



Reciprocal relationships between value orientation and motivational interference during studying and leisure

Manfred Hofer^{1*}, Sebastian Schmid², Stefan Fries², Britta Kilian¹
 and Claudia Kuhnle¹

¹University of Mannheim, Germany

²University of Bielefeld, Germany

Background. Motivational interference is defined as the amount of impairment in a target activity due to the incentives of a non-chosen attractive alternative. The amount to which pupils experience motivational interference while studying or while performing a leisure activity in a school–leisure conflict situation is seen as depending on the values they attach to achievement and well-being. At the same time, values may also be effects of frequent experience of motivational interference in the respective areas.

Aims. The study is aimed at investigating the reciprocal relationship between personal value orientations and the experience of motivational interference during studying and leisure.

Sample. A total of 363 pupils (sixth to eighth graders at the time of first measurement) completed the same questionnaire twice in a 2-year interval.

Method. The questionnaire included measures of achievement and well-being value orientation and the experience of motivational interference during studying and during leisure in school–leisure conflicts. For this, two scenarios were created. In regression analyses, achievement and well-being value orientations as well as their interaction terms were used as predictors for experience of motivational interference at t_2 while controlling for experience of motivational interference at t_1 , and vice versa. Additionally in path models, these relations were tested in an integrative way.

Results. Pupils' achievement value orientations were connected to differential changes in experiencing motivational interference during leisure and during studying in one scenario but only for pupils low or medium in well-being value orientation. Conversely, experience of motivational interference at t_1 was related to changes in value orientations 2 years later. High motivational interference during studying led to an increase in well-being value orientation, while high motivational interference during leisure was followed by a decrease in well-being value orientation and an increase in achievement value orientation. Overall, path models supported these results.

*Correspondence should be addressed to Professor Dr Manfred Hofer, University of Mannheim, Mannheim, Germany (e-mail: manfred.hofer@sowi.uni-mannheim.de).

Conclusions. The results are discussed in terms of value change and are linked to self-control and motivation research.

Conceptual framework

In the realm of education, it is increasingly recognized that cultural and societal factors play a crucial role in academic learning. For instance, Boekaerts (2003) argues that the cultural context in which adolescents grow up influences their goals as well as the regulation of their school- and leisure-related behaviour. Central features of the cultural context are the values adopted and developed during the socialization process. Despite the plausibility of this argument, cultural values and personal value orientations are rarely taken into account in analyses of learning behaviour, academic motivation, and development (Boekaerts, de Koning, & Vedder, 2006; Greenfield, Keller, Fuligni, & Maynard, 2003). In one of the few studies, Feather (1988) showed a relation of values and academic choices in a sample of university students. Hofer *et al.* (2007) found pupils' individual value orientations to be related to experience of motivational interference in school-leisure conflicts and to time invested in schoolwork. These studies provide evidence for the connection between value orientations and learning.

As these studies used cross-sectional designs they do not allow drawing conclusions on the extent to which values influence motivational variables. The results could also mean that values are not causes but consequences of foregoing motivational processes. In the current paper, a longitudinal study with adolescents is presented in which reciprocal influences of personal value orientations and motivational interference following school-leisure conflicts were analysed. More specifically, achievement and well-being value orientations on the one hand and the experience of motivational interference during studying and during leisure in a school-leisure conflict on the other were assessed twice within a 2-year period. Both sets of variables served as predictors as well as criteria. The relations between them were investigated using multiple regression and path analyses.

Experience of motivational interference

The construct of motivational interference has been introduced to study effects of school-leisure conflict. Motivational interference is defined as the cognitive, affective, and behavioural impairment of a chosen activity as a result of the motivational properties of a non-chosen alternative (cf. Fries, Dietz, & Schmid, 2008). It displays itself in phenomena such as reduced persistence, switching activities, superficial learning, and bad mood (Fries & Dietz, 2007). If pupils engage in study behaviour, the expected consequences not only of the action actually performed but also those of dismissed leisure activities influence their actual motivation. Thinking about alternative options is expected to impair learning. In a cross-sectional study, Fries *et al.* (2008) found that motivational interference increased the more attractive a non-chosen task was to the learner. Furthermore, there is experimental evidence for the influence of dismissed options on the quality of current behaviour. In a study by Fries and Dietz (2007), the primary activity was a learning task while the distracting alternative was a music video rating task. When this alternative option was present during pupils' studying, experience, and performance of learning suffered and learning results were impaired. School-leisure conflict is not only detrimental for learning though - it also can have negative effects on free time experience. Pupils who highly value achievement tend to

enjoy meeting friends less when a learning commitment is left pending than pupils to whom achievement is not of high value (Fries, Schmid, Dietz, & Hofer, 2005; Hofer, Schmid, & Zivkovic, 2008).

The notion of school-leisure conflict leading to motivational interference can be reconstructed as a self-control dilemma denoting an internal conflict between the pursuit of behavioural plans that differ in their long-term importance. It takes up the idea of costs as a category of task value in the expectancy-value theory (Wigfield & Eccles, 2000). Wigfield and Eccles (2000, p. 72) define costs as 'how the decision to engage in one activity (e.g., doing schoolwork) limits access to other activities (e.g., calling friends)'. Choices are influenced by positive and negative task valences, which both are characterized by immediate as well as long-range consequences (Eccles, 2005). In school-leisure conflicts, self-control is needed because the pupil weighs an immediate goal of high present attraction (spending time with friends) against a goal that usually is less attractive but important for the future (studying for the next exam) (Bembenutty & Karabenick, 2004; Husman & Lens, 1999; Wolters, 2003).

Delay of gratification as the tendency to renounce an immediately available opportunity in favour of one that is temporarily remote but apparently more valuable (e.g., Green & Myerson, 2004; Kirby, 1997; Metcalfe & Mischel, 1999; Rachlin, Brown, & Cross, 2000) has similarities to the situation of a school-leisure conflict. A school-leisure conflict can lead to academic procrastination that is defined as the voluntary postponement of an intended course of action despite expecting to have disadvantages because of the delay (Steel, 2007).

In sum, several research lines deal with situations in which more than one motivation is active and different motivations compete against each other. It seems safe to say that a failure in self-control is a common feature that also is inherent in the situation of a school-leisure conflict and results in the experience of motivational interference.

On the other hand, school-leisure conflicts differ from most self-control dilemmas with regard to the desirability of the short-term goal. Some behaviour of pupils that compete with learning can be labelled as undesirable. For instance, excessive computer playing or watching TV is regarded as negative. A pupil, however, should resist temptations only sometimes. In many cases, the task is to reduce or to postpone impulses rivalling with schoolwork rather than suppressing them. From a life satisfaction perspective, the ideal is to find a balance between pursuing immediately available sources of pleasure whilst also striving for long-term goals. The task of self-control is to find an optimal balance between present and future rewards and between school and leisure to reduce motivational interference.

Value orientation and the experience of motivational interference

We propose that persons are differentially susceptible to motivational interference depending on their value orientations. Schwartz (e.g., 1992) defined values as desirable, trans-situational goals of varying importance that serve as guiding principles in people's lives. A more general definition states that values are generalized beliefs about the desirability of behaviours and events (Fries, Schmid, & Hofer, 2007). The value orientation concept can be linked to motivation theory. It resembles the concept of task value, valence, or valuing, used in integrative theories of motivation, such as the Expectancy-Value Theory (Wigfield & Eccles, 2000) or the Motivation and Engagement Wheel (Martin, 2007) insofar as also these concepts state that the importance individuals attach to tasks, goals, and principles triggers motivation. However, the term

value in this paper is used in a different meaning. While a subjective task value is seen as a person's appraisal of a specific task (Eccles, 2005), individual values are not explicitly linked to specific behaviours, goals, objects, or tasks. Instead, they allow people to decide what to prefer and what to avoid, because goals, behaviours, and tasks can be judged on the basis of their match or mismatch to an individual's value system (Fries *et al.*, 2007). Feather (1990) argues that values have an indirect impact on behaviour through their influence on the valences underlying behavioural decisions. As the setting of priorities between different values is inherent in the value construct (Schwartz, 2006), it invites investigating goal conflicts that influence learning motivation. Values come into play when a person experiences a conflict between two equally important options that are central to the person's self (Verplanken & Holland, 2002). We propose that pupils' value orientations influence the degree to which they experience motivational interference in school-leisure conflicts.

Comparing different value conceptions in the literature (Boekaerts *et al.*, 2006; Hofstede & Hofstede, 2005; Inglehart, 1997; Schwartz *et al.*, 2001), we find the distinction between an achievement and a well-being value orientation to be especially relevant for school-leisure conflicts. These concepts are based on Inglehart's (1997) distinction between two orthogonal value dimensions; modern values on the one hand and post-modern values on the other (see also Inglehart & Welzel, 2005). Modern values include achievement, determination, thrift, and responsibility. Corresponding to this conception, 'achievement value orientation' describes the importance of effort and success to pupils. Persons with high values on Inglehart's post-modern dimension judge free choice, friends, satisfaction, and leisure as important. The dimension of 'well-being value orientation' characterizes pupils' varying preference for leisure time and friends. In questionnaire studies (Fries *et al.*, 2005; Hofer *et al.*, 2007), these two dimensions were related to motivational interference during studying as well as during leisure. Pupils emphasizing well-being value orientations indicated experiencing less motivational interference in leisure activities after school-leisure conflicts but more interference during studying than pupils with low well-being value orientation. The opposite pattern was found for pupils with high achievement value orientation. These findings proved to hold in samples from countries being as different as Germany, Italy, Spain, Croatia, USA, and India (Hofer, Schmid, Fries, Zivkovic, & Dietz, 2009; Hofer *et al.*, 2008). Given the cross-sectional character of the studies it remains unclear whether pupils' reactions in school-leisure conflicts really depend on their value orientations. On the one hand, there is evidence for the influence of value orientations on behaviour. On the other hand, value orientations can be seen as changeable over time. Changes in value orientations may be a result of experiencing the regulation of one's own behaviour, such as facing motivational interference in school-leisure conflict. In the following, a closer look is taken at each of these two possibilities.

Reciprocal influences of value orientation and behaviour

Evidence on causal influences of value orientation on behaviour mainly comes from experimental studies applying the priming paradigm. For instance, Gardner, Gabriel, and Lee (1999) primed individualist versus collectivist values and demonstrated an effect on the evaluation of helping behaviour in a social judgment task. Priming altruistic values resulted in donating behaviour (Verplanken & Holland, 2002). Similarly, Smeesters, Warlop, and Van Avermaet (2003) primed morality and might concepts. This led subjects to behave accordingly in a social dilemma task. In summary, values may give

meaning to, energize, and regulate value-congruent behaviour, if they are cognitively activated and central to the self (Verplanken & Holland, 2002). This line of thinking is akin to the notion that the valuing of a task contributes to pupils' motivation and engagement (e.g., Martin, 2007; Wigfield & Eccles, 2000), but value orientations are broader determinants than task incentives.

The reverse direction is also conceivable. A pupil experiencing a category of actions continually as rewarding may increase its value. It has been argued, for instance, that individual interests emerge if activities are experienced as enjoying while a situational interest that provides more frustration than pleasure will not be further pursued (Hofer, 2010). There is also evidence that repeated positive experiences during learning in a given subject can enhance achievement in this field (e.g., Pekrun, Goetz, Titz, & Perry, 2002) which might raise the value attached to the field. With regard to individual values, the priorities of values can be changed by self-confrontation (Rokeach, 1973). This method confronts people after having ranked their own values with information about the value priorities that discriminate between a positive and a negative reference group. Learning that there is a contradiction between one's value priorities and one's self-concept gives rise to self-dissatisfaction about contradictions within one's value self-concept system. In order to reduce this self-dissatisfaction, individuals change their value priorities to achieve better consistency of values and their self-concepts. In summing up, there is evidence that value orientations can be seen also as dependent variables.

Hence in our study, we used a longitudinal design to test these contentions. Here, the intervention is natural and operates continuously over time. Pupils experience their habitual degrees of motivational interference during studying and leisure. If they perceive discrepancies to their goals and values, they might change them to close the gap between goals and feedback. To our knowledge, longitudinal studies have not been conducted so far to investigate the question of determinants of value change. We expect that value orientations and experience of motivational interference influence each other reciprocally.

The aim of the study

In the present study, the relations between value orientations and experiences of motivational interference during studying and leisure in a motivational conflict are analysed longitudinally. First, we assume that achievement and well-being value orientations determine successive experience of motivational interference: achievement value orientation should be negatively related to a subsequent change in the experience of motivational interference during studying and positively to a change in the experience of motivational interference during leisure 2 years later, while well-being value orientation should result in the opposite pattern. To determine the joint influence of value orientations on experiences of motivational interference, an interaction term was entered into the regression equations and the path model as a predictor. Pupils valuing one dimension high might react differently depending on whether they score low or high on the other value dimension. Second, we assume an influence of motivational interference on value orientations. The experience of motivational interference during studying should result in a lower subsequent achievement value orientation and a higher well-being value orientation, while the experience of motivational interference during free time should weaken well-being and strengthen achievement value orientations. Also here, an interaction term was entered in order to test whether the impact that the experiences in one life domain have on value

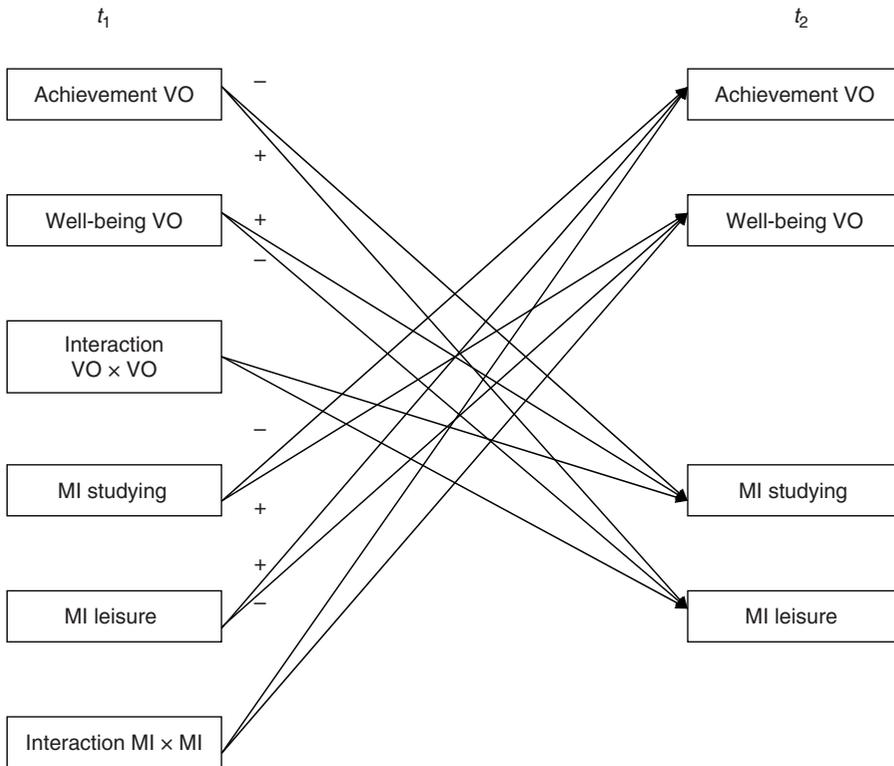


Figure 1. Hypothesized relations. VO, value orientation; MI, experience of motivational interference.

orientations depends on the experiences in another life domain. All hypothesized relations are summarized in Figure 1.

Adolescent pupils value orientations and experiences of motivational interference were measured twice with a 2-year interval between measurements. The use of a sample of early to mid adolescents seems appropriate to study the relationships between value orientation and experience because in this age period persons are actively developing their values (Bubeck & Bilsky, 2004). As people do not markedly change values as a result of everyday experience (e.g., Sheldon, 2005) unless single events of high importance occur such as serious illness, relegation from school, or dramatic media events (Verkasalo, Goodwin, & Bezmenova, 2006) a more substantial 2-year interval was chosen.

Method

Participants

The questionnaires were answered in nine schools of a middle sized German city in June/July 2003 and June/July 2005. At t_1 , 703 pupils (mean age: 13.53 years; $SD = 1.27$; Min = 11; Max = 17), 48.4% boys and 51.4% girls, from 36 classrooms participated in the study. Pupils were in sixth (43.8%) and eighth (56.3%) grade and attended different tracks of the German school system: 38.4% were pupils from Gymnasium (highest school track), 21.6% were pupils from Realschule (middle school track), and 39.9% were pupils from Hauptschule (lowest school track). The data from the first wave have been published elsewhere (Hofer *et al.*, 2007).

At t_2 , 363 pupils (mean age: 15.1 years; $SD = 1.1$), 44.0% male and 56.0% female, could be contacted again. Pupils remaining in the sample were less likely to be in the lowest school track, $\chi^2[1] = 28.32, p < .001$, were more likely to be in the middle school track, $\chi^2[1] = 10.35, p < .01$, or the highest school track, $\chi^2[1] = 9.09, p < .01$, had better grades in Mathematics, $t(682) = 5.27, p < .001$, English, $t(679) = 6.67, p < .001$, and German, $t(681) = 5.50, p < .001$. As in this part of Germany compulsory education ends when pupils reach the age of 15 and they are then free to decide whether to enter or continue one of the two higher school tracks or to quit school, many pupils from Hauptschule had left the school system and could not be contacted again. Therefore, the sample at t_2 is biased towards academically more successful pupils.

Procedure

The pupils answered a questionnaire containing the instruments needed to investigate the aforementioned assumptions. The complete questionnaire was administered during two consecutive regular school lessons with no teachers present. The school authority and the parents had given their consent. Pupils were instructed by a trained investigator and worked on their own. They were told that the study's goal was to learn about their attitudes and feelings towards school, leisure, and life in general. The instructor encouraged the pupils to ask him/her in case of any comprehension difficulties with regard to the questionnaire. Strict anonymity of all data was ensured. All pupils participated in the study voluntarily.

Variables

Value orientations

Achievement value orientation and well-being value orientation were measured with two value prototype items. The prototypes were originally derived from an interview study with adolescent pupils (Schmid, Hofer, Dietz, Reinders, & Fries, 2005). The items consisted of two comprehensive descriptions of pupils with different value orientations (64 and 69 words, respectively). The item for the achievement value prototype depicted a pupil, who has clear goals, struggles through uncomfortable tasks and has high standards of aspiration (e.g., 'For John it is mainly important to achieve something in life'). The item for the well-being value prototype described a pupil, who spends a lot of time with friends, loves diversion and spontaneous activities, and wants to have fun in life (e.g., 'If it were according to him life would only consist of free time'; for a detailed description of both prototypes, see Fries *et al.*, 2005). The prototype items were presented in gender congruent versions. Participants evaluated these value prototypes with respect to their similarity/dissimilarity to themselves on six-point rating scales labelled *very similar* (5), *rather similar* (4), *a little bit similar* (3), *a little bit dissimilar* (2), *rather dissimilar* (1), and *very dissimilar* (0). The rating scales were presented after the descriptions of both prototypes. The assessment of value orientations by value prototype items (Schwartz *et al.*, 2001) was shown to be feasible for younger pupils, since it is easily comprehensible (Bubeck & Bilsky, 2004). The test-retest reliability was determined by administering the value prototypes twice in an independent study ($N = 54$) with a 2-week interval in between. The reliabilities turned out to be satisfactory for well-being value orientation ($r_{tt} = .71$) but marginal for achievement value orientation ($r_{tt} = .58$).

Experience of motivational interference

In order to tap the experiences of motivational interference during studying and also during leisure, a scenario technique that depicted two situations of motivational conflict was used. These vignettes described conflict situations involving school and leisure activities. In the first vignette, the activities ‘studying for an exam’ and ‘meeting friends’ were contrasted:

Imagine you are sitting at your desk and are about to start studying for an upcoming exam, as the telephone rings. One of your friends is calling to ask whether you want to join him and have some fun. He’s about to drop by and pick you up.

In the second vignette, the competing activities were ‘doing your homework’ and ‘watching TV’.

After each scenario, pupils imagined to have chosen the school-related activity (‘Assume you stay home and study for the test and don’t meet your friends. What will happen?’). The pupils then answered 15 items about their mood and aspects of their performance for that hypothetical case on four-point rating scales. These items represented different aspects of conflict-related performance: distractibility (e.g., ‘While studying, I’ll be easily distracted’), depth of processing (e.g., ‘I’ll be soon completely absorbed in studying so that I won’t think about anything else’), persistence (e.g., ‘It’ll be very hard for me to keep on until the end’), switching (e.g., ‘I’ll start to study, but then switch to another activity quickly’), and mood (e.g., ‘I’ll get into a bad mood easily sitting at the desk while the others are having fun’). The answer categories were labelled *totally true* (3), *rather true* (2), *rather not true* (1), and *not true at all* (0). For the second vignette, the students answered similar items after imagining to have chosen to do homework. To test the uni-dimensionality of the motivational interference variables separate for both scenarios and both measurement points, exploratory factor analyses were run that resulted in one-factor solutions based on scree plots.

With regard to the leisure alternative, pupils imagined that they had chosen the leisure-related activity (‘Assume you meet your friends and don’t study for the test. What will happen?’). The pupils then answered seven items about two impairment aspects related to leisure activities: mood (e.g., ‘I’ll have a guilty conscience’) and distractibility (e.g., ‘I won’t be able to stop thinking about the fact that I should be studying for the test’) for that hypothetical case on four-point rating scales. Again for the second vignette, the students answered similar items after imagining to have chosen to do homework. The same answer categories as for motivational interference during studying were used. Exploratory factor analyses resulted in one-factor solution for both scenarios and both measurement points. Cronbach’s alpha as well as the amount of explained variance by each factor are displayed in Table 1.

Data analyses

To test the hypothesized relations, a series of analyses was conducted for both scenarios. First, regression analyses were calculated separately for the two assumed directions, that is, value orientations t_1 predicting motivational interference t_2 , as well as motivational interference t_1 predicting value orientations t_2 . Second, in integrative path analyses, these directions were tested simultaneously. In a next step, the structural weights of the path models were tested for invariance over age groups, sex, and school type to determine if the hypothesized relations hold in each of these

Table 1. Means, standard deviations, Cronbach's alpha, explained variance, ICC, design effect, and *t* tests for differences between *t*₁ and *t*₂

	<i>t</i> ₁ (2003)						<i>t</i> ₂ (2005)						<i>t</i>
	M	SD	α	Factor	ICC	Design effect	M	SD	α	Factor	ICC	Design effect	
	Achievement VO	3.54	1.13	–	–	.00	1.00	3.30	1.15	–	–	.00	
Well-being VO	2.78	1.40	–	–	.01	1.13	3.04	1.19	–	–	.03	1.29	–3.06**
MI studying, scenario 1	1.25	0.70	.93	49.52	.01	1.11	1.55	0.65	.92	45.72	.04	1.45	–8.26**
MI studying, scenario 2	1.24	0.64	.90	42.50	.06	1.67	1.36	0.70	.93	52.10	.00	1.00	–3.20**
MI leisure, scenario 1	1.75	0.73	.85	52.87	.01	1.12	1.52	0.80	.89	59.76	.04	1.46	5.52**
MI leisure, scenario 2	1.78	0.74	.83	50.81	.05	1.53	1.62	0.77	.86	55.24	.01	1.10	3.87**

Note. Scenario 1: studying versus meeting friends; scenario 2: doing homework versus watching TV; VO, value orientation; MI, experience of motivational interference; factor, per cent of explained variance by one factor-solution in exploratory factor analyses; ICC, intra-class correlation; design effect = 1 + (average cluster size – 1) × ICC; ***p* < .01.

subgroups. Interaction effects that were found to be significant in the regression and path analyses were further probed to get insight into the nature of these effects.

Results

Descriptive statistics

Table 1 further presents means, standard deviations, and intra-class correlations of all variables included in this study as well as the results of *t* tests for differences between t_1 and t_2 . Missing values were treated by multiple imputations with the expectation maximization algorithm of SPSS. Pupils indicated a high preference for both dimensions of value orientations, thus confirming results from value research (Inglehart & Baker, 2000; Ovadia, 2003). Results further showed that achievement value orientation decreased over time whereas well-being value orientation increased. Along with these changes, for both scenarios, there was an increase in the experience of motivational interference during studying and a decrease of motivational interference during leisure time. These results seem consistent with evidence showing that adolescents disengage psychologically from school as they mature from early into middle adolescence (Eccles, 2004). As the students are nested within classes, we calculated intra-class correlations. Table 1 shows that between 0 and 6% of the overall variance was between classes. The design effect was below 2 for all variables at both measurement points. As a result, this clustered structure can be disregarded for the following computations (Muthén & Muthén, 2009).

Correlation analyses

Table 2 shows the variables' intercorrelations. Contradictory to our expectation of orthogonality but consistent with other studies (e.g., Hofer *et al.*, 2007), the two value orientations were not independent from each other but displayed a rather high negative intercorrelation at both waves. For both conflict scenarios, as well as for both t_1 and t_2 , achievement value orientation was associated negatively with the experience of motivational interference during studying and positively with the experience of motivational interference during leisure activity. Students with high achievement value orientation obviously experienced their academic activities being less disturbed by leisure thoughts. For well-being values, the relationships were reversed. They were associated positively with the experience of motivational interference during studying and negatively with the experience of motivational interference during leisure. Thus, students with high well-being value orientation seemed to enjoy leisure while feeling distracted during studying. As can be seen in Table 2, the correlations with sex and age were rather low but significant in some cases. Analyses of variance were calculated to determine the influence of school type on the value as well as motivational interference variables. Analyses revealed that well-being value orientation t_2 ($F(2, 360) = 3.31$; $p = .04$), motivational interference leisure, scenario 1, t_2 ($F(2, 360) = 4.19$; $p = .02$) and motivational interference leisure, scenario 2, t_2 ($F(2, 360) = 4.50$; $p = .01$) differed significantly between school tracks. Accordingly, the variables sex, age, and school type are controlled for in the following analyses. Additionally, we examined the structural invariance across these groups.

Table 2. Intercorrelations between the variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>t</i> ₁													
1. Achievement VO	—												
2. Well-being VO	-.47**	—											
3. MI, studying, scenario 1	-.38**	.45**	—										
4. MI, studying, scenario 2	-.37**	.40**	.75**	—									
5. MI, leisure, scenario 1	.33**	-.35**	-.43**	-.31**	—								
6. MI, leisure, scenario 2	.29**	-.28**	-.26**	-.39**	.59**	—							
<i>t</i> ₂													
7. Achievement VO	.31**	-.14*	-.22**	-.13*	.22**	.17**	—						
8. Well-being VO	-.23**	.23**	.26**	.22**	-.24**	-.19**	-.42**	—					
9. MI, studying, scenario 1	-.27**	.26**	.50**	.40**	-.25**	-.20**	-.36**	.40**	—				
10. MI, studying, scenario 2	-.22**	.20**	.41**	.41**	-.22**	-.17**	-.36**	.36**	.66**	—			
11. MI, leisure, scenario 1	.23**	-.21**	-.26**	-.16**	.47**	.40**	.45**	-.47**	-.52**	-.42**	—		
12. MI, leisure, scenario 2	.21**	-.21**	-.23**	-.23**	.42**	.46**	.36**	-.38**	-.42**	-.51**	.71**	—	
13. Age	-.13*	.04	.05	.11*	-.07	-.17**	.02	-.13*	-.18**	-.08	.13*	-.01	—
14. Sex	.03	.01	.07	.08	-.07	-.12*	-.13*	.01	.01	.06	-.12*	-.11*	.04

Note. Scenario 1: studying versus meeting friends; scenario 2: homework versus TV; VO, value orientation; MI, experience of motivational interference; sex (0 = female; 1 = male); **p* < .05; ***p* < .01.

Regression analyses: Motivational interference as criterion

Measures of achievement value orientation, well-being value orientation, and their interaction at t_1 were entered as predictors for experience of motivational interference at t_2 , while controlling for experience of motivational interference at t_1 . The multiple regression analyses were calculated separately for each of the two scenarios in order to test the results' generalizability over different situations of school-leisure conflict. To avoid non-essential ill conditioning, all variables were mean centred before calculating the value orientations' products (see Cohen, Cohen, West, & Aiken, 2003). To control for sex, age, and school type, we entered these variables first in the regression equations throughout (the variable school type had been effect coded).

Results for both scenarios (see top part of Table 3) revealed that achievement value orientation at t_1 was associated significantly with experience of motivational interference during studying at t_2 . The higher pupils' achievement value orientation, the less motivational interference they experienced during studying after a school-leisure conflict ($t = -3.19$, $p < .01$, additional variance 2% for scenario 1; $t = -2.05$, $p < .05$, additional variance 1% for scenario 2). An effect of well-being value orientation on motivational interference could not be found. However, the interaction term between the value orientations turned out to be significant in the first scenario ($t = 2.60$, $p < .05$, additional variance 1%). The probing of this and the following significant interactions are shown after the path model.

Nearly the same picture results with regard to the influence of value orientations on experience of motivational interference during leisure after a school-leisure conflict showing reversed directions of relationships. In both scenarios, achievement value orientation influences the experience of motivational interference during leisure

Table 3. Multiple regressions for both directions

Predictors	Motivational interference during studying at t_2		Motivational interference during leisure at t_2	
	Scenario 1 <i>b</i>	Scenario 2 <i>b</i>	Scenario 1 <i>b</i>	Scenario 2 <i>b</i>
<i>Multiple regressions for experience of motivational interference during studying and leisure at t_2</i>				
MI t_1	.43**	.42**	.50**	.43**
Achievement VO t_1	-.11**	-.08*	.11*	.10*
Well-being VO t_1	-.02	-.01	.01	-.01
Interaction VO \times VO t_1	.05*	.03	-.04	-.06*
Predictors	Achievement VO at t_2		Well-being VO at t_2	
	Scenario 1 <i>b</i>	Scenario 2 <i>b</i>	Scenario 1 <i>b</i>	Scenario 2 <i>b</i>
<i>Multiple regressions for achievement and well-being value orientations at t_2</i>				
VO t_1	.25**	.30**	.10*	.14**
MI studying t_1	-.12	.04	.29**	.24*
MI leisure t_1	.18*	.11	-.25**	-.18*
Interaction MI \times MI t_1	.07	.21*	.14	.01

Note. MI, experience of motivational interference; VO, value orientation; scenario 1: studying versus meeting friends; scenario 2: homework versus TV; * $p < .05$; ** $p < .01$.

activities. With increasing achievement value orientation, pupils indicated experiencing increased motivational interference ($t = 2.56$, $p < .05$, additional variance 1% for scenario 1; $t = 2.40$, $p < .05$, additional variance 1% for scenario 2). Again, the regression coefficient of well-being value orientation did not reach significance and the influence of achievement value orientation was moderated by well-being value orientation, this time in scenario 2 ($t = -2.58$, $p < .05$, additional variance 1%).

Regression analyses: Value orientation as criterion

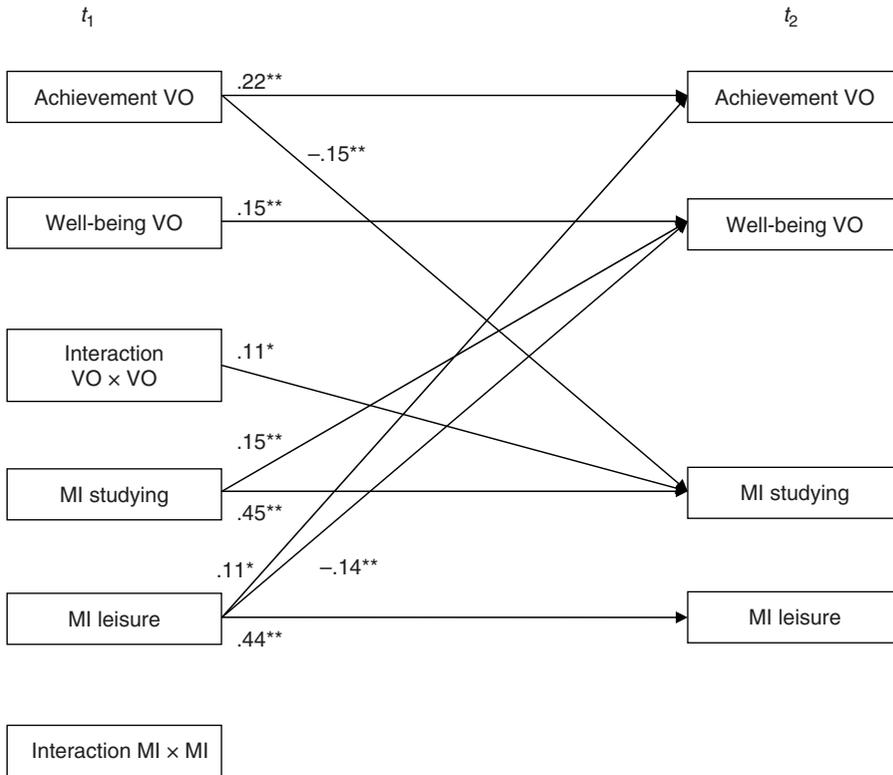
To test the prediction of changes in value orientations by experiences of motivational interference, in multiple regression analyses t_1 measures of experience of motivational interference during studying and leisure as well as their interaction were simultaneously used as predictors for achievement and well-being value orientations at t_2 while controlling for the respective value orientation at t_1 , sex, age, and school type.

For both scenarios (see bottom part of Table 3), pupils experiencing high motivational interference during studying changed their priorities consequently by valuing well-being more important than before ($t = 2.87$, $p < .01$, additional variance 2% for scenario 1; $t = 2.26$, $p < .05$, additional variance 1% for scenario 2). A complementary pattern can be seen with regard to motivational interference experienced during leisure. In both conflict situations, the more motivational interference pupils had experienced, the lower their well-being value orientation was at second measurement relative to those who had experienced motivational interference to a lesser degree ($t = -2.80$, $p < .01$, additional variance 2% for scenario 1; $t = -2.01$, $p < .05$, additional variance 1% for scenario 2).

The pattern is less clear for the effect of motivational interference on achievement value orientation. Only in scenario 1, the more motivational interference pupils had experienced during leisure, the higher their achievement value orientation was at t_2 ($t = 2.02$, $p < .05$, additional variance 1%). Furthermore in scenario 2, the two predictors showed a significant interaction on achievement value orientation ($t = 2.00$, $p < .05$, additional variance 1%).

Integrative path analyses and structural invariance

We tested path models using AMOS 7.0 in which all variables and their interactions were included and school type, sex, and age were used as control variables. Intercorrelations between the variables at both time points were included in the model. The results for scenario 1 are displayed in Figure 2 and for scenario 2 in Figure 3. The fit indices are good ($\chi^2[8] = 17.19$; CFI = .99; RMSEA = .06; SRMR = .02 for scenario 1, $\chi^2[8] = 13.66$; CFI = .99; RMSEA = .04; SRMR = .01 for scenario 2). Table 4 depicts the standardized path coefficients along with p values for the structural parts of the models for both scenarios. Structural invariance over age, sex, and school type for the non-controlled model is tested by setting the structural weights equal. Chi-square difference tests supported structural invariance across age (group 1: 11–13 years; group 2: 14–16 years) and school type in both scenarios and also sex in scenario 1. One exception was the difference test for sex in scenario 2 in which the chi-square value decreased significantly due to a discrepancy between boys and girls in the paths from the interaction term of motivational interferences t_1 to achievement value orientation t_2 and the paths from the interaction term of the value orientations t_1 to motivational interference studying t_2 . However, the overall fit of the model with the structural



$\chi^2 [8] = 17.19$; CFI = .99; RMSEA = .06; SRMR = .02

Figure 2. Path model scenario I: for clarity reasons, the control variables age, sex, and school type, the intercorrelations at both time points as well as all non-significant paths are omitted from the figure. VO, value orientation; MI, experience of motivational interference.

weights being equal for boys and girls was still acceptable (CFI = .97; RMSEA = .05; SRMR = .03). Generally, results of the path models were similar to those of the regression analyses. Achievement value orientation brings changes in motivational interference during studying. Pupils experiencing high motivational interference during studying changed their priorities consequently by relatively valuing the enjoyment of leisure activities higher in both scenarios. And, pupils experiencing deep enjoyment of leisure time tended to change their value orientations by giving less weight to academic values in scenario 1 and more weight to well-being values in both scenarios. The reciprocal effects show a meaningful pattern of changes.

Exploring interaction effects

To get insight into the nature of the interaction effects found in the regression and path analyses, Figure 4 depicts the relationships for low (one standard deviation below the mean), moderate (mean), and high (one standard deviation above the mean) values of the moderator variables. Additionally, the Johnson–Newman technique (Hayes & Matthes, 2009) was used to determine the exact value of the moderator for which the focal relationship turns from significant to not significant or vice versa.

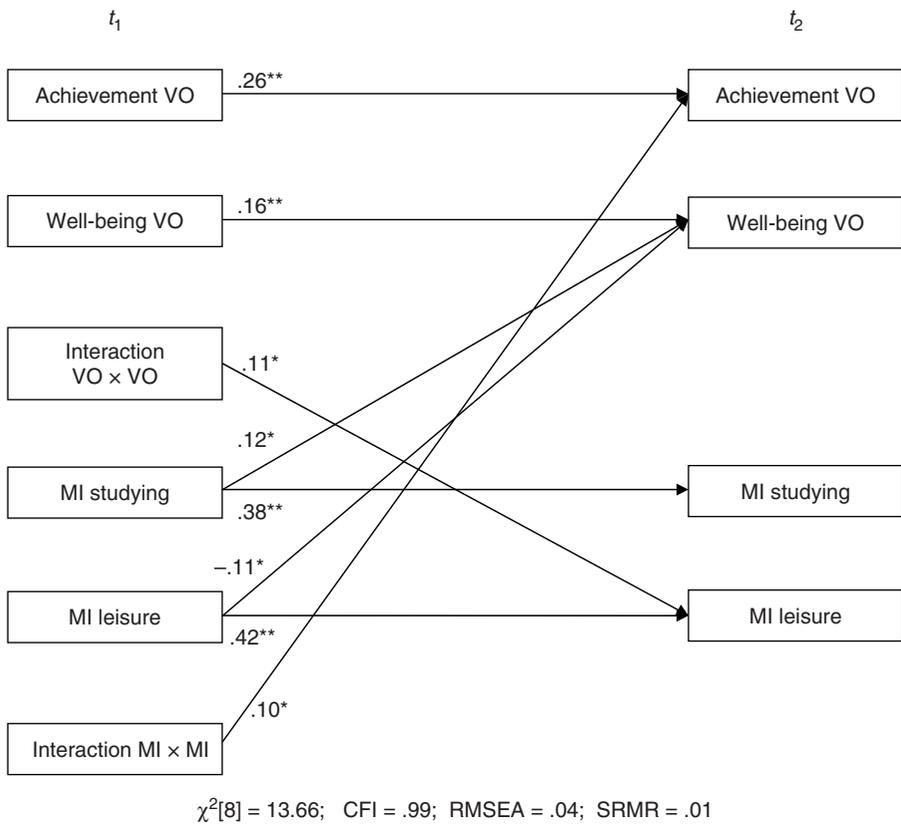


Figure 3. Path model scenario 2: for clarity reasons, the control variables age, sex, and school type, the intercorrelations at both time points as well as all non-significant paths are omitted from the figure. VO, value orientation; MI, experience of motivational interference.

Figure 4a highlights the significant interaction in scenario 1. The relationship between achievement value orientation (t_1) and motivational interference studying (t_2) is significant and negative if the well-being value orientation (t_1) is lower than 4.69. Thus, achievement value orientation accounts for the greatest share of change in experience of motivational interference during studying for pupils with not extremely high well-being value orientations. There are two further interactions significant in scenario 2. Figure 4b shows the first of these interactions. The relationship between achievement value orientation (t_1) and motivational interference leisure (t_2) is significant and positive if the well-being value orientation (t_1) is lower than 4.10. In conclusion, achievement value orientation exerts an influence on the experience of motivational interference during leisure, but only for subjects with low or medium well-being value orientation. For subjects with very high well-being value orientation, the effects disappear. The last significant interaction is shown in Figure 4c. The relation between motivational interference studying (t_1) and achievement value orientation (t_2) is only significant and negative if the motivational interference leisure (t_1) is lower than 1.44. Thus, the experience of motivational interference studying is only associated with lower achievement values for pupils whose experience of motivational interference during leisure is low at the same time.

Table 4. Path coefficients for the structural parts of the models

Independent variable	Dependent variable	Standardized path coefficient	<i>p</i>
<i>Scenario 1</i>			
Achievement VO t_1	Achievement VO t_2	.22	<.01
Achievement VO t_1	MI studying t_2	-.15	<.01
Achievement VO t_1	MI leisure t_2	.09	.08
Well-being VO t_1	Well-being VO t_2	.15	<.01
Well-being VO t_1	MI studying t_2	.00	.95
Well-being VO t_1	MI leisure t_2	-.04	.48
Interaction VO \times VO t_1	MI studying t_2	.11	<.05
Interaction VO \times VO t_1	MI leisure t_2	-.06	.20
MI studying t_1	MI studying t_2	.45	<.01
MI studying t_1	Achievement VO t_2	-.07	.20
MI studying t_1	Well-being VO t_2	.15	<.01
MI leisure t_1	MI leisure t_2	.44	<.01
MI leisure t_1	Achievement VO t_2	.11	<.05
MI leisure t_1	Well-being VO t_2	-.14	<.01
Interaction MI \times MI t_1	Achievement VO t_2	.04	.41
Interaction MI \times MI t_1	Well-being VO t_2	.07	.14
<i>Scenario 2</i>			
Achievement VO t_1	Achievement VO t_2	.26	<.01
Achievement VO t_1	MI studying t_2	-.09	.16
Achievement VO t_1	MI leisure t_2	.10	.10
Well-being VO t_1	Well-being VO t_2	.16	<.01
Well-being VO t_1	MI studying t_2	.01	.81
Well-being VO t_1	MI leisure t_2	-.05	.35
Interaction VO \times VO t_1	MI studying t_2	.05	.32
Interaction VO \times VO t_1	MI leisure t_2	-.11	<.05
MI studying t_1	MI studying t_2	.38	<.01
MI studying t_1	Achievement VO t_2	.02	.75
MI studying t_1	Well-being VO t_2	.12	<.05
MI leisure t_1	MI leisure t_2	.42	<.01
MI leisure t_1	Achievement VO t_2	.08	.15
MI leisure t_1	Well-being VO t_2	-.11	<.05
Interaction MI \times MI t_1	Achievement VO t_2	.10	<.05
Interaction MI \times MI t_1	Well-being VO t_2	.00	.93

Note. Scenario 1: studying versus meeting friends; scenario 2: doing homework versus watching TV; VO, value orientation; MI, experience of motivational interference.

Discussion

The central question of this study concerned the direction of effects between value orientations and experience of motivational interference. The tentative answer is that both influence directions are possible causes of the correlations between value orientations and motivational interference found in several cross-sectional studies (e.g., Fries *et al.*, 2005) but that motivational interference seems to influence value orientation to a higher degree than vice versa. In the following, the results for the effect of value orientation on experience of motivational interference and the effect of experiencing motivational interference on value orientation will be discussed in more detail.

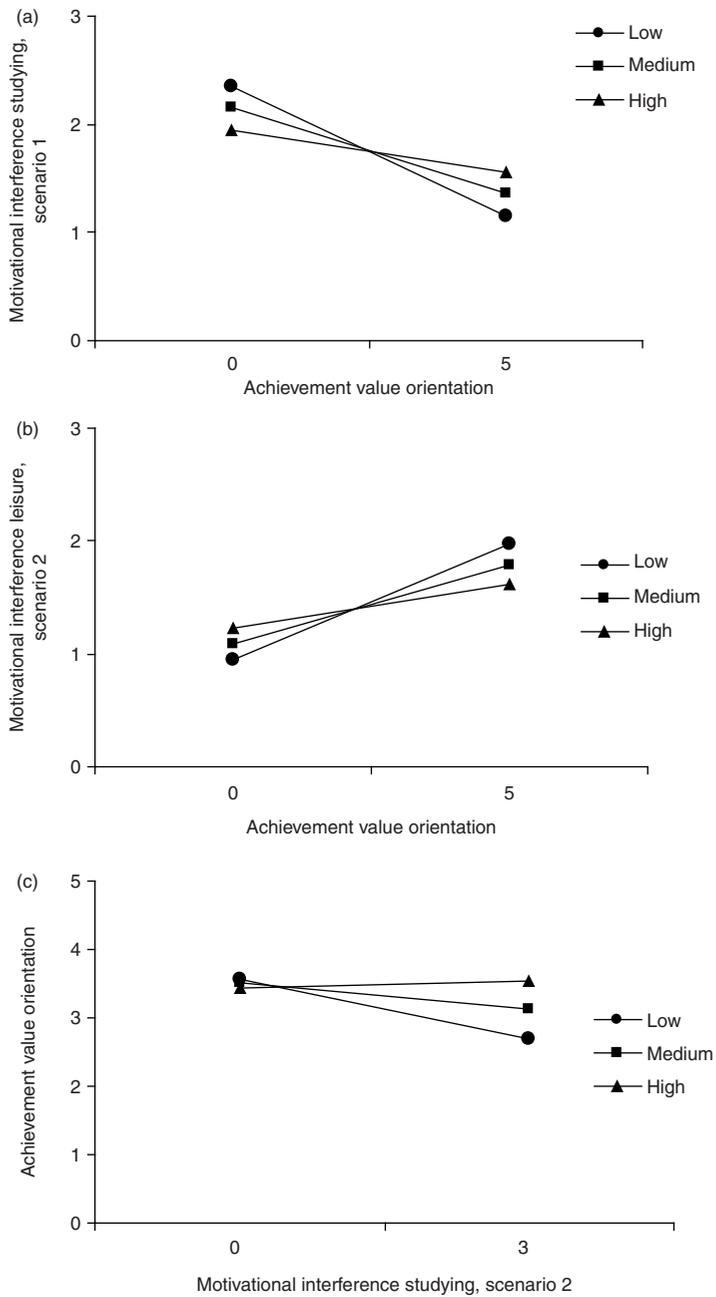


Figure 4. Probing of the interactions. (a) Probing of the interaction between achievement and well-being value orientation in predicting motivational interference studying scenario 1. (b) Probing of the interaction between achievement and well-being value orientation in predicting motivational interference leisure scenario 2. (c) Probing of the interaction between motivational interference studying and leisure scenario 2 in predicting achievement value orientation.

The results are consistent with the expectation that earlier achievement value orientations predict later experience of motivational interference during studying as well as during leisure. The latter result showed up in the regression analyses but not in the path model, in which also the intercorrelations between the dependent variables were controlled for. There is no such relation for well-being value orientation. Thus, the data only partially fit with our expectations. The interaction effect shows that achievement value orientation relates to changes in motivational interference only when well-being value orientation is low or moderate. Obviously, well-being value orientation undermines the effect of achievement value orientation on the experience of motivational interference. In an attempt to interpret this result, it is assumed that the cognitive resources of pupils with high well-being value orientation possibly are more easily absorbed by leisure activities. In such flow-like states, they might tend to forget that there are still school-related obligations waiting to be fulfilled. This tendency to forget could also explain the positive relationship of well-being values and procrastination (Dietz, Hofer, & Fries, 2007). Although the effect sizes are low as a whole the results are also consistent with the notion of the literature suggesting that values may result in changes of other cognitions and behaviour as shown in experimental studies (e.g., Verplanken & Holland, 2002). To our knowledge, this has not been demonstrated longitudinally so far. The findings fit also with the literature suggesting a motivating power stemming from the extent pupils value a task (e.g., Martin, 2007; Wigfield & Eccles, 2000) but value orientation transcending specific tasks is a much broader construct than task values.

When predicting changes in value orientations, effects both in terms of the regression analyses as well as in the path analysis result. Experience of motivational interference at t_1 is related to changes in well-being and achievement value orientations within the 2-year period. According to the path analyses in scenario 1, this result holds for motivational interference studying and well-being value orientation as well as for motivational interference leisure and both value orientations. In scenario 2, changes in well-being are related to experience of motivational interference studying and leisure at t_1 . Thus, concerning well-being value orientation a clear pattern emerges: well-being value orientation at t_2 is related to motivational interference t_1 for both scenarios but not vice versa. This suggests interpreting previously found cross-sectional correlations between those two constructs (e.g., Fries *et al.*, 2005) as more of an influence of motivational interference on well-being value orientation than the other way round. Possibly, well-being values are less cognitively activated and their potential to guide behaviour is limited because for students well-being values are quite intangible (Schmid *et al.*, 2005).

The interaction shows that the experience of motivational interference studying is associated with lower achievement values only for pupils with low motivational interference during leisure. This leads to the assumption that the experience of impairment during a school activity only leads to a downgrade of achievement values if the pupil experiences smoother performance in other life domains as they realize that experiencing motivational interference is not stable over different situational contexts.

Value orientations as dependent variables have not been studied longitudinally so far. In an attempt to interpret this relation, one can speculate that pupils experiencing distraction, bad mood, and lacking absorption in studying while their friends are engaged in leisure eventually may downgrade achievement values and will come to the conclusion to instead give higher priority to the values of leisure than before. The contrary may happen with pupils observing themselves as being highly absorbed in studying and not being tempted by attractive alternatives. As a result, they value learning

outcomes as more important and downgrade hedonic values. Complementary to and fitting into this interpretative framework, pupils who are not impeded by spending time with friends and watching TV instead of sticking to their duties for school, adapt their values accordingly, raising the importance they attribute to leisure, and devaluing the importance of achievement values. Generally speaking, an accumulation of positive experiences in a life area should raise values attached to this area while negative experiences should lower them.

This line of thinking resembles the idea that persons come to judge something as important that is connected with positive feelings. For instance, enjoying school has not only been shown as a predictor of math achievement but earning good grades predicts also the extent to which pupils value school (Helmke, 1993). If persons feel frustrated, tired, or see no sense in continuing working on a task, they tend to stop the activity (Sansone, Wiebe, & Morgan, 1999). They might think that it is not worth investing more time in it. Conversely, feelings of enjoyment and involvement are important aspects of interest-based activities (cf. Ainley, Hidi, & Berndorff, 2002; Pekrun *et al.*, 2002). Individual interests are characterized by a person-object relation that is valued highly and regarded as part of the person's inner self (Krapp, 2003). These findings suggest that the importance individuals attach to activities, objects, or class of goals depend on their cognitive and emotional experiences while acting in the respective area.

Important to note is that other variables not controlled for in the study may also have had an effect. The interpretation of the effect of interference on value change rests on the assumption that the adolescents experienced studying and leisure the way it was tapped by the questionnaire, both beyond the situations of the two scenarios used and throughout the intervening period. Repeated experiences of motivational interference during the 2-year interval are seen as the cause of changes. As these variables are of middle stability (see Table 2, test-retest correlations between .41 and .50) and as school-leisure conflicts seem to appear quite often in German pupils (see, Fries *et al.*, 2005), it is safe to assume also that motivational interference happened frequently during the intervening period, at least during school time. To prove these interpretations more, frequent assessments are needed.

Limitations to the study also apply to the operationalization of the variables. The two scenarios were designed to represent typical conflicts. Meeting friends and watching TV in principle are popular activities for youth in Western societies (see, e.g., Alsaker & Flammer, 1999; Larson & Verma, 1999). The respective variables are correlated to a moderate degree (see Table 2) indicating some generalizability. Though, possibly they do not cover the whole range of leisure. Especially, pupils might weight them differently according to individual variables such as extraversion. As all constructs were measured with self-report instruments, common method variance may inflate the relationships that emerged. The self-report validity for real-life behaviour may also be questioned. Notably, however, studies in which motivational conflicts were induced experimentally, showing that leisure alternatives waiting to be performed lead to motivational interference and impair learning results suggest that the measures used are reasonably valid indicators of motivational interference (Fries & Dietz, 2007). Therefore, it is less likely that the effects found in this study were merely limited to fictitious situations. Additionally, value orientations were measured by using only one item and future studies should operationalize value orientations by means of an increased number of prototypes. Overall, the low effect sizes found in this study might gain practical significance if further research finds variables that may moderate the effect of motivational interference on value orientations. Future orientation as a variable that varies inter-individually might

also be investigated. Theoretically, pupils with high future orientations may show better academic delay of gratification (see Bembenuddy & Karabenick, 2004). Pupils delaying gratification could experience less motivational interference only during studying. If they allow themselves to neglect their duties they possibly can enjoy the alternative action only to a limited degree because they ponder about their false step. On the other hand, students with low capacity of delay of gratification who tend to prefer the immediate over the future and possibly to procrastinate may value leisure and experience less interference during leisure time. This might increase the value they attach to the leisure domain at the expense of their valuing academic matters.

In conclusion, the theoretical background and the findings of this study generate a number of suggestions for future research on academic motivation. First, school-leisure conflict as a motivational dilemma is not only to be seen as a threat to academic motivation (Bembenuddy & Karabenick, 2004). Whereas school-leisure conflict is often perceived as a rivalry between beneficial long-term goals and alluring situational impulses, it can also be viewed as a competition between goals that stem from different life areas adolescents have to cope with. Leading a satisfactory life means that individuals devote their time to all areas relevant for their developmental tasks. Investing in various leisure activities might be as important for adolescent's development and well-being as studying for school. Second, the concept of motivational interference is introduced as a new concept in the literature in stating that in situations of goal competition the motivational features of non-chosen activities influence the regulation of chosen activities. In addition, the concept of value orientations seems relevant in cases in which classes of opposing goals come into conflict (Boekaerts *et al.*, 2006). Value orientations are introduced to predict the experience of motivational interference during studying and during leisure after a motivational conflict. Finally, the study gives a clue how pupils' values in the long term may change as a consequence of continuous positive or negative experiences in the respective areas. It will be worthwhile to follow these lines of thinking in future research.

Acknowledgements

The preparation of this manuscript was partially supported by a grant from the German Research Foundation (HO 649/17).

References

- Ainley, M., Hidi, S., & Berndorff, D. (2002). Interest, learning, and the psychological processes that mediate their relationship. *Journal of Educational Psychology, 94*, 545-561. doi:10.1037/0022-0663.94.3.545
- Alsaker, F. D., & Flammer, A. (Eds.), (1999). *The adolescent experience. European and American adolescents in the 1990s*. Hillsdale, NJ: Erlbaum.
- Bembenuddy, H., & Karabenick, S. A. (2004). Inherent association between academic delay of gratification, future time perspective, and self-regulated learning. *Educational Psychology Review, 16*, 35-57. doi:10.1023/B:EDPR.0000012344.34008.5c
- Boekaerts, M. (2003). Adolescence in Dutch culture: A self-regulation perspective. In F. Pajares & T. Urdan (Eds.), *Adolescence and education: International perspectives on adolescence and education* (Vol. 3, pp. 101-124). Greenwich, CT: Information Age Publishing.
- Boekaerts, M., de Koning, E., & Vedder, P. (2006). Goal-directed behavior and contextual factors in the classroom: An innovative approach to the study of multiple goals. *Educational Psychologist, 41*, 33-51. doi:10.1207/s15326985ep4101_5

- Bubeck, M., & Bilsky, W. (2004). Value structure at an early age. *Swiss Journal of Psychology*, 63, 31–41. doi:10.1024/1421-0185.63.1.31
- Cohen, J., Cohen, P., West, S., & Aiken, L. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Hillsdale, NJ: Erlbaum.
- Dietz, F., Hofer, M., & Fries, S. (2007). Individual values, learning routines and academic procrastination. *British Journal of Educational Psychology*, 77, 893–906. doi:10.1348/000709906X169076
- Eccles, J. S. (2004). Schools, academic motivation, and stage–environment fit. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 125–153). New York: Wiley.
- Eccles, J. S. (2005). Subjective task value and the Eccles *et al.* model of achievement-related choices. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 105–121). New York: Guilford Press.
- Feather, N. T. (1988). Values, valences, and course enrollment: Testing the role of personal values within an expectancy–valence framework. *Journal of Educational Psychology*, 80, 381–391. doi:10.1037/0022-0663.80.3.381
- Feather, N. T. (1990). Bridging the gap between values and actions: Recent applications of the expectancy–value model. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 151–192). New York: Guilford Press.
- Fries, S., & Dietz, F. (2007). Learning in the face of temptation. The case of motivational interference. *Journal of Experimental Education*, 76, 93–112. doi:10.3200/JEXE.76.1.93-112
- Fries, S., Dietz, F., & Schmid, S. (2008). Motivational interference in learning: The impact of leisure alternative activities on subsequent self-regulation. *Contemporary Educational Psychology*, 33, 119–133. doi:10.1016/j.cedpsych.2007.10.001
- Fries, S., Schmid, S., Dietz, F., & Hofer, M. (2005). Conflicting values and their impact on learning. *European Journal of Psychology of Education*, 19, 259–273. doi:10.1007/BF03173556
- Fries, S., Schmid, S., & Hofer, M. (2007). On the relationship between value orientation, valences, and academic achievement. *European Journal of Psychology of Education*, 22, 201–216. doi:10.1007/BF03173522
- Gardner, W. L., Gabriel, S., & Lee, A. Y. (1999). ‘I’ value freedom, but ‘we’ value relationships: Self-construal priming mirrors cultural differences in judgment. *Psychological Science*, 10, 321–326. doi:10.1111/1467-9280.00162
- Green, L., & Myerson, J. (2004). A discounting framework for choice with delayed and probabilistic rewards. *Psychological Bulletin*, 130, 769–792. doi:10.1037/0033-2909.130.5.769
- Greenfield, P. M., Keller, H., Fuligni, A., & Maynard, A. (2003). Cultural pathways through universal development. *Annual Review of Psychology*, 54, 461–490. doi:10.1146/annurev.psych.54.101601.145221
- Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods*, 41, 924–936. doi:10.3758/BRM.41.3.924
- Helmke, A. (1993). Die Entwicklung der Lernfreude vom Kindergarten bis zur 5. Klassenstufe [Development of affective attitudes towards learning from kindergarten to grade five]. *Zeitschrift fuer Paedagogische Psychologie*, 7, 77–86.
- Hofer, M. (2010). Adolescents’ development of individual interests: A product of multiple goal regulation? *Educational Psychologist*, 45(3), 149–166. doi:10.1080/00461520.2010.493469
- Hofer, M., Schmid, S., Fries, S., Dietz, F., Clausen, M., & Reinders, H. (2007). Individual values, motivational conflicts, and learning for school. *Learning and Instruction*, 17, 17–28. doi:10.1016/j.learninstruc.2006.11.003
- Hofer, M., Schmid, S., Fries, S., Zivkovic, I., & Dietz, F. (2009). Value orientations and studying in school–leisure conflict: A study with samples from five countries. *Learning and Individual Differences*, 19, 101–112. doi:10.1016/j.lindif.2008.09.007

- Hofer, M., Schmid, S., & Zivkovic, I. (2008). Schule-Freizeit-Konflikte, Wertorientierungen und motivationale Interferenz in der Freizeit. Eine kulturübergreifende Studie [School-Leisure Conflict, Value Orientations, and Motivational Interference during Leisure. A Cross-Cultural Study]. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, *40*, 55-68. doi:10.1026/0049-8637.40.2.55
- Hofstede, G., & Hofstede, G. J. (2005). *Cultures and organizations: Software of the mind. Intercultural cooperation and its importance for survival*. New York: McGraw-Hill.
- Husman, J., & Lens, W. (1999). The role of the future in student motivation. *Educational Psychologist*, *34*, 113-125. doi:10.1207/s15326985ep3402_4
- Inglehart, R. (1997). *Modernization and postmodernization*. Princeton, NJ: Princeton University Press.
- Inglehart, R., & Baker, W. E. (2000). Modernization, cultural change, and the persistence of traditional values. *American Sociological Review*, *65*, 19-51. doi:10.2307/2657288
- Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change, and democracy*. New York: Cambridge University Press.
- Kirby, K. N. (1997). Bidding on the future: Evidence against normative discounting of delayed rewards. *Journal of Experimental Psychology: General*, *126*, 54-70. doi:10.1037/0096-3445.126.1.54
- Krapp, A. (2003). Interest and human development: An educational-psychological perspective. *British Journal of Educational Psychology. Monograph Series II (2) Development and Motivation*, 57-84.
- Larson, R. W., & Verma, S. (1999). How children and adolescents spend time cross the world: Work, play, and developmental opportunities. *Psychological Bulletin*, *125*, 701-736. doi:10.1037/0033-2909.125.6.701
- Martin, A. J. (2007). Examining a multidimensional model of student motivation and engagement using a construct validation approach. *British Journal of Educational Psychology*, *77*, 413-440. doi:10.1348/000709906X118036
- Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification. Dynamics and willpower. *Psychological Review*, *106*, 3-19. doi:10.1037/0033-295X.106.1.3
- Muthén, L. K., & Muthén, B. O. (2009). Intraclass correlations. *Mplus Discussion*. Retrieved from <http://www.statmodel.com/discussion/messages/12/18.html>
- Ovadia, S. (2003). Suggestions of the postmodern self: Value changes in American high school students 1976-1996. *Sociological Perspectives*, *46*, 239-256. doi:10.1525/sop.2003.46.2.239
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist*, *37*, 91-105. doi:10.1207/S15326985EP3702_4
- Rachlin, H., Brown, J., & Cross, D. (2000). Discounting in judgments of delay and probability. *Journal of Behavioral Decision Making*, *13*, 145-159. doi:10.1002/(SICI)1099-0771(200004/06)13:2<145::AID-BDM320>3.0.CO;2-4
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Sansone, C., Wiebe, D. J., & Morgan, C. (1999). Self-regulating interest: The moderating role of hardiness and conscientiousness. *Journal of Personality*, *67*, 701-733. doi:10.1111/1467-6494.00070
- Schmid, S., Hofer, M., Dietz, F., Reinders, H., & Fries, S. (2005). Value orientations and action conflicts in students' everyday life: An interview study. *European Journal of Psychology of Education*, *20*, 243-257. doi:10.1007/BF03173555
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in Experimental Social Psychology*, (Vol. 25, pp. 1-65). New York: Academic Press.
- Schwartz, S. H. (2006). A theory of cultural value orientations: Explication and applications. *Comparative Sociology*, *5*, 137-182. doi:10.1163/156913306778667357
- Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., & Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values with a different

- method of measurement. *Journal of Cross-Cultural Psychology*, 32, 519-542. doi:10.1177/0022022101032005001
- Sheldon, K. M. (2005). Positive value change during college: Normative trends and individual differences. *Journal of Research in Personality*, 39, 209-223. doi:10.1016/j.jrp.2004.02.002
- Smeesters, D., Warlop, E., & Van Avermaet, E. (2003). Do not prime hawks with doves: The interplay of construct activation and consistency of social value. *Journal of Personality and Social Psychology*, 84, 972-987. doi:10.1037/0022-3514.84.5.972
- Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, 133, 65-94. doi:10.1037/0033-2909.133.1.65
- Verkasalo, M., Goodwin, R., & Bezmenova, I. (2006). Values following a major terrorist incident: Finnish adolescent and student values before and after September 11, 2001. *Journal of Applied Social Psychology*, 36, 144-160. doi:10.1111/j.0021-9029:2006.00007
- Verplanken, B., & Holland, R. W. (2002). Motivated decision making: Effects of activation and self-centrality of values on choices and behavior. *Journal of Personality and Social Psychology*, 82, 434-447. doi:10.1037/0022-3514.82.3.434
- Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of motivation. *Contemporary Educational Psychology*, 25, 68-81. doi:10.1006/ceps.1999.1015
- Wolters, C. A. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist*, 38, 189-205. doi:10.1207/S15326985EP3804_1

Received 11 June 2009; revised version received 27 January 2010