Paper IV

Are Changes in Students' Perceptions of the Learning Environment related to changes in Emotional and Behavioural Problems?

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Abstract

Previous survey based research suggests that students' perceptions of the learning environment are associated with emotional and behavioural problems (EBP). However, it is not clear to what extent the associations identified are merely reflections of individual student characteristics. The present study explored this issue by utilizing a one group pretest-posttest design to minimize the influence of individual characteristics on associations of perceived learning environment with EBP. Moreover, by connecting the study to a planned restructuring of the learning environment occurring in a Norwegian secondary school, it was also explored how changes in the learning environment might affect EBP. Results suggest that associations between learning environment factors (LEF) and EBP are not merely reflections of individual characteristics. Change in off-task-orientation was significantly associated with changes in all LEF, strongest with meaningfulness of schoolwork, teachers' emotional support and adaptation of schoolwork. Changes in teachers' monitoring, emotional and academic support were the strongest predictors of change in externalising problems. These factors were also significantly associated with change in emotional problems, together with changes in student influence and meaningfulness of schoolwork.

Keywords: Learning environment, coping, emotional and behavioural problems

Introduction

The number of schoolchildren with emotional and behavioural problems (EBP) seems to have increased in recent decades. This represents a major challenge to schools in Norway and the rest of the western world (Achenbach, Dumenci, & Rescorla, 2002; Chazan, Laing, & Davies, 1994; Collishaw et al., 2004; Nordahl & Sørlie, 1998; Rutter & Smith, 1995; West & Sweeting, 2003; Winkley, 1996). Several studies suggest that EBP are related to learning environment factors (LEF) (e.g. Bru et al., 1998; Firestone & Rosenblum, 1988; Fraser & Fisher 1982; Merrett & Wheldall 1987; Moos, 1979; Short & Shapiro 1993; Thuen, Bru, & Ogden, submitted). However, most of these studies are based on survey design using single-level approaches to analysis, and more recent research using multi-level approaches (e.g. Anderman, 2002; Bru, Stephens, & Martinsen, 2002) have shown that it is primarily the individual level variance of perceived LEF that accounts for variance in EBP. One can therefore not rule out that the identified associations primarily are reflections of individual characteristics of the students, such as appraisal and/or coping styles, and do not indicate that experience of the learning environment affects EBP. In the present study we will utilize a one group pretest-posttest design to minimize the influence of individual characteristics on associations of perceived LEF on EBP. Moreover, by connecting the study to a planned restructuring of the learning environment occurring in a Norwegian secondary school, we will also explore how changes in the learning environment might affect emotional and behavioural problems.

The restructuring of the learning environment intended to better facilitate for individual adapted learning and increased student responsibility for, as well as influence, over his and her learning processes. This restructuring was accompanied by a change in the teacher's role towards a greater emphasis on guidance of students, either individually or in

groups. Moreover, the teachers spent more time in direct contact with students. The new arrangements made it possible for two teachers to take responsibility for half of the students in each class (never more than 15). The students involved in the study were 14 to 16 years old. These changes are likely to affect learning environment factors that are believed to influence emotional and behavioural problems.

Student influence

A main aim of the restructuring was to increase students` influence over their own learning situation, and thereby increase the likelihood that students would become active learners. This focus is consistent with a social cultural perspective which views learning as an active process, taking place in interactions with other more knowledgeable persons (e.g. Vygotsky, 1978). From this perspective, the student is not regarded as a passive recipient of knowledge transmitted by the teacher, but as an active participant in social interaction with other individuals within a social cultural context, where the teachers` role is to facilitate learning. The students involved accordingly made their own individual study plans, following guidelines set by their teachers. They were allowed to make a considerable number of choices, such as describing goals of a subject and tasks to reach those goals, how to work with a subject, whom to work with and where to work. Previous research suggests that students who perceive the classroom climate as allowing them a degree of autonomy are more committed and intrinsically motivated and display more on-task-orientation than students who regard the climate as more controlling (Firestone & Rosenblum 1988; Grolnick & Ryan 1987; Ryan & Deci, 2002; Thuen & Bru, 2000). Eccles & Roeser (1999) found that a learning environment characterised by student discussions and opportunities to influence the schoolwork and the rules and norms in class have positive effects on students' interest in and appreciation of the school. Studies also indicate that teachers can promote student self-

responsibility and adjustment by engaging them in the planning and management of educational tasks (Wang & Zollers, 1990), and that the encouragement of students to set their own goals contributes to engagement and more time spent on learning activities (van Merrienboer & Paas, 2003). Other research shows that students who are allowed to engage in interactions with others in the classroom, learn in a fundamentally different way and show more motivation and effort, compared to students who are listen passively to teachers presentation (Slavin, 1996). Results from this previous research lead to the anticipation that improved on-task-orientation will be associated with an increase in perceived student influence.

Associations of changes in externalizing problems in the form of conflict with teachers and peers in class with changes in perceived student influence may be more difficult to predict. Mechanisms that are believed to affect on-task-orientation may also lead to a reduction in externalizing problems. However, previous research has shown a tendency for students exhibiting such behaviours to be impulsive, more easily distracted, less structured and less persevering in their approach to learning (Eysenck, 1982; Loeber, 1990; Rutter, Giller, & Hagell, 1998). Such students might well find it more difficult to cope with increased responsibility for organizing their own learning tasks. Moreover, increased autonomy could imply an increased possibility of students pursuing their own goals. Wenzel (1989) found that adolescents were more concerned with social goals than learning goals. Results from a previous Norwegian study (Bru, 2006) indicate that about 20% percent of adolescents believe that going against school norms will increase their popularity among peers and that such belief are significantly associated with conflicts with teachers. Some students may take advantage of their increased freedom to pursue goals that are in conflict with school norms or learning goals, and this may result in increased occurrence of externalizing problems.

Support from teachers

The reorganisation of teaching described in this study enabled teachers to spend more time in contact with individual students. Through the individual guidance of students, teachers and students may become more familiar and establish closer relationships. Thus the intended restructuring in the learning environment is likely to result in students perceiving more academic as well as emotional support from teachers. Previous research has shown that *academic teacher support* is related to more success and less frustration, withdrawal or 'playing up' (Atwood,1983; Evertson & Emmer, 1982), to a better academic competence and lower incidence of student misbehaviour (Rutter, Giller, & Hagell, 1998), to increased concentration (Thuen & Bru, 2000; Thuen, Bru, & Ogden, submitted), and that lack of academic support, in particular, could be a risk factor for emotional problems among young adolescents (Bru et al., 1998). Similarly, studies indicate that perceived *emotional teacher support* is likely to be related to enjoyment of learning, motivation for academic success, task engagement and the reduction of emotional and behavioural problems (Bru, et al., 1998; Connell & Wellborn, 1991; Fraser & Fisher, 1982; Merrett & Wheldall ,1987; Moos, 1979; Murberg & Bru, 2003; Thuen & Bru, 2000; Thuen, Bru, & Ogden, submitted).

According to social control theorists, feeling a sense of belonging and connectedness within the context of school increases an individual's involvement with prosocial groups and provides opportunity for the acquisition of prosocial skills and behaviours (Hirshi, 1969). Relationships with teachers and bonds with school can also inhibit inappropriate social behaviour if such behaviours jeopardize continued support and membership within the school context (Hawkins & Catelano, 1992). Previous research with students has found relations between school bonding, in form of liking school and caring about what teachers thought of them, and rates of delinquency (Hirshi, 1969), and between low levels of emotional support and involvement with teachers and dysfunctional characteristics, such as delinquency and

conduct problems (Muarray & Greenberg, 2000). In this way emotional support could affect externalising problems directly.

Positive connections to teachers and school could also contribute to better emotional adjustment among students (Bretherton & Munholland, 1999; Resnick et al, 1997;). Psychologically vulnerable students often have a heightened need to feel secure, and a more caring and supportive relationship with teachers is likely to foster a learning environment in which these students in greater degree might feel safe and comfortable. Previous research suggests that such feelings are related to lower levels of emotional problems (Murray & Greenberg, 2000; Resnick, 1997). According to attachment theory (Ainsworth et al, 1978; Bowlby, 1982), warm and supportive relationships influence social and emotional development through internalised models of accessibility and support. Finally, warm and supportive relationships with teachers may improve emotional well-being through positive effects on students' self-esteem (Davial et al, 1995; Lamarine, 1995).

Individual guidance and adaptation of schoolwork

The changes in the learning environment were also intended to facilitate teaching adapted to the individual student. Through increased emphasis on guidance of individual and small groups of students, teachers should be more able to attend to the individuality of the students and to adapt their support accordingly. In the same way individual guidance was believed to make it easier to adapt the learning material to the individual student's interests and skills. Previous findings suggest that adaptive education reduces the risk of adjustment problems by maximizing students' opportunities for learning success (Wang & Wahlberg, 1985; Wang & Zollers, 1990). Boekarts (2001) identified instruction and support that are not adapted to the needs and values of students as key elements in unfavourable conditions for learning. These may lead to frustration related to the learning process and thereby make EBP

more likely. By contrast, learning materials that provide an appropriate level of challenge for a given student promote effort, investment and interest in learning, and a likely result is more on-task-behaviour (Eccles & Roeser, 1999). Finally, in a study among middle school students, results indicated greater motivation and academic engagement when teachers adapted instruction to the individual needs of students (Meece, 2003).

Teacher monitoring

The student centred strategy with individual study plans and guidance, together with teachers spending more time in classrooms, may also give teachers more opportunities to *monitor* students' work and behaviour. At the same time, the school policy underlines the importance of monitoring in order to follow up and regulate students' behaviour, when students' freedom increases in the way the restructuring entails. Previous research indicates that carefully monitoring schoolwork and behaviour seem to prevent or reduce behavioural problems (Doyle & Carter, 1987; Levin & Nolan, 1996; Mortimore et al., 1988).

Peer relationships at school

Research into *peer relationships* in school has shown that close and harmonious relationships with classmates are related to good social and academic adjustment (Damon, 1984; Furman a& Gavin, 1989), and evidence from other studies, (e.g. Berndt & Keefe, 1995; Murberg & Bru, 2003; Thuen, Bru, & Ogden, submitted) indicates that poor relationships with peers at school primarily represent a risk factor for the development of emotional problems. While the restructuring described in this study was not primarily concerned with improving students' peer relationships, it is felt that the focus on students as active learners is likely to increase student-cooperation and thereby improve relations between classmates. However, relationships between students could equally well be in danger of

negative development if some of them were to take advantage of their increased freedom in order to escape their teachers' attention.

Competition for grades

The relation between *competition for grades* and EBP is likely to be complex (Deci & Ryan, 1992). On the one hand, competition for grades may contribute to improved motivation by strengthening the incentive value of school subjects. This positive effect of competition will particularly be the case for students who perceive that they are succeeding in school or are doing better than others (Deci & Ryan, 1992). On the other hand, competition can contribute to fear of failure, which is likely to have negative motivational and psychological effects, especially for low achieving students. Previous research has shown only trivial associations between competition for grades and emotional and behavioural problems (Thuen & Bru, 2000; Thuen, Bru, & Ogden, submitted), suggesting that these different aspects of competition for grades counteract to produce weak associations. The individual focus of the restructuring, with students working on different tasks at the same time, may contribute to less social comparison, and a likely result could be less competition for grades.

Meaningfulness of schoolwork

The student centred approach with individual study plans, teacher guidance and student influence and responsibility over their learning situation, are all factors that are likely to promote greater involvement and deeper understanding of the schoolwork. Moreover the adaptation of learning task may also make it more possible to choose an approach to learning that appeal more to students' intrinsic interests, which in turn could increase the possibilities of students finding the schoolwork more meaningful. Students' perceptions of the *meaningfulness of schoolwork* are believed to be an important factor as far as both motivation

and behaviour are concerned. According to Atkinson (1964), incentive value (defined as the relative attractiveness of a goal) has a strong bearing on motivation. Eccles (1983) emphasises the intrinsic value of the task, namely the enjoyment an individual obtains from engaging in the activity and the utility value of the task as a main contributor to motivation. The link between perceived relevance of schoolwork and on-task-orientation, together with increased effort in task fulfilment and a higher level of student engagement in learning activities, has also been indicated by empirical research (Cennamo & Braunlich, 1996; Mortimore et al., 1988; Stevenson, 1990; Thuen & Bru, 2000).

Moreover, Thuen, Bru, & Ogden (submitted) found that the perceived meaningfulness of schoolwork was related to externalising problems. This association could be mediated through off-task-orientation reflecting disputes between students and teachers concerning the students' reluctance to accomplish school tasks. However, it is possible that students who find schoolwork of little interest may perceive school as a worthless institution whose norms should be opposed. As the teachers are seen as representing the system, they may well become the targets of such anti-school feelings. Moreover, students may express their disrespect for teachers who are unable to convey subjects in ways that they find interesting and meaningful by displays of oppositional behaviour. In these ways a more direct link between perceived relevance of schoolwork and externalising problems could be created.

Does the restructuring work differently for students with different coping styles?

The restructuring of the learning environment is designed to improve the adaptation of teaching to all students. However, key elements of the restructured learning environment may suit some students more than others. In the present study we have included the measurement of individual coping styles to address this issue. Coping refers to cognitive, emotional and behavioural efforts to meet challenges or overcome demands (Lazarus & Folkman, 1984), and

coping *styles* refers to the dispositional or habitual aspect of people's approach to stressful or challenging situations (compare; Carver, Scheier, & Weintraub,1989; Costa, Somerfield, & McCrae, 1996; McCrae & Costa, 1986). Previous research with survey design found significant, although weak, interactions between students' coping styles and learning environment factors (Thuen, Bru, & Ogden, submitted). The design of the present study, where the learning environment is subjected to change, and coping styles are measured at pre-restructuring, allows, however, for a better investigation of how changes in the learning environment affect students, dependent on their coping styles.

Students who frequently use problem-focused coping like *planning* and *seeking social support* are perhaps to a greater degree than students using less of these coping styles more able to manage a learning environment characterised by increased student autonomy and responsibility, where the individual planning and management of the schoolwork is central. However, increased teacher support and individual student guidance may compensate for such inability to cope, and counteract the tendency to give in (much use of *behavioural disengagement*) to problems at school. Moreover, students who tend to *cope aggressively* with problems may take advantage of learning environments with "looser" structures by indulging in disruptive behaviour. However, increased monitoring could reduce this risk. Finally, emphasis on students' responsibility for their own learning could aggravate the tendency of some to *blame themselves* for problems. Increased teacher support and individual guidance could however compensate for this.

Methods

The restructuring

The restructuring was introduced in a Norwegian secondary school with 350 students, planned and carried out by all members of the school staff. Before the restructuring the school

had a traditional teacher directed approach to teaching, although it did employ more student active teaching methods, such as project work, from time to time. The project involved restructuring the learning environment in order to enable individual adapted learning to take place and to increase students' responsibility for and influence over their own learning conditions. The process involved teachers placing greater emphasis on guiding students individually and in groups. Students made their own individual study plan, following guidelines provided by the teachers, describing the goals, tasks and working methods in the different subjects, for a period of one or two weeks. Teachers provided students with necessary help in this process. At the end of the period each student evaluated his or her work together with the teachers. Teachers' instruction to the whole class was reduced to a minimum, mostly in order to go through the plan for the week and convey new subjects content. In addition to this planned instruction, teachers also gathered groups of students to elaborate on subject matter when there was a need for that. However, most of the time the students worked according to their own study plans, alone or in groups, with guidance/help and supervision from their teachers. Finally, the teachers spent more time in direct contact with students. This made it possible for each class to have two class teachers, each with responsibility for half of the students, maximum 15 students.

Design and sample

The research design could be characterized as a "one-group pretest-posttest design" (Cook, 1979) in which it was possible to track individual students' responses between times of measurements. The design was utilized to study 1) pre-post changes, 2) associations of within-subject changes in the learning environment with emotional and behavioural problems, as well as, and 3) to study if the changes in EBP could be predicted by coping styles measured in pre-test.

Data was collected at three points with twelve month intervals (in 2000, 2001 and 2002). At pre-test (May 2000) the respondents were attending 8th and 9th grade. These students were followed up after one year, and at post-test (May 2001) they were attending 9th and 10th grade. A total of 158 8th and 9th graders were included at pre-test, and of these, 119 (75%) completed post-test after one year. Thus, the final pre-post-test sample study comprised 119 students. Data from 2002 was not used to create a longitudinal design with three points of measurements because the sample would have been too small.

The total sample comprised 245 students in 2000, 248 students in 2001 and 287 students in 2002, including students from 8th to 10th grade. This sample was used to correct age related changes in students' perceptions of the learning environment and reports of emotional and behavioural problems. See procedures below for more details about this.

Measures

Emotional and behavioural problems

    Emotional problems (α=.88) were assessed using seven slightly modified items from the Hopkins Symptom Checklist (Derogatis et al., 1974). Items for emotional problems had a four-step scoring format with the following response categories: "No complaints", "Mild complaints", "Moderate complaints" and "Severe complaints". *Off-task-orientation* (α=.71) and *Externalising problems* (α=.71) were assessed by two scales documented by our research institute. The scale for off-task-orientation included 4 items, with a four-step scoring format as follows: "Disagree strongly", "Disagree a little", "Agree a little" and "Agree very much", and externalising problems were assessed by 5 items with the following response categories: "Never", "Sometimes ", "Weekly" and "Daily". The scales assessing EBP are documented by Thuen & Bru (2004).

Coping styles

Coping styles were assessed by five subscales: *Planning* (8 item, α=.79), *Social support seeking* (8 item, α=.84), *Behavioural disengagement (*4 item, α=.64), based on selected scales from The COPE scale (Carver et al., 1989), *Self-blame* (4 item, α=.70) (Vitaliano et al., 1985) and *Aggressive coping* (3 item, α=.63), based on a scale developed by Dise-Lewis (1988). From this scale two items that were likely to overlap in content with items in the scale on externalising problems were excluded. The coping scales had a four-step scoring format identical to the one used in the COPE scale: "I usually don't do this at all", "I usually do this a little bit ", "I usually do this a medium amount " and "I usually do this a lot", indicating the frequency with which students use the different styles. The introduction to the coping scale was derived from the dispositional version of the COPE scale, and focuses on how students usually cope with social and academic stress at school. The scales assessing coping styles are documented by Thuen & Bru (2004).

Learning environment factors

Students' perceptions of the learning environment were assessed by slightly modified version of scales previously documented by our research institute (Bru et al., 1998; Bru, Stephens, & Martinsen, 2002; Thuen & Bru, 2000). The scales were constructed to assess students' perceptions of *teachers' emotional support* (6 item, α=.79), *teachers' academic support* (4 item, α=.82), *teachers' monitoring* (6 item, α=.70), *relationships between classmates* (4 item, α=.79), *student influence(*(4 item, α=.67), *competition for grades* (4 item, α=.87), and *students `perceptions of the meaningfulness of schoolwork* (3 item, α=.71). In order to assess key elements of the intervention, two additional scales were developed for the present study. These scales were constructed to assess *teachers' guidance of students* (4 item, α=.80), and *adaptation of schoolwork* (4 item, α=.73). All scales, except students'

perceptions of the meaningfulness of schoolwork, had a four-step scoring format; 'Disagree strongly', 'Disagree a little', 'Agree a little', and 'Agree very much', while students' perceptions of the meaningfulness of schoolwork were assessed by a semantic differential scale. See appendix for wording of items in scales developed for this study.

Procedures

Data was collected through qustionnaires that students completed during a regular 45-minute classroom period with a teacher present. Each student was given an identification number that made it possible to track individual students from pre-test to post-test. Statistical analyses were conducted using SPSS (Norusis, 2000), and included product-moment-correlations, partial correlations, reliability testing (Cronbachs alpha), and multivariate analysis of variance computed by the general linear (GLM) module, Repeated Measures Procedure. Bonferroni correction was implemented to adjust for the number of comparisons conducted.

Previous studies (e.g. Bru, Stephens, & Martinsen, 2002; Byberg & Tybring, 2004) have revealed a stable age trend for students' responses to scales assessing learning environment factors and emotional and behavioural problems. Corresponding age trends were seen in the present sample (see appendix), and post-test scores for learning environment factors and EBP were therefore corrected for these age trends. These corrections were conducted by first computing the quotients for differences in mean scores between 8th and 9th grade (9th grade scores / 8th grade scores) and between 9th and 10th grade (10th grade scores / 9th grade scores), respectively for each of the included variables, and then multiplying post-test scores by the appropriate quotient.

Results

Insert Table I about here

Results of GLM repeated measures procedure (table I) showed few significant changes for scores of learning environment factors from pre-test to post-test. Only changes in "Student influence" from pre-test to post-test were clearly significant. For "Teachers' emotional support" and " Teachers' monitoring" the GLM repeated measures procedure of differences between pre-test and post-test scores indicated marginally significant changes. Results showed marked increase in standard deviations for "Meaningfulness of schoolwork", "Teacher guidance" and "Teachers' monitoring". For the dependent variables, the analyses indicated a significant decrease in "Off-task-orientation", and a marginally significant decrease in "Emotional problems". On the other hand, for "Externalising problems", a statistically significant increase was detected.

Insert Table II about here

Analyses of partial correlations were conducted to assess associations between the individual students' perceptions of changes in their learning environment and changes in EBP.

Multiple regression was not used because the high number of independent variables would generate problems with multicollinearity. Table II shows results of partial correlations of change scores for learning environment variables with change scores for dependent variables. Results showed that a reduction in "Off-task-orientation" were significantly associated with an increase in all learning environment factors, except "Competition for grades". Change scores for "Meaningfulness of schoolwork", "Teachers` emotional support" and "Adaptation of schoolwork" yielded the strongest coefficients of partial correlations with changes in "Off-task-orientation". Moreover, changes in "Externalising problems" mainly showed somewhat weaker associations with change scores for the learning environment factors. However, a reduction in such problems was significantly associated with an increase in perceived teacher support, as well as an increase in teacher monitoring. It should also be noted, that, apparently in contrast to the pattern of results from pre-post-test comparisons of mean scores, there was a tendency for reduction in externalizing problems to be associated with an increase in perceived student influence.   Finally, a reduction in the scores for "Emotional problems" was significantly associated with an increase in perceived student influence, teacher support and the perceived meaningfulness and adaptation of schoolwork.

Insert Table III about here

Table III shows results of partial correlations of scores of students' coping styles at pre-test with change scores for the dependent variables. Except for a marginally significant

correlation between "Seeking social support" and changes in scores for "Emotional problems", no significant correlations were computed.

Discussion

A restructuring of the learning environment in a Norwegian secondary school was utilized to explore how changes in the learning environment might affect emotional and behavioural problems.

What changes in the learning environment did the students' perceive?

Students' perceptions of the learning environment after the restructuring were generally somewhat more positive than before the restructuring (see table I). However, the only clearly significant change was found for perceived *student influence,* whereas marginally significant improvement in students' perceptions of *teachers' emotional support* and *teachers' monitoring* were found. Moreover, results suggest that restructuring of the learning environment had resulted in greater differences between students in perceived guidance, academic support and monitoring. Greater variations in students' perceptions of guidance may be due to differences in implementation among teachers. However, it is also possible that the intervention, which allowed students to work in different rooms in the school, created a learning environment in which teachers were more likely to overlook some students, or the latter to avoid their teachers' attention.

Was the emotional and behavioural problems affected by the restructuring of the learning environment?

After the restructuring of the learning environment students reported significantly more on-task orientation and marginally significantly less emotional problems. On the other

hand, reports of externalising problems had increased. Taken together with findings for changes in perceived learning environment factors, results seem to support the notion that an increase in student influence, and to a certain degree an increase in emotional support and monitoring, are associated with an increase in student concentration and a more moderate reduction in reports of emotional problems. On the other hand, these results seem to indicate that an improvement in student influence could imply an increased risk of externalising problems among some students. In this way results are in line with the assumption that some students may use or misuse increased autonomy to pursue goals that are in conflict with school norms or learning goals, which may result in increased occurrence of externalising problems. However, it is possible the slight increase in externalising problems could be related to the fact that the restructuring of the learning environment may increases the number of student-student and teacher-student interactions thereby increasing the likelihood that conflicts might arise. Moreover, results seem to indicate that improvement in student influence, combined with an increase in teachers' emotional support and monitoring, have some positive effect on emotional problems.

Associations of within-subject changes in perceptions of learning environment factors with reports of emotional and behavioural problems

The comparison of students' perceptions of LEF and reports of EBP before and after the restructuring of the learning environment suggest that changes in LEF may affect EBP, and thus, do not support that association between LEF and EBP identified by previous research is merely a reflection of individual appraisal and coping styles. To further test this assumption we conducted a within-subject comparison of changes in perceived LEF and reports of EBP. By this approach we aimed at minimizing the influence of individual characteristics.

In line with results for changes in mean scores, results from within-subject comparisons showed that an increase in *student influence* was related to an improvement in reported on-task-orientation. These results are in line with previous research documenting an association between student influence or autonomy and student responsibility, motivation, engagement and concentration (e.g Firestone & Rosenblum 1988; Grolnick & Ryan, 1987; Eccles & Roeser, 1999; Slavin, 1996; Thuen & Bru, 2000; Thuen, Bru, & Ogden, submitted; van Merrienboer & Paas, 2003; Wang & Zollers, 1990). The result is also consistent with the view that students are active participants in their own learning processes, and that the teacher's role is to facilitate students' learning (e.g. Vygotsky, 1978). Interpreted in the light of this, results may well indicate that teachers, in their effort to increase students' on-task-orientation, should encourage students' participation in their own learning by involving them in planning and management of educational tasks.

The significant association between the increment in perceived student influence and reduction in reported emotional problems was also in line with results of changes in mean scores. These findings support the view that perceived student influence may be related to psychological well-being among students. The mechanisms that are believed to affect on-task-orientation may also account for a positive effect concerning emotional problems. Our concern that increased autonomy could imply an increased possibility for students to pursue goals that are in conflict with school norms or learning goals, and that this may result in increased occurrence of externalising problems, was not supported by results from partial correlations, where a non significant but negative association was computed. Accordingly, the present study has led to conflicting results concerning the relationship between student influence and externalising problems. More research is needed to explore this relationship; however, one must be aware of the possibility that increased student influence may be a risk factor for externalising problems among some students.

Changes in *teachers' emotional support* showed a relatively strong correlation with changes in off-task-orientation. Results from the present study are thus in line with previous research (Bru et al., 1998; Connell & Wellborn, 1991; Fraser & Fisher, 1982; Merrett & Wheldall, 1987; Moos, 1979; Murberg & Bru, 2003; Thuen & Bru, 2000; Thuen, Bru, & Ogden, submitted), and indicate that a good relationship between teachers and students promotes student motivation and concentration. Students' perceptions of improvement in emotional support from teachers were also related to reductions in externalising problems and emotional problems, although these correlations were weaker. Results regarding externalising problems support the assumption that emotional support could have a beneficial effect on externalising problems by promoting a sense of belonging and connectedness within the school context (Hawkins & Catelano, 1992; Hirshi, 1969), and previous research relating emotional support with externalising problems (e.g. Murberg & Bru, 2003; Thuen, Bru, & Ogden, submitted). Results indicate that positive relationships between students and teachers may lead to less externalising problems. In the case of emotional problems, the results of partial correlations are consistent with the pattern of changes in mean scores from pre-test to post-test. This lent support to the assumption that caring and supportive relationships contribute to better emotional adjustment among students (Bretherton & Munholland, 1999), and that these relationships promote a learning environment that makes students feel safe and comfortable and which, in turn, seems to be related to lower levels of emotional problems (Murray & Greenberg, 2000; Resnick et al., 1997).

Changes in perceived *teachers' academic support* were also significantly associated with improvements in all dependent variables. This is in accordance with previous research linking academic support to better competence, on-task-orientation, fewer emotional problems and fewer incidents of student misbehaviour (Atwood, 1983; Bru et al., 1998; Evertson & Emmer, 1982; Rutter, Giller, & Hagell, 1998; Thuen & Bru, 2000, Thuen, Bru, & Ogden,

submitted). In this way academic support, giving students the help they need to accomplish tasks, also seems to have a more positive influence on adolescent students' adjustment to school. However, it should be noted that this intervention did not seem produce general improvement in students' perceptions of academic support, but rather increased variations in students' perceptions of academic support.

The adaptation of schoolwork as well as *teacher guidance of students* are conceptually connected to teacher support. Results of partial correlation showed that changes in both adaptation of schoolwork and teacher guidance were associated with lower levels of off-task-orientation. Adaptation of schoolwork was among the strongest predictors of off-task-orientation. This is consistent with previous research documenting the importance of individual adaptation of learning material and instruction to students' needs and interests (Boekarts, 2001; Meece, 2003; Wang & Wahlberg, 1985; Wang & Zollers, 1990). Results suggest that when schoolwork is varied and adapted to students' interests and skills, motivation and engagement are likely to improve, with increased on-task-orientation as a result. Previous research has shown that learning materials that provide an appropriate level of challenge for a given student promote effort, investment and interest in learning (e.g. Eccles & Roeser, 1999). Adaptation of schoolwork, together with individual guidance of students' work and progress, is likely to increase the likelihood of finding the appropriate levels of challenge for each student. Finally, changes in adaptation of schoolwork were marginally significant associated to positive changes in emotional problems, and a non-significant change in externalising problems, while teacher guidance showed non-significant changes in emotional problems and externalising problems. However, there was a tendency for better guidance and adaptation to be related to reduction in these kinds of problems.

In accordance with previous research suggesting that careful monitoring of schoolwork and behaviour seem to prevent or reduce behavioural problems (Doyle & Carter,

1987; Levin & Nolan,1996; Mortimore et al., 1988; Thuen & Bru, 2000; Thuen, Bru, & Ogden, submitted), results from partial correlations showed that students who reported increased levels of *teachers monitoring* also reported positive changes in off-task-orientation and externalising problem. Regarding off-task-orientation, results from partial correlations are in accordance with the pattern of changes in mean scores from pre-test to post-test. On the other hand, this pattern of changes in mean scores showed an increase in teacher monitoring combined with a negative development in externalising problems. It seems probable that this negative development in externalising problems was not induced by the changes in monitoring, but possibly by the stronger increase in student influence. Results also indicate that an increase in monitoring is associated with a decline in emotional problems. This could suggest that good teacher monitoring increases students' sense of security .

Changes in *meaningfulness of schoolwork* yielded the strongest association with off-task-orientation, indicating that the relevance of the schoolwork is an important factor reducing concentration problems in school. This is in line with theories emphasising task value as a main contributor to motivation (Atkinson, 1964; Eccles, 1983), and previous research linking perceived relevance of schoolwork to concentration, increased effort and higher levels of engagement (Cennamo & Braunlich, 1996; Mortimore et al., 1988; Stevenson, 1990; Thuen and Bru, 2000). Improvement in students' perceptions of the meaningfulness of schoolwork was also related to reduction in emotional problems, although this correlation was weaker, suggesting that the enhancement of motivation which meaningful schoolwork seems to contribute, may also reduce emotional problems. The non significant, but negative association between students' perceptions of the meaningfulness of schoolwork and externalising problems lend limited support to the notion that those who find schoolwork of little interest may also perceive school itself as a worthless institution whose norms one should oppose, and as their teachers are representing the system, they may well become the

target of such anti-school feelings. Finally, it should be noted that the restructuring of the learning environment did not produce general improvement in students' perceptions of the meaningfulness of schoolwork, but rather increased variations in students' perceptions of meaningfulness. It is possible that change will be needed to the curriculum in order to achieve a general improvement in students' perceptions of the meaningfulness of schoolwork.

Results of partial correlations showed that students who perceived positive changes in *relations with classmates* also perceived improvement in concentration. This is in line with previous research indicating that close and harmonious relationships with classmates are related to good social and academic adjustment (Damon, 1984; Furman & Gavin, 1989). The result indicates that positive relationships between students seem to promote concentration. Students who perceive that their relations with classmates are positive, probably feel confident that they are well-liked by their classmates and can accordingly focus their energy on their schoolwork. Previous research suggesting that poor relationships with peers at school primarily represent a risk factor for the development of emotional problems (Berndt & Keefe, 1995; Murberg & Bru, 2003; Thuen, Bru, & Ogden, submitted), was not supported by results of the present study. For the last learning environment factor, competition for grades, no significant associations were found. Finally, it should be noted that the restructuring did not produce changes in students' perceptions of relations between classmates or in competition for grades.

Did the intervention work differently for students with different coping styles?

Although the restructuring of the learning environment was designed to improve the adaptation of teaching to the individual student characteristics, we have some reason to believe that key elements of the restructured learning environment may have suited some students better than others, dependent of their coping styles. However, results of partial

correlations between students' report of coping styles at pre-test and scores of change for off-task-orientation, externalizing problems and emotional problems did not support this. It may be that the changes in the learning environment are not great enough to generate differential effects for students with different coping styles. Another explanation for lack of associations between pre-test scores of coping styles and change scores for EBP may be that the increased focus of adaptation to the individual student, may counteract the more structural changes of the intervention.

Methodological considerations

A strength of the present study design is that the possibility for comparing of within-subject changes in students' perceptions of the learning environment with reports of emotional and behavioural problems, minimizes errors due to individual characteristics influencing relationships between independent and dependent variables. The restructuring of the learning environment could also be seen as an experimental manipulation, and gives thus some possibility to test if changes in the learning environment could produce changes in EBP. However, conclusions about causal inferences between variables must be done with caution. One should bear in mind the difficulty of guarding against irrelevant factors contributing to changes in dependent variables, and consequently affecting the study findings. Another threat to internal validity is maturation. An attempt was made to compensate for this by adjusting post-test scores for the general age trend.

Moreover, the study relies on self-report measures, and we cannot rule out that repeated exposures to questionnaires might have affected students' responses in the post-test. One could also question the validity of using student self-report as measures of the learning environment factors. However, previous research indicates that aggregates scores for students' perceptions of LEF correspond well with observational data of learning environment

(De Jong & Westerhof, 2001). Finally, the small sample of 119 students set limitations for use of statistical analyses. A far as external validity is concerned, the fact that the study was undertaken in one single school means that caution must be exercised in generalisation of results across different types of persons and setting.

References

Achenbach, T. M., Dumenci, L., & Rescorla, L.A. (2002). Ten-year comparisons of problems and competencies for national samples of youth: *Self, parent and teacher reports. Journal of Emotional and Behavioral Disorders, 10*,194-203.

Ainsworth, M.D., Blehar, M.C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation.* Hillsdale, NJ: Erlbaum.

Anderman, E. (2002). School Effects on Psychological Outcomes During Adolescence. *Journal of Educational Psychology, 94*, 795-808.

Atkinson, J. W. (1964). *An introduction to motivation.* New York: Van No-strand.

Atwood, R. (1983). *The interacting effects of task form and activity structure on students' task involvement and teacher evaluations.* Paper presented at the annual meeting of the American educational research association, Montreal.

Berndt, T. J., & Keefe, K. (1995). Friends` influence on adolescents` adjustment to school. *Child Development,* 66, 1312-1329.

Boekaerts, M. (2001). Context Sensitivity: Activated Motivational Beliefs, Current Concerns and Emotional Arousal. In S. Volet & S. Jarvela (Eds.), *Motivation in Learning Contexts. Theoretical Advances and Methodological Implications.* New York: Pergamon

Bowlby, J. (1982). *Attachment and loss: Volume 1, attachment* (2nd ed.). New York: basic Books.

Bretherton, I. & Munholland, K.A. (1999). Internal working models in attachment relationships: A construct revisited. In J. Cassidy & P.R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications*. New York: Guildford Press.

Bru, E. (2006). Factors associated with Disruptive Behaviour in the Classroom.

    Scandinavian Journal of Educational Psychology, 50, 23-43

Bru, E., M., Boyesen, M., Munthe, E., & Roland, E. (1998). Perceived Social Support at

    School and Emotional and Musculoskeletal Complaints among Norwegian 8th Grade

    Students*. Scandinavian Journal of Educational Research, 44*, 339-356.

Bru, E., Murberg, T.A., & Stephens, P. (2001). Social support, negative life events and pupil

    misbehaviour among young Norwegian adolescents. *Journal of Adolescence*, *24,* 715-

    727.

Bru, E., Stephens, P., & Martinsen, T. (2002). Students' perceptions of teachers' class

    management styles and their report of misbehaviour. *Journal of School Psychology*,

    40, 287-307.

Byberg, T.K., & Tybring, S.M. (2004). *Læringsmiljø og konsentrasjon blant elever på*

    barnetrinnet (5.,6. og 7.trinn) og ungdomstrinnet. Hovedoppgave i spesialpedagogikk.

    Stavanger: Høgskolen i Stavanger [Learning environment and on-task-orientation

    among Norwegian students from 5th to 10th grade].

Carver, C.S., Scheier, M.F., & Weintraub, J.K. (1989). Assessing Coping Strategies: A

    Theoretically Based Approach. *Journal of Personality and Social Psychology, 2,* 267-

    283.

Cennamo, K., & Braunlich, E. (1996). *The Effects of Meaningfulness of schoolwork on*

    Mental Effort. National Convention of Association for Educational Communications

    and Technology (18 th). Indianapolis, IN.

Chazan, M., Laing, A.F., & Davies, D. (1994). *Emotional and Behavioural Difficulties in*

    Middle Childhood: Identification, Assessment and Intervention in School. London &

    Washington, D.C: The Falmer Press.

Cook, T.D., & Campell, D.T (1979). *Quasi-Experimentation. Design and Analysis Issues for*

Field Setting. Boston: Houghton Mifflin Company.

Collishaw, S., Maughan, B., Goodman, R., & Pickles, A. (2004). Time trends in adolescent

  mental health. *Journal of Child Psychology and psychiatry, 45*, 1350-1362.

Connell, J.P., & Wellborn, J.G. (1991). Competence, autonomy, and relatedness: A

  motivational analysis of self-system processes. In M.R. Gunnar & L.A. Sroufe (Eds.),

  Minnesota symposium on child psychology, Vol. 23. Hillsdale, NJ: Erlbaum.

Corno, L., & Snow, R. E. (1986). Adapting teaching to individual differences among learners.

  In M.C. Wittrock (Ed.), *Handbook of research on teaching 3rd ed.* New York:

  Macmillan.

Costa, P., Somerfield, M.R., & McCrae, R. (1996). Personality and coping: A

  reconceptualization. In N. S. Endler & M. Zeidner (Eds.), *Handbook of coping:*

  Theory, research, applications. Oxford, England: John Wiley & Sons.

Damon, W. (1984). Peer education: The untapped potential. *Journal of Applied*

  Developmental Psychology, 5, 331-343.

Davial, J., Hammen, C., Burge, D., Paley, B., & Daley, S. (1995). Poor interpersonal

  problem solving as a mechanism of stress generation in depression among adolescent

  women. *Journal of Abnormal Psychology, 104,* 592-601.

Deci, E. L., & R. M. Ryan (1992). The initiation and regulation of intrinsically motivated

  learning and achievement. In T. S. Pittman and A. Boggiano (Eds.), *Achievement and*

  motivation. A social-developmental perspective. New York: Cambridge University

  Press.

De Jong, R., & Westerhof, K.J. (2001). The quality of student ratings of teacher

  behaviour. *Learning Environment Research, 4*, 51-85.

Derogatis, L.R., Limpman, R.S., Rickels, K., Uhlenhuth, E.H., & Covi, L. (1974). The

  Hopkins Symtom Checklist: a self report inventory. *Behavioral Science, 19,* 1-5.

Dise-Lewis, J. E. (1988). The Life Events and Coping Inventory: An assessment of stress in

    children. *Psychosomatic Medicine, 50,* 484-499.

Doyle, W., & Carter, K. (1987). How order is achieved in the classroom. In N. Hastings and

    J. Schwieso (Eds.), *New directions in educational psychology, vol 2*. London: Falmer

    Press.

Eccles, J. S. (1983). Expectancies, values, and academic behaviour. In J. T. Spence (Ed.),

    Achievement and achievement motives: Psychological approaches. San Francisco:

    Freeman.

Eccles, J. S., & Roeser, R. W. (1999). School and Community Influences on Human

    Development. In M. H. Bornstein & L. M. E. (Eds.), *Developmental Psychology : an*

    Advanced Textbook (4th ed.) Mahwah, N.J: Lawrence Erlbaum.

Evertson, C. M., & Emmer E. T. (1982). Effective management at the beginning of the year in

    junior high classes. J*ournal of Educational Psychology, 4*, 485-495.

Eysenck, H. J. (1982). *Personality genetics and behavior*. New York: Praeger.

Firestone, W., & Rosenblum, S. (1988). *The alienation and commitment of students and*

    teachers in urban high schools. Washington, DC: Rutgers University and Office of

    Educational Research and Improvement.

Fraser, B. J., & Fisher, D. L. (1982). Predicting students' outcomes from their perceptions of

    classroom psychosocial environment. *American Educational Research Journal, 19,*

    498-518.

Furman, W., & Gavin, L. A. (1989). Peer's influence and adjustment and development: A

    view from intervention. In T. J. Berndt and G. W. Ladd (Eds.), *Peer relationships in*

    child development. New York: Wiley.

Grolnick, W. S., & Ryan, R. M. (1987). Autonomy in children's learning: an experimental and

    individual difference investigation. *Journal of Personality and Social Psychology, 52,*

890-898.

Hawkins, J.D., & Catalano, R.F. (1992). *Communities that care: Action for drug abuse prevention.* San Francisco: Jossey-Bass.

Hirschi, T. (1969). *Causes of delinquency.* Berkeley: University of California Press.

Lamarine, R. (1995). Child and adolescent depression. *Journal of School Health, 65,* 390-394.

Lazarus, R. S., and Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer Publishing Company.

Levin, J., & Nolan, J. (1996). *Principles of classroom management.* Boston: Allyn & Bacon.

Loeber, R. (1990). Disruptive and antisocial behavior in childhood and adolescence: Development and risk factors. In K. Hurrelmann & F. Løsel (Eds.), *Health hazards in adolescence*. Berlin: Walter de Gruyter.

Meece, J. L. (2003). Applying Learner-Centred Principles for Middle School Education. *Theory into Practice, 42,* 109 –116.

McCrae, R., & Costa, P.T (1986) **:** Personality, coping, and coping effectiveness in an adult sample. *Journal of Personality*, *54,* 385-405

Merrett, F., & Wheldall, K. (1987). Natural rates of teacher approval and disapproval in British primary and middle school classrooms. *British Journal of Educational Psychology*, *57,* 95-103.

Moos, R. H. (1979). *Evaluating educational environments.* San Francisco: Jossey-Bass.

Mortimore, P., Sammons, P., Stoll, L., Lewis, D., & Ecob, R. (1988) *School matters: The junior years.* Sommerset, United Kingdom: Open Books.

Murberg, T.A. (2004   ). Social Support, Negative Life Events and Emotional problems among Norwegian Adolescents. *School Psychology International, 25*, 387-404.

Murray, C., & Greenberg, M.T. (2000). Children's Relationship with Teachers and Bonds

with School. An Investigation of Patterns and Correlates in Middle Childhood. *Journal of School Psychology, 38*, 423-445.

Nordahl, T. & Sørlie, M.A. (1998). *Problematferd i skolen. Hovedfunn, forklaringer og pedagogiske implikasjoner*. Oslo, NOVA. Rapport 12a/98.. [*Problem Behaviour in School. Main results, explanations and educational implications; in Norwegian*].

Norusis, M.J. (2000). *Guide to data analysis* . Chicago, IL: Prentice Hall.

Resnick, M.D., Bearman, P.S., Blum, R.M., Bauman, K.E., Harris, K.M., Jones, J., Tabor, J., Beuhring, T., Sieving, R.E., Shew, M., Ireland, M., Bearinger, L.H., & Udry, J.R. (1997). Protecting adolescents from harm: Findings from the National Longitudinal Study of Adolescent Health. *The Journal of American Medical Association*, 278, 823-833.

Rutter, M., & Smith, D.J. (1995). *Psychosocial disorders in young people.* Cambridge: Cambridge Univeristy Press.

Rutter, M.,Giller, H., & Hagell, A.(1998). *Antisocial behaviour by young people*. Cambridge: Cambridge University Press.

Ryan, R.M. & Deci, E.L (2002). Overview of self-determination theory: An organismic dialectical perspective. In E.L. Deci & R.M. Ryan (Eds*.), Handbook of self-determination research.* Rochester, NY: University of Rochester Press. s

Short, R. J., & Shapiro S. K. (1993). Conduct disorders: a framework for understanding and intervention in schools and communities. *School Psychology Review*, 22, 362-375.

Slavin, R.E. (1996). Research on co-operative learning and achievement: What we know, what we need to know. *Contemporary Educational Psychology, 21*, 43-69.

Stevenson, R. B. (1990). Engagement and Cognitive Challenge in Thoughtful Social Studies Classes: A Study of Student Perspectives. *Journal of Curriculum Studies, 4,* 329-341.

Thuen, E. & Bru, E. (2000). Learning environment, meaningfulness of schoolwork and on-task-orientation among Norwegian 9th grade students. *School Psychology International, 21,* 393-413.

Thuen, E. & Bru, E. (2004). Coping styles and emotional and behavioural problems among Norwegian 9th grade students. *Scandinavian Journal of Educational Research, 48,* 493-510.

Thuen, E., Bru, E., & Ogden, T. Students' perceptions of learning environment factors and their reports of emotional and behavioural problems. In what degree do students' coping styles influence this relation? (submitted)

Van Merrienboer, J.J.G., & Paas, F. (2003). Powerful Learning and the Many Faces of Instructional Design: Toward a Framework for the Design of Powerful Learning Environments. In E.D. Corte, L. Verschaffel, N. Entwistle & J. Van Merrienboer (Eds.), *Powerful Learning Environments: Unravelling Basic Components and Dimensions*. New York: Pergamon.

Vitaliano, P.P., Russo, J., Carr, J.E., Maiuro, R., & Becker, J. (1985). The Ways of Coping Checklist: Revision and psychometric properties. *Multivariate Behavioral Research*, *20,* 3-26.

Vygotsky, L.S. (1978). *Mind in Society. The Development of Higher Psychological Processes.* Cambridge: Harvard University Press.

Wang, M.C., & Walberg, H.J. (1985). *Adapting instruction to individual differences.* Berkeley, CA: McCutchan.

Wang, M.C., & Zollers, N.J. (1990). Adaptive instruction: An alternative service delivery approch. *Remedial and Special Education, 11,* 7-21.

Wenzel, K. R. (1989). Adolescent Classroom Goals, Standards for Performance and

Academic Achievement: An Interactionist Perspective. *Journal of Educational Psychology, 4,* 131-142.

West, P., & Sweeting, H: (2003). Fifteen, female and stressed: Changing patterns of psychosocial distress over time. Journal of Child Psychology and Psychiatry*, 44,* 399-411.

Winkley, L. (1996). *Emotional Problems in Children and Young People.* London & New York: Cassell.