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KEYWORD - MOTIVATION

What goals make good grades – and why?

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Reference:

Kuhl, J., Baumann, N., & Kazén, M. (2007). What goals make good grades – and why? *Academic Exchange Quarterly: Self-Regulation of Learning, 11 (4),* 192-196.

Abstract
In two school settings differing in cultural background (northern vs. southern Germany) and age level (7th vs. 11th grade) the impact on performance (GPA) of four motivational orientations (i. e., orientations toward competition, diagnosticity, high task difficulty and self-integration) and of a general intelligence factor is evaluated. Results show a reliable main effect for self-integration. Additional results revealed diligent and independent behavior as mediators of the facilitating effects and self-motivation as a precursor of integrated orientation. Teachers_ assessment of giftedness is significantly affected by integrated orientation.

Introduction
The study of achievement motivation has a complex history (Elliot, 2005). Global (projective) measures of the emotional (preverbal) basis of achievement motivation predict spontaneous achievement-related behavior and cumulative achievement (McClelland, Koestner & Weingarten, 1989), but fail to predict performance where it is explicitly expected, for example in the classroom (Entwisle, 1972). In recent years, a vast amount of research has revealed the motivational significance of competence-related goals (Elliot & Dweck, 2005). Specifically, better performance is associated with approach rather than avoidance goals and with learning goals that focus on internal rather than social standards of comparison (Elliot & McGregor, 2001). This 2 x 2 framework of competence-related goals is not meant to be an exhaustive account of possible goals. In the present article, we report findings from two studies that investigated three additional approach goals. These goals derive their motivational power from different sources, task difficulty (Atkinson, 1957), diagnosticity or uncertainty (Trope & Brickmann, 1975; Sorrentino, 1996), and integrative (achievement-related) competence, respectively. The latter type of motivation derives from the concept of self as a high-level implicit system that integrates all personally relevant autobiographical episodes into a coherent framework (Koole & Kuhl, 2003; Rothermund & Meiniger, 2004; Sheldon & Kasser, 1995). In the present context the integrative competence of self is operationalized by a scale tapping the integration of achievement-related self-confidence and personal value of achievement. As a fourth type of approach goal competitive goal orientation is taken into account which overlaps with performance goals in Elliot and McGregor's scheme.

Our study is focused on three questions: First, how do the four goal orientations compare regarding their relevance for scholastic performance (grade point average)? Since this first question is the basis for the remaining ones, we examined the reliability and generalizability of the four goal orientations considered as predictors of grade point average (GPA) in two samples taken from different German schools. The remaining hypotheses were investigated in the second (larger) sample of students. The second question is especially relevant for intervention purposes: What are the antecedents and mediators of whatever may turn out to be the best predictor of school performance included in the study? We hypothesized integrative self-competence to be the best predictor of scholastic performance among the four goal orientations considered because it entails the integration of cognitive and motivational skills necessary to translate motivation into performance. Based on research on affect regulation (Kuhl & Beckmann, 1994; Koole & Jostmann, 2004) we further hypothesized self-motivation (i.e., the ability to generate motivational energy when confronted with challenging tasks) to be a significant antecedent of integrative competence. In addition, we expected that engagement in task-focused behavior ("diligence") would be a mediator of integrative competence. Finally, the third question examined was: To what extent do teachers' ratings of giftedness reflect the relative contribution of each goal orientation on performance? We did not have a clear-cut prediction of whether teachers would be able to base their judgments of giftedness on whatever would turn out to be the strongest predictor of performance or whether their

ratings would merely reflect their students' GPA. It goes without saying that the answer to this third question has some relevance for the weight one should assign to teachers' ratings of giftedness (among other criteria) for the assessment of special abilities.

Method

Participants

The first sample (N = 38; 17 males and 19 females) was taken from a high school ("Gymnasium") of a mid-size town in northern Germany (Lower Saxony) whereas the second sample (N = 66: 38 males and 28 females) was taken from a high school ("Gymnasium") from a small town in southern Germany (Baden-Württemberg). The age range was 11 to 14 (7th grade) in the first sample and 16 to 18 (11th grade) in the second sample.

Materials

The four goal orientations were assessed by subscales of the motivational enactment inventory (Kuhl & Henseler, 2004) which also contains scales related to affiliation and power motivation. Sample items and reliabilities are: "I find very difficult tasks most appealing" (*difficulty orientation:* α = .70), "I often choose to engage in activities in which I can test my skills" (*diagnosticity orientation:* α = .82), "Achievement means being better than others" (*competitive orientation:* α = .78), and "When I failed at a task I can find the correct solution without any help" and "Good grades are important to me" (*integrated achievement:* α = .74).

General intelligence was assessed by Raven's standard progressive matrices (SPM; Raven, Court, & Raven, 1996). Additional variables were assessed by teachers' ratings of student behaviors or competencies (e.g. diligent, gifted, independent at work, analytical thinking, concentrated, ambitious, curious, eager, obnoxious, shy) on 5-point Likert scales.

Two affect-regulatory abilities were assessed in study 2 by subscales from a short version of the volitional components inventory (Kuhl & Fuhrmann, 1998). Sample items are: "When confronted with an unpleasant activity I can make myself more and more aware of its nice sides" (*self-motivation*: α = .82) and "When I feel upset I know how to relax" (*self-relaxation:* α = .84).

Results

Motivation and intelligence: Predictors of scholastic performance

To examine the independent effect of general intelligence (SPM) and each of the four motivational predictors on performance, these five variables were entered into a multiple regression model using grade point average as a criterion. This GPA was based on the three major subjects (math, German language and English). GPA scores range from 1 to 6, according to the German system, with lower scores indicating better performance. To ensure that high scores mean high performance GPA scores were inverted. As can be seen from Table 1, intelligence and integrated achievement had reliable effects on performance in either study whereas the remaining three motivational orientations did not have any reliable effects (in sample two, competitive motivation even tended to be negatively related to performance).

Table 1: Results from regression analyses conducted within two samples examining the relevance of four motivational orientations and general intelligence for the prediction of scholastic performance (grade point average)

Predictors	Beta (sample 1: $N = 38$; $R = .44$**)	Beta (sample 2: $N = 66$; $R = .51$**)
Intelligence	.47**	.21*
Difficulty Orientation	-.001	-.09
Diagnosticity Orientation	.001	.10
Integrated Achievement	.42**	.61**
Competitive Orientation	.21	$-.18^{+}$

Note: $^{+}p < .10$; $^{*}p < .05$; $^{**}p < .01$

Antecedents and mediators of integrated achievement

To examine potential mediators of the relationship between integrated motivation and performance we examined teachers' ratings of several behavioral criteria. Only three behavioral criteria showed significant relationships with either variable (i.e., integrated motivation and performance): Independent, diligent and analytical behavior. Results from mediation analyses (Baron & Kenny, 1986) are listed in Table 2. It can be seen that in either sample integrated achievement increased performance through promoting diligent behavior which in turn facilitated performance. Statistically controlling for diligence (i.e., the hypothetical mediator M) resulted in a significant decrease of the motivation-performance relationship (see column "P-C *with* M" in Table 2) as indicated by the significant Sobel-Test (which examines the significance of the reduction of the predictor-criterion relationship after introducing the mediator into the regression equation). Additional analyses for teachers' ratings of their students' "independent working style" and "analytical thinking style" revealed similar mediation effects: The relationship between integrated achievement and performance is also mediated by independence and analytical thinking.

Table 2: Regression coefficients (Standardized Beta) from two mediation analyses examining the mediating role of teachers' ratings of "diligence" (mediator: M) for the relationship between integrated achievement orientation (predictor: P) and performance (criterion: C).

	P-M	M-C	P-C without M	P-C with M	Sobel (*Z*)
Study 1 (N = 38)	.41*	.59**	.44*	.20	-2.26*
Study 2 (N = 66)	.45***	.38***	.67***	.49***	-2.80**

Note: $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$

Since affect-regulation scales (self-motivation and self-relaxation) were included in study 2, we examined whether self-motivation or self-relaxation can be considered antecedents of

integrated achievement orientation: Two additional mediation analyses were conducted using self-motivation or self-relaxation as predictors and integrated achievement as a mediator (performance was kept as the criterion as in the previous analyses). Results from the only significant mediation model are shown in Figure 1. It can be seen that self-motivation (i.e., the ability to enhance one's motivation when confronted with difficult or unpleasant tasks) is a strong antecedent of performance and integrated motivation. The Sobel-Test for this mediation effect was highly significant (Z = -3.89, p < .0001, two-tailed). A similar analysis of self-relaxation did not replicate these findings.

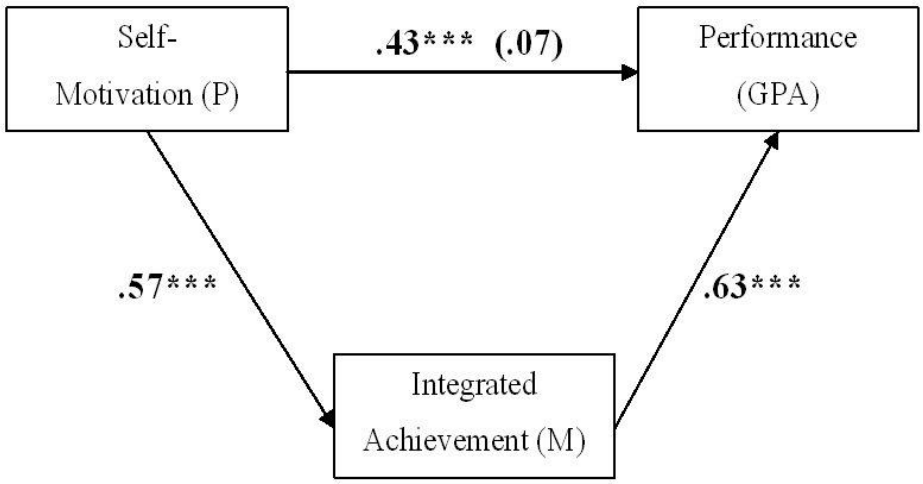

Figure 1: Regression coefficients (Standardized Beta) from a mediation analyses demonstrating that self-motivation can be regarded as an antecedent (predictor: P) of integrated achievement orientation which in turn mediates (M) the effects of affect regulation on performance (grade point average: GPA). Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Teachers' assessment of giftedness

As a final step in data analysis we examined the extent to which teachers' ratings of giftedness (which was obtained in study 2 only) are based on grades only or whether giftedness ratings are also based on the psychological determinants of good performance. As expected the correlation between giftedness ratings and scholastic performance (GPA) was very high (r = .76, p < .001). We computed a regression model using teachers' giftedness ratings as a criterion and intelligence and the four motivational variables as predictors. The only significant predictor of giftedness ratings was the motivational variable that had turned out to be the crucial predictor of performance in the previous analyses. Specifically, the regression weight (Beta) for integrated achievement was .47 (p < .01). All other motivational variables did not even come close to significance. This finding suggests that teachers' ratings of giftedness are based on more than the grades students receive from them: Giftedness ratings also take into account the motivational orientation that our analysis revealed to be the most relevant factor predicting performance (GPA) among the motivational antecedents examined in our two studies. However, teachers do not seem to take into account general intelligence in their giftedness ratings which did make an independent contribution to performance.

Discussion

The results reveal a clear-cut "winner" among the motivational variables we included as predictors of scholastic performance: Integrated achievement orientation had a strong effect on GPA whereas motivational orientations based upon competition, diagnosticity, or (high) difficulty failed to affect performance. From a theoretical point of view, the self is regarded as the basis of integrative orientation. According to several approaches describing the phenomenological (Deci & Ryan, 2000) and functional characteristics of self (Koole & Kuhl, 2003; Kuhl, 2000), the crucial feature of the self system is its integrative competence: It integrates positive and negative experience (Showers & Kling, 1996) into a coherent framework (Sheldon & Kasser, 1995). According to the theoretical framework guiding our research (Kuhl, 2000), the self is an extended cognitive-emotional network ("extension memory") based on parallel-distributed processing of numerous autobiographical episodes. Its potential to help translate motivation into performance can be derived from its integrating both cognitive skills and motivational power. Its cognitive capacity is based on its extendedness (which in turn implies that most of its work is done without conscious awareness): When faced with failure people who have developed an extended self-system and have access to it can virtually always think of another option for action (which is one type of questions used to assess integrative motivation).

The second, motivational, component of the self-system is related to its affect-regulating capacity: According to the theory of personality systems interactions (PSI theory: Kuhl, 2000), affect regulation is crucial for self-access: Excessive negative affects impairs self-access and self-access in turn facilitates affect regulation (i.e., self-motivation and self-relaxation). Because of its self-motivational capacity, the self presumably enhances motivation wherever it is needed (e.g., when confronted with challenging or unpleasant tasks). This affect-regulatory capacity of the self has been demonstrated in laboratory experiments, both with regard to self-motivation (Koole & Jostmann, 2004) and self-relaxation (Rothermund & Meiniger, 2004). People who have developed good self-motivational skills should be able to develop positive evaluations and personal importance of the personal goals they strive for and the outcomes obtained. Accordingly, our scale assessing integrated achievement orientation contains items tapping this positive valuing process that has been emphasized as a crucial determinant of self (Deci & Ryan, 2000; Rogers, 1960). Our finding revealing self-motivation as an antecedent of integrated achievement orientation is consistent with the theoretically postulated link between a well developed self-system and both self-motivational skills and an orientation towards achievement goals that integrates extended cognitive knowledge networks (resulting in self-confidence) and enhanced valuing of personal goals (supporting task motivation).

It should be noted that our findings to not discount other motivational orientations examined here or elsewhere (e.g., Elliot & McGregor, 2001): They should be important components of the motivation process, especially when the appropriate constraints or incentives are present. For example, competitive achievement motivation should be important whenever social comparison is salient (e.g., with top performance). Diagnosticity and uncertainty reduction (i.e., the thrill of just testing one's skills at moderately difficult tasks) may be especially relevant when intrinsic competence motivation is aroused in autonomy-supporting rather than controlling contexts (which are not particularly representative of school settings, at least not in Germany). Focusing on high and very high difficulty levels may entail the risk of overmotivation and discouragement, but it may be a good basis for perseverance and tenacity when combined with special skills, especially in very demanding settings.

Our finding that the integrated orientation is the only one that produces *main effects* on performance under the conditions encountered in the school settings examined can be attributed to the fact that this motivational orientation integrates both the motivational and the cognitive skills necessary to directly translate motivation into performance. The fact that this motivation-performance relationship extends across our two samples, which differ in age, cultural context (between northern and southern Germany), and several other features, suggests that the impact of integrated motivation on performance may generalize across several context factors.

Conclusion

It may be concluded that integrated motivation should be a central target for counseling and training. In the two schools involved in our research, we are currently conducting individual counseling and training courses (Martens & Kuhl, 2004) that focus on the development of self-motivation. Preliminary results show significant improvements, not only in the target variable (i.e., self-motivation), but also in scholastic performance.

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