come to a problem that I can't solve right away, I just give up					.74		
When I can't solve a problem right away, I won't figure it out					.66		
When I have a hard question or problem in class, I just don't quit					-.45		
6. Participating							
I participate when we discuss new material						.70	
I participate in class discussions						.64	
7. Concentrating							
When I come to a problem I can't solve right away, I usually figure it out in the end							.72
When I'm in class, time goes by really slowly							.62
When I run into a difficult question, I try even harder							.45

(Appendix B follows on next page)

Appendix B

Factor Loadings for Perceived Emotional Engagement Items

Factor	1	2	3	4	5
1. Curiosity					
When I'm doing my work in class, I feel interested	.83				
When I'm working on my classwork, I feel relaxed	.66				
When I'm doing my work in class, I feel comfortable	.63				
When my teacher first explains new material, I feel relaxed	.62				
When I'm in class, I feel good	.57				
When my teacher first explains new material, I feel great	.44				
2. Anxiety					
When my teacher first explains new material, I feel scared		.77			
When I'm in class, I feel unhappy		.69			
When I'm in class, I feel sad		.68			
3. Anger					
When I can't solve a question or problem in class, I feel worried			.82		
When I can't solve a question or problem in class, I feel mad			.79		
When I can't solve a question or problem in class, I feel angry			.78		
When I can't solve a question or problem in class, I feel anxious			.57		
4. Enjoyment					
When I'm in school, I feel happy				.78	
When I'm in school, I feel fine				.65	
When we start something new, I feel interested				.49	
When I'm in school, I feel bad				-.56	
When I'm in school, I feel terrible				-.56	
5. Boredom					
When I'm doing my work in class, I feel bored					.83
When my teacher first explains new material, I feel bored					.63
When I'm working on my classwork, I feel sleepy					.60
When we start something new in school, I feel tired					.52
When I'm working on my classwork, I feel involved					-.44

Note. Because factor analysis sorts items according to the pattern of participants' responses, an item may load differently from what was expected. This is especially problematic with the responses of children. Rather than eliminating or shifting items, I took the conservative approach of using the factors as mathematically identified.

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