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Dissonant study orchestrations of high-achieving university students

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This study focuses on the dissonant study orchestrations of high-achieving university students. Advanced psychology students' dissonant study orchestrations were compared with previous findings of advanced medical students orchestrations. Further, the relation of study orchestrations to study success was examined. The subjects were 28 advanced psychology students at the University of Helsinki, Department of Psychology who returned a task booklet of learning; of these, 24 students completed a questionnaire concentrating on the students' interests, expectations and evaluation of the curriculum. All students were high achievers who had gone through a demanding selection process. The subjects completed three questionnaires concentrating on their study practices, conceptions of knowledge, expectations, and evaluation of the instruction in the Department of Psychology. The results showed that seven out of 28 students expressed a dissonant study orchestration. The results further showed that students' individual study orchestrations were not related to study success. A comparison between advanced medical and psychology students showed that although the profiles of dissonant study orchestrations were technically similar among medical and psychology students, content analyses revealed that reasons for the development of dissonant study orchestrations were different.

Introduction

Recent research has shown that students have personal and individual ways of dealing with their learning environment (e.g., Entwistle, Meyer, & Tait, 1991; Marton & Säljö, 1976; Marton, Hounsell, & Entwistle, 1996; Meyer, 1991; Meyer, Parsons, & Dunne, 1990a,b; Lindblom-Ylänne & Lonka, 1999; Lonka & Lindblom-Ylänne, 1995, 1996; Vermunt, 1996; Vermunt & van Rijswijk, 1988). Some students may seek meaning, relate ideas and be truly interested in the subject they are studying. They are motivated to study and might also experience that the demands of the learning environment support their own individual goals. Some students, on the other hand, may aim at only coping with the learning environment. They may lack objectives, concentrate on memorising facts, and may not be able to pull

together the main ideas of a course or a text. The latter students may be studying in a school-like learning environment which supports these narrow expectations.

These relationships between students' own individual study habits and the demands of the learning environment may be *congruent* (Vermunt & Verloop, 1999), because students' individual learning style and their learning environment support each other. However, some students may develop *dissonant* ways of dealing with the learning environment because of a *friction* (Vermunt, 1996; Vermunt & Verloop, 1999) between their individual learning style and the demands of the learning environment. For example, a student searching for meaning and understanding might end up studying in a learning environment where learning goals are set by the teachers and the curriculum. In contrast, a student who is externally regulated by the demands of the learning environment may be frustrated in a curriculum where students are expected to set their own goals and actively regulate their own learning (Lindblom-Ylänne & Lonka, 1999; Vermunt, 1989).

The concept of *study orchestration* has proved to be a functional one in examining university students' combinations of approaches or orientations in relation to the learning environment (e.g., Lonka & Lindblom-Ylänne, 1995; Lindblom-Ylänne & Lonka, 1999). It reflects well the complexity of the phenomenon. Meyer (1991, p. 297) defines the concept of study orchestration as a 'contextualized study approach adopted by individual students or groups of students'. This concept recognises three important aspects of student learning: the existence of qualitative individual differences in the manner in which students approach and engage in learning tasks, the influence of context on such engagement, and differing conceptions of learning among individual students (Meyer, 1991). Recent research further indicates that student learning reflects the interaction between the learner and the learning environment (Lonka & Lindblom-Ylänne, 1995; Ramsden, 1988). Therefore, an orchestration does not develop in a vacuum but rather reflects the functionality of the learning environment from the learner's perspective.

Study orchestrations and different learning environments

We have examined and compared students studying in two different kinds of learning environments (Lonka & Lindblom-Ylänne, 1995, 1996). A traditional medical curriculum and an activating psychology curriculum may be considered opposites of each other. That is, the traditional medical curriculum has been school-like and emphasised the acquisition of facts rather than clinical competence. Medical students were good at book-learning, but their training did not enhance the formation of clinical skills and situational learning (Lindblom-Ylänne, Lonka, & Leskinen, 1996, 1998). The psychology curriculum, on the other hand, was reformed to support the principles of activating instruction: 1) Diagnosing and activating previous knowledge, 2) Fostering the learning process and reflective thinking, and 3) Giving feedback and challenging misconceptions (Lonka & Ahola, 1995).

Different learning environments seem to lead to the development of different kinds of study orchestrations. Our previous research shows that at the beginning of university studies medical and psychology students' study orchestrations were very similar, but that after five years of studying in different learning environments, traditional and activating, the orchestrations developed in separate ways: most typical of advanced medical students was a reproducing orchestration, whereas a meaning orchestration was most typical of advanced psychology students (Lonka & Lindblom-Ylänne, 1995).

Individual study orchestrations of advanced medical students

Our previous study (Lonka & Lindblom-Ylänne, 1995) concentrated on analysing different orchestrations at the group level. However, as Meyer *et al.* (1990b) emphasise, the unit of analysis should be the individual, because the characteristics of a group do not necessarily adequately represent or capture the range of individual characteristics of those individuals who constitute it. Therefore, our next study (Lindblom-Ylänne & Lonka, 1999)

concentrated on advanced medical students' individual study orchestrations and their relations to study success.

We were especially interested in medical students' *dissonant study orchestrations*. Meyer defines the concept of *dissonant orchestration* as unexpected and uninterpretable linkages between approaches to learning and perceptions of the learning environment (Meyer et al., 1990b). Unlike Meyer's research, our studies have concentrated on high-achieving university students. Eight out of 67 students were analysed as expressing a dissonant study orchestration. Typical of medical students with dissonant study orchestrations was a process of change in their study practices. These students seemed to possess the metacognitive skills to evaluate their learning practices, unlike those medical students expressing a coherent reproducing orchestration who, in turn, admitted that they should develop more effective learning strategies, but did not know how to.

We interpreted this process of change to be due to the traditional learning environment in the medical school which had forced students to study in a way that was not typical of them. Further, we argued that the difference between the demands of the learning environment and students' own personal goals, in this case *destructive friction* (Vermunt & Verloop, 1999), may lead to the development of a dissonant study orchestration. It seemed that the traditional curriculum was not the best environment for these medical students. However, they were all quite sure about the purpose of studying: they wanted to become competent physicians, but their view of an optimum learning environment differed from that of the Faculty.

The aim of the present study is to examine what kind of dissonant study orchestrations can be found among high achieving psychology students. The purpose is to compare advanced psychology students' individual study orchestrations to those of advanced medical students reported in our previous study (Lindblom-Ylänne & Lonka, 1999). Further, the relationship of study orchestrations to study success will be examined as in the previous study. The role of the environment in the development of dissonant study orchestrations is of particular interest in the present study. Our previous study (Lindblom-Ylänne & Lonka, 1999) showed that medical students studying in a traditional school-like curriculum seemed to develop dissonant study orchestrations because of the conflict between the demands of the learning environment and students' personal goals. Psychology students' learning environment, however, is more activating and emphasises more self-regulation than that of medical students. It will be interesting to examine how these different learning environments are reflected in the development of dissonant study orchestrations. Of further interest is the relationship between regulation activities and dissonant study orchestrations. Meyer (1996) has associated dissonant study orchestration with external causal attribution for academic success. This indicates that students expressing a dissonant orchestration may lack abilities to regulate their learning activities. Our previous study (Lindblom-Ylänne & Lonka, 1999) indicated that the experienced conflict between students' own goals and those of their learning environment somehow broke down the regulation activities that students were used to. Despite these students' ability to use metacognitive regulation activities, they were unable to regulate their studies. It seemed that as their studies proceeded these students were no longer sure who was responsible for the regulation of their studies: themselves as self-regulated learners or the curriculum teachers as external regulators. This implies that high-achieving medical students expressing a dissonant orchestration may not lack regulation abilities. Instead, the externally regulated learning environment forces students to change their study practices towards more externally regulated learning style, a process which seem to lead to a development of a dissonant orchestration.

Method

Subjects

The subjects were 28 advanced psychology students at the University of Helsinki who returned a *task booklet of learning*, the return percentage being 63%. There were 23 female

and 5 male students in the group. In addition, students were sent a questionnaire at the end of their fifth year of studies concentrating on their experiences, expectations and evaluations of psychology studies. 24 out of 28 students returned this questionnaire. Of these, 19 were female and 5 male.

Materials

A task booklet of learning. The students had described their modes of studying by responding to Likert-type statements, presented to them in a task booklet of learning after five years of studying. Students rated a set of 71 statements concerning their learning approach, and their regulation and conceptions of learning on a five-point scale. The scales, taken from Entwistle and Ramsden (1983), were Surface approach, Deep approach and Achievement motivation. Scales measuring regulation activities (Self-regulation and External regulation in learning, as well as Lack of regulation), and conceptions of learning, education and cooperation (Intake of knowledge, Construction of knowledge, Use of knowledge, Stimulating education, Cooperation) were adopted from Vermunt and van Rijswijk (1988). Perry's (1968) Dualism scale was also embedded in the inventory, as in Ryan (1984). The scales used in the task booklet of learning are reported in more detail in Lonka and Lindblom-Ylänne (1996).

Expectations of psychology studies and evaluation of the curriculum. In addition to the task booklet of learning, the students were sent a questionnaire after five years of studying. The questionnaire consisted of both structured and open-ended questions, where students were asked about their interests, plans, and study habits and to evaluate the programme and instruction in general. The questionnaire consisted of the following themes: 1) Strong and weak instructional aspects, 2) Expectations towards psychology studies and their realisation, 3) Subdomains and jobs of interest, 4) Possibilities for full-time studying, 5) Writing activities related to studies, 6) Evaluation of own development in different subdomains, and 7) The relationship between theory and practice in psychology studies. The questionnaire and the results are reported in more detail in Lonka and Ahola (1995). Content analyses of the main themes of the questionnaire, in which students gave open-ended answers, were carried out.

Two aspects of academic achievement were scored: 1) *grades* from psychology courses and 2) study *pace* measured by mean number of credit units completed where one credit unit refers to an average of 40 hours of study. The grading scale for each course was as follows (from the highest grade): (3) 'excellent', (2) 'good', (1) 'satisfactory', and (0) 'fail'.

Statistical procedures

Our previous study on advanced medical students' individual study orchestrations (Lindblom-Ylänne & Lonka, 1999) was based on a k-means cluster analysis. In order to be able to compare advanced psychology and medical students' individual study orchestrations, particularly dissonant study orchestrations, we decided to use the same analysis for the present study despite the sample size. It must be noted, therefore, that the statistical analyses are exploratory. Independent samples t-tests were used in order to compare two cluster groups with each other. SPSS 7.5 for Windows was used in the analyses.

Results

Interpretation of the two-cluster solution

Because of the sample size limitation the analysis was limited to a two-cluster solution. Cluster 1 (n=12) was entitled *Meaning-oriented independent students.* These students scored

highly on Deep approach, Self-regulation, and Achievement motivation. However, they had low scores on Cooperation, which was interpreted to mean that they preferred to work independently, rather than in cooperation with others. This cluster resembles very closely a *meaning orchestration* (Lonka & Lindblom-Ylänne, 1995) in which students scored above average on meaning-directed, and below average on reproduction-directed, orientation. Therefore, Cluster 1 will be hereafter called the *meaning orchestration*. Cluster 2 (n=16) was entitled *Reproduction-oriented and externally regulated students*. These students scored highly on Lack of regulation, Surface approach and Intake of knowledge. The fact that they also had high scores on Cooperation indicates that they were more likely to depend on other students than to be truly co-operative. Cluster 2 is almost identical with the *reproducing orchestration* (Lonka & Lindblom-Ylänne, 1995) in which students scored above average on reproduction-directed and below average on meaning-directed orientation. Therefore, this cluster will hereafter be called *reproducing orchestration*.

Table 1

Significance testing of means of individual scales by cluster

	Cluster 1 (n=12)	Cluster 2 (n=16)	
Scale	*M*	*M*	F
Achievement Motivation	3,50	2,63	7,53*
Construction of Knowledge	4,48	4,33	0,44
Cooperation	1,65	2,58	8,71**
Deep Approach	4,26	3,39	15,52***
External Regulation	1,93	2,29	4,23*
Intake of Knowledge	2,25	2,84	7,04*
Lack of Regulation	1,35	2,24	19,01***
Dualism scale (Perry)	2,01	2,33	2,26
Self Regulation	3,35	1,90	44,21***
Stimulating Education	3,43	3,91	2,75
Surface Approach	1,99	2,61	9,24**
Use of Knowledge	4,02	4,28	0,96

Note. * p<0.05, ** p<0.01, *** p<0.001. Maximum score per scale is 5.

Table 1 shows the significance testing of the means of the individual scales by cluster. The means of the scales in the two clusters differed significantly, except the means of Construction of knowledge, Perry's Dualism scale, Stimulating education and Use of knowledge.

Independent samples T-tests showed that there were not significant differences between the two cluster groups in terms of academic achievement, that is, grades and pace of studying. Students who belonged to the *meaning orchestration* cluster achieved slightly higher grades (M=2.25, SD=0.23) than students who belonged to the *reproducing orchestration* cluster (M=2.13, SD=0.33, t(24)=1.10, p=0.29). Further, in the *meaning orchestration* cluster, students' study pace was approximately ten percent faster measured by the mean number of credit units (M=159, SD=35.78) than in the *reproducing orchestration* cluster (M=144, SD=52.51, t(24)=0.89, p=0.38).

A qualitative analysis of students' dissonant study orchestrations

All psychology students' individual study orchestrations were analysed in detail. The qualitative analyses of the questionnaire data of all students are presented in Table 2. All students (n=12) who belonged to the *meaning orchestration* cluster were analysed as expressing a coherent meaning orchestration. No dissonant orchestrations was found. There

were 9 female and 3 male students in this group. Questionnaires were returned by 9 students, of these 6 were female and 3 male. Students' open-ended answers showed that they were highly motivated in their psychology studies. Nearly all of them had been able to concentrate on full-time studying even though more than half of them had worked part-time, one student even full-time. Further, these students emphasised their own active role in and responsibility for their own learning. Student 7 is a typical representative of Cluster 1:

> I believe in my own initiative in studying. I'll get a broad picture of psychology if I am motivated in my studies; probably curriculum studies are not enough... In my opinion theory and practice is well balanced in the curriculum – it would be too easy to outweight theory with practice. (25-year-old male, meaning orchestration)

Student 17 describes his expectations towards psychology studies in a typical way for students expressing a meaning orchestration:

> It is amazing that it is possible to pass most of the courses only by memorising without understanding. I expect my thinking skills to become more sophisticated during my studies. This will not happen because of the curriculum but because of myself, my own activity. (23-year-old male, meaning orchestration)

Student 21 expresses a strong self-regulation in learning and writes about the qualification she is expecting the curriculum to provide her in the following way:

> I'm not expecting to really learning anything except through my own hard work. My own interest and initiative are the most important things. It is important to learn how to find and choose information. (24-year-old female, meaning orchestration)

There were 14 female and 2 male students who belonged to the second *reproducing orchestration* cluster. This cluster was divided into two subgroups on the basis of the coherence of these students' orchestrations. Those students who expressed a 'purely' reproducing orchestration, that is, those whose orchestrations were theoretically logical and contained no atypical patterns of loadings on the scale scores formed a coherent subgroup of 9 students of which 8 were female and 1 male. In this subgroup, all expect one female returned the questionnaires. These students' answers showed that almost all students were at least moderately motivated in their studies. Three students had occasionally lacked motivation. Half of the students had experienced hindrances to full-time studying. Students belonging to this subgroup expected to obtain good basic knowledge and skills during their studies but many believed that more profound knowledge and advanced skills as well as qualifications would develop through practice, that is, not during but *after* their studies.

Student 5 has a typical attitude towards studying for this subgroup:

> My attitude towards psychology studies is 'Let see what happens'. My belief in the value of psychology has suffered. Maybe that's why my attitude is passive. However, I believe that this is a right place for me. Probably I'll choose a topic for my thesis from general psychology. Applied psychology interests me more, but I have been told that writing a thesis is easier if your topic is from general psychology. (24-year-old female, reproducing orchestration)

Student 19 describes her expectations towards psychology studies in a way that is characteristic of students expressing a coherent reproducing orchestration:

> I expect to obtain basic qualifications from a broad domain during my studies, but not 'specialisation', which takes place in working life. I haven't been able to study at full capacity because of a part-time job and temporary lack of motivation, but I'll try to keep an almost full-time study pace. (29-year-old female, reproducing orchestration)

Table 2

Qualitative analyses of questionnaire data (n=24)

	Qualitative analyses					
Technical cluster profile	Expectations	Hindering factors	Experienced hindrances	Theory vs. practice	Motivational status	Implicit level of satisfaction
CLUSTER 1 *'Meaning-oriented independent students'*						
Coherent profiles (n=9)						
Student 2 (female, 33 years)	Methodological courses	part-time job Independent studying	none	balanced	high	high
Student 7 (male, 25 years)	Believe in own initiative	none	none	balanced	high	high
Student 10 (female, 27 years)	Independent studying	part-time job More courses on research	some	balanced	high	high
Student 15 (female, 23 years)	More theoretical knowledge	none and practical skills	none	balanced	high	high
Student 16 (female, 23 years)	Desire to study also other	other studies subjects	none	slightly too	neutral	neutral theoretical
Student 17 (male, 23 years)	Sophisticated thinking skills	military Importance of own activity Understanding is essential	none service	balanced	high	high
Student 21 (female, 24 years) activity and interest Did not expect such a surface-oriented curriculum	Qualifications through own other studies	part-time job,	none	balanced	high	low
Student 25 (male, 23 years)	Broad picture of psychology	military service Application of knowledge	some part-time job	balanced	high	high
Student 28 (female, 34 years)	Knowledge and skills for	full-time job research	none	too theoretical	high	high
No dissonant profiles						
CLUSTER 2 *'Reproduction-oriented and externally regulated students'*						
Coherent profiles (n=8)						
Student 1 (male, 31 years)	Not such a change	children,	some	balanced	neutral	neutral
Student 5 (female, 24 years)	Own attitude is passive Good qualifications	none	none	too theoretical	neutral	neutral
Student 6 (female, 25 years)	Did not expect such a	none theoretical approach	none	too theoretical	neutral	neutral

cont. →

Table 2 (cont.)

	Qualitative analyses					
Technical cluster profile	Expectations	Hindering factors	Experienced hindrances	Theory vs. practice	Motivational status	Implicit level of satisfaction
Student 13 (female, 32 years)	Basic knowledge, not skills	part-time job Did not expect such a fragmented curriculum Did not expect such an attitude towards students	some	too theoretical	neutral	low
Student 14 (female, 27 years)	Good knowledge and skills,	part-time job self-confidence	none	difficult to say	high	high
Student 19 (female, 29 years)	Basic qualifications from a broad domain, not special knowledge	part-time job, temporary lack of motivation	some	balanced	neutral	high
Student 23 (female, 26 years)	Concrete aids for practice	social activities Basic qualifications	some	too theoretical	neutral	neutral
Student 26 (female, 24 years)	A lot of knowledge from different domains and some qualifications for profession	lack of motivation	none	balanced	neutral	neutral
Dissonant profiles (n=7)						
Student 3 (male, 25 years)	To pass courses	lack of motivation Don't expect to acquire skills/ knowledge for practice	some	too practical	neutral	neutral
Student 4 (female, 23 years)	To get critical thinking skills	none Don't expect to acquire enough skills/ knowledge for practice	none	too theoretical	neutral	neutral
Student 9 (female, 25 years)	Good knowledge for practice	part-time job,	a lot	balanced lack of motivation	neutral	neutral
Student 11 (female, 24 years)	Don't expect to get enough	part-time job, knowledge for practice	some lack of motivation	too theoretical	neutral	low
Student 12 (female, 24 years)	How to search for information	part-time job, Wish to form a synthesis of fragmented knowledge	some other studies	too theoretical	neutral	neutral
Student 20 (female, 25 years)	Sound theoretical base, not practical skills	lack of motivation	a lot	balanced	low	low
Student 27 (female, 26 years)	Knowledge for practice	none Knowledge for future use	none	too theoretical	neutral	neutral

Student 23 agrees with Student 19 and writes in a following way:

> I expect my advanced studies to provide me with concrete practice for working life. However, I don't believe good qualifications are everything – the real skill develops from experience. In working life I have to pray that I won't make serious mistakes. (26-year-old female, reproducing orchestration)

The second subgroup within the reproducing cluster consisted of 7 students, 6 female and 1 male, who were analysed as expressing a dissonant study orchestration. These students had a profile which contained atypical patterns of scale scores. The most typical combination of scales among these students was high scores on Deep approach and low scores on Self-regulation. Five students had this kind of combination, but together with 10 remaining scales every student had an individual dissonant study orchestration which was slightly different from each other students'.

All seven students returned the questionnaires. These students' answers to the questionnaires also had much in common: only two students had not experienced any hindrances in studying. The other 5 students had not been able to study full-time, not only because of part-time jobs, but more importantly because of a lack of motivation or concentration. Five considered psychology studies to be too theoretical in nature. Three students felt that teachers expect them to have profound general knowledge about the domain of psychology and also to study more independently than the students thought they were capable of.

Student 9 is a typical example of dissonant study orchestration among psychology students. She scored highly on Deep approach, External regulation and Perry's Dualism scale and low on Self-regulation. She has a part-time job and sometimes lacks study motivation. She finds it difficult to fulfil teachers expectations about students' self-regulation in their studies and writes in the following way:

> New for me has been an extreme critical approach. Students are responsible for their own learning; we must use our own judgement... Studying psychology is very independent, which is a strong aspect in the instruction. On the other hand, in some courses teachers expect students to study fully independently and to have, before the course has even started, knowledge and skills required to perform a task. Sometimes I have felt that teachers look at me disparagingly, because I don't know how to act. I find this inconceivable, because no one should expect that we know everything before we attend a course. (25-year-old female, dissonant study orchestration)

Student 20 also represents also a typical dissonant study orchestration. She scored highly on Deep approach and External regulation and low on Surface approach, Self-regulation and Lack of regulation. She had studied mainly full-time, but interrupted her studies temporarily because of a lack of motivation and concentration. She agrees with Student 9 that teachers' expectations are very high and that courses concentrate too much on theoretical aspects.

> Sometimes I feel that the same general knowledge is taught in different courses; there is overlap among courses. Sometimes teachers expect us to have too profound a basic knowledge about a domain. It is good that I'm able to read at my own pace... Some teachers don't respect students' opinions at all. However, sometimes a teacher presents a challenging question during the course, but at the end of the course I notice that I haven't got any answers to those questions. This kind of teaching is very frustrating. (25-year-old female, dissonant study orchestration)

Student 11 had low scores on Deep and Surface approach as well as on Self and External regulation and high scores on Lack of regulation, Cooperation and Intake of knowledge. She also has a part-time job and lacks motivation in studies. In her opinion, psychology studies are too theoretical in nature:

> I have worked from the beginning of my studies and from time to time I find it difficult to motivate myself to read... Of course we need theory and research, but because only a fraction of us will end up as researchers, the curriculum should be better balanced towards clinical knowledge and skills... Clinical psychology courses have been too theoretically oriented. (25-year-old female, dissonant study orchestration)

An interesting exception among the seven students was Student 3. He was the only male student in this dissonant orchestration subgroup. He obtained high scores on both Deep and Surface approach and on Lack of regulation and Cooperation but low scores on Self and External regulation. He had also suffered from a lack of motivation in his psychology studies. He complained about a too light a theoretical approach in the following way:

> I expect from my psychology studies... answers to theoretical questions... Theory formation is poor in psychology. Teachers often teach us outdated knowledge. Studying psychology is much easier than I thought. (26-year-old male, dissonant study orchestration)

Taken together, students expressing a coherent meaning orchestration were the most motivated towards and the most satisfied about their studies in the Department of Psychology, when compared to students expressing a coherent reproducing orchestration or a dissonant orchestration. The former group of students emphasised most often the importance of theoretical thinking and understanding as well as students' own initiative in studying. Students expressing a coherent reproducing orchestration, on the other hand, expected basic knowledge and basic qualifications for practice from their psychology studies. Their motivational status and level of satisfaction were neutral. Finally, students expressing a dissonant orchestration seemed at least reasonably satisfied with their studies at the Department of Psychology even though they all found some aspects to criticise in the instruction and curriculum. Further, despite the lack of motivation, 6 out of 7 continued their studies and planned to graduate. Student 20 was the only student who dropped out, though she was probably going to continue her studies after a half-year break.

Discussion

Problems with regulation activities in learning have been shown to be related to dissonant study orchestrations (Meyer, 1996; Lindblom-Ylänne & Lonka, 1999). Previous research has related self-regulation to the deep approach, whereas external regulation has been linked to the surface approach (Beishuizen, Stoutjesdijk, & van Putten, 1994; Lonka & Lindblom-Ylänne, 1996; Vermunt & van Rijswijk, 1988). According to Beishuizen et al. (1994), other combinations, especially the combination of self-regulation and the surface approach, may result in poor learning outcomes. The problematic combinations, such as self-regulation and the surface approach, or external regulation and the deep approach, may be interpreted as expressions of dissonant study orchestrations. The present study also showed that dissonant orchestration was related to regulation in studying, particularly to the inability to self-regulate.

Previous research has shown that study orchestrations are related to study success across different domains (Entwistle et al., 1991; Lindblom-Ylänne & Lonka, 1999; Lonka & Lindblom-Ylänne, 1995; Meyer et al., 1990a,b). Our previous research showed that meaning orchestrations that were least typical in medical students were related to study success in this domain (Lindblom-Ylänne & Lonka, 1999; Lonka & Lindblom-Ylänne, 1995). However, our research (Lonka & Lindblom-Ylänne, 1995) further revealed that among psychology students, there were no significant differences in grades in terms of orchestrations. This study confirms our previous findings that psychology students' study orchestrations were not related to study success. In our previous study we concluded that the reasons for this may be partly technical: there were not as many subjects as in medicine, and there was less variance among

psychology students conceptions of learning and knowledge than there was in medicine. In general, sophisticated conceptions of learning and knowledge were much more typical in psychology than in medicine. The sample size was smaller in the present study than in our previous study, which may explain, at least partly, that study orchestration did not have a significant statistical association with academic achievement.

However, it is puzzling that there were students who expressed a dissonant study orchestration in Cluster *Reproduction-oriented and externally regulated students* among both medical and psychology students, but that only in medicine were these students' grades significantly lower than other students' grades. It seems that the formation of a dissonant study orchestration is much more severe in medicine than in psychology because it reflects a conflict between the requirements of the learning environment and the students' individual study practices. Boekaerts (1997) has pointed out that the goals set by teachers and the curriculum may not be congruent with those generated and defined by the students. Psychology students expressing dissonant orchestrations do not exhibit this kind of friction. These students seem to understand that demands of self-regulation in learning are relevant for their future studies and profession even though they may feel at the moment that teachers should support them more. Further, our research indicates that students with sophisticated study practices may not be ready to give up their own study practices because they strongly feel that their own way of studying fosters their growth into competent professionals (Lindblom-Ylänne & Lonka, 1999). This gives rise to the conflict between the curriculum and a student, because neither will change.

The difference between medical and psychology students is probably due to different curricula: medical and psychology curricula may be considered opposites. In psychology, the structure of the whole curriculum and also the outcome measures were redesigned in cooperation with the students in 1985, and teachers were trained to apply activating instruction (Lonka & Ahola, 1995). In medicine, the curriculum as well as the outcome measures have been quite traditional until recent years. In autumn 1998 the Faculty of Medicine will start applying a problem-based curriculum, which means an important change towards self-regulated and active learning.

Further, compared to medical students with a dissonant study orchestration, psychology students analysed as expressing a dissonant orchestration did not depict as low a level of study satisfaction as did medical students in our previous study (Lindblom-Ylänne & Lonka, 1999). Although psychology students were complaining about different aspects of the instruction and curriculum, they seemed quite satisfied with their curriculum, teachers and their learning environment. The mismatch between the demands of the learning environment and their personal goals was not as contradictory as among medical students. This difference between medical and psychology students further reflects the different learning environments and is in line with the previous research of Lonka and Ahola (1995), who have shown that students studying in different curricula perceived their learning environments differently: those students who studied in an activating curriculum were significantly more pleased with the instruction than students in the traditional curriculum.

Psychology students were quite ready to express lack of motivation in studying. According to Entwistle et al. (1991), students with disintegrated perceptions of their learning environment and approaches to studying seem to lack a commitment to their academic environment. It may be possible that the psychology curriculum, which is 'loose' and emphasises students' responsibility for their own learning, induces more easily a lack of motivation than a school-like traditional medical curriculum in which students' study pace and the order of the courses are fixed.

However it is very difficult to say, which comes first: lack of motivation or dissonant study orchestration. Does a student's consciousness about the mismatch between own study practices and goals and the demands of the curriculum lead to a lack of motivation, or does the lack of motivation lead to the development of a dissonant study orchestration?

Technically, advanced medical and psychology students' dissonant study orchestrations resemble each other, but reasons for the development of dissonant profiles vary: medical

students expressing dissonant orchestrations had all noticed a change in their study habits (Lindblom-Ylänne & Lonka, 1999). We interpreted this change to take place because the traditional medical curriculum forces these students to study in a way which is not typical for them. Psychology students, on the other hand, found the demands of the learning environment difficult because of the emphasis on self-regulation in studies. The change in study habits also seems to be related to psychology students' dissonant orchestrations, because the psychology curriculum guides the students towards effective and high-quality study practices unlike the traditional medical curriculum, which forces students towards reproduction-oriented and externally regulated learning without fostering students' growth into competence. Thus, psychology students are satisfied with their demanding learning environment because they understand that it gives them good qualifications for their future profession.

It is extremely important that the learning environment supports and guides students towards qualitatively effective learning. The present study has shown that the activating curriculum supporting self-regulation in learning does not cause as severe mismatches with the learning environment as does the traditional curriculum. According to Vermunt (1996), it would be important to discourage a reproduction-directed orientation and encourage a meaning-directed orientation, because the latter appears to be the most consistent with the goals of higher education including the ability to think, to make decisions and to learn independently. Psychology students expressing a dissonant orchestration may experience a *constructive friction* between their learning style and the demands of the learning environment, because their learning environment probably supports the development of their learning style towards more sophisticated, that is, more self-regulated and more meaning directed learning. Medical students expressing a dissonant orchestration, on the other hand, may experience a *destructive friction* between their learning style and demands of the learning environment, because their learning environment forces these students to study more superficially than they would normally do.

Thus, the impact of the learning environment on the development of students' study orchestrations seems to be crucial. Consequently, more attention should be paid to the congruence between teaching and learning strategies (Vermunt & Verloop, 1999) and also to the principles on which curricula are designed. Learning environments should be designed to support the development of learning styles from external towards internal regulation (Vermunt & Verloop, 1999). The problem which should be addressed is that the curriculum demands do not always support the students' growth into competence.

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L'étude est centrée sur les dissonantes 'orchestrations de leurs études' par de bons étudiants d'Université. Les auteurs comparent les 'orchestrations dissonantes' d'étudiants avancés en psychologie à des résultats antérieurs d'étudiants avancés en médecine. Ils examinent ensuite les relations entre 'orchestration des études' et réussite dans les études. L'étude a porté sur 28 étudiants de psychologie avancés du département de psychologie de l'Université d'Helsinki ayant rempli un livret concernant leur approche de l'apprentissage, leur régulation et leurs conceptions de l'apprentissage. Parmi eux, 24 étudiants ont rempli un questionnaire concernant leurs intérêts, leurs expectations et l'évaluation de leur curriculum. Tous les étudiants étaient de très bons étudiants ayant été soumis à un processus sévère de sélection. Les sujets ont rempli trois questionnaires concernant leurs pratiques d'études, leurs conceptions de la connaissance, leurs expectations et l'évaluation de leur formation dans le département de psychologie. Les résultats montrent que 7 des 28 étudiants expriment une orchestration

dissonante de leurs études. Les résultats montrent également que l'orchestration des études n'est pas liée à la réussite. La comparaison entre les étudiants avancés de médecine et de psychologie montre que les profils d'orchestration sont techniquement similaires chez les deux catégories d'étudiants. En dépit de cette similarité, les analyses de contenu révèlent cependant que les raisons du développement de l'orchestration des dissonances dans les études sont différentes.

Key words: Academic achievement, Learning environment, Study orchestrations, University students.

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Current theme of research:

Educational psychology, assessment orientations to studying.

Most relevant publications in the field of Psychology of Education:

Lindblom-Ylänne, S., & Lonka, K. (1999). Individual ways of interacting with the learning environment. *Learning and Instruction, 9*, 1-18.

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