

Well aren't you Cue-Conscious

Cue-Profiles: Old Learning Approaches Revisited

Bachelorthesis

Group 42

Author:

Anthea Aerts – 3627810

Utrecht University – Liberal Arts and Sciences: Educational Sciences

Supervisor:

Frans Prins

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ABSTRACT

Miller and Parlett (1974) once defined three learning approaches based on the way students listened to cues given by teacher about examination and how they used these cues as guidelines for their learning. Nowadays, these cue-profiles have disappeared and the deep learning approach, surface approach and the strategic approach have taken their place (Ramsden, 1979). However, information about the learning environment is missing in these new learning approaches (Parpala et al, 2010). On top of this, a paradox arises. The paradox of clearly stating the criteria and standards and the students focussing on the superficial aspects of learning instead of engaging in meaningful learning (Norton, 2004). This study will contribute to these discussions about the paradox and the learning environment by defining the cue-profiles anew and creating a new instrument, the Cue-Profile Questionnaire (CPQ), to assess the cue-profiles with recent information on learning approaches. This questionnaire assesses multiple scales like motivation to achieve, metacognition and curriculum. The results of the questionnaire are supported with three qualitative interviews.

Keywords: cue-profiles, learning approach, learning environment, criteria, CPQ

Introduction

According to Gibbs and Simpson (2004) the way students study is influenced by the way they are assessed, instead of the way they are taught. They underline this statement by referring to a research done by Miller and Parlett at Edinburgh University (1974). In this research, Miller and Parlett found three ways of how students approached their studies. These three approaches, the *cue-profiles*, were based on the extent to which students used their learning environment to their benefit. However, Ramsden (1979) suggested in his research that the three learning approaches from Miller and Parlett (1974) would be more applicable in further research when redefined as a “strategic” learning approach, because Ramsden concluded from his research that the three approaches that Miller and Parlett had found, were too context specific.

Recent literature still reports of a “strategic” learning approach, but the definition has been generalised to how students organise their learning and aim to do well in assessment (Parpala et al., 2010; Reid et al, 2012). In this new definition, the learning environment and how the learning environment can influence students’ learning is completely left out. This

learning environment is of importance, because it is proven to be an undeniable part of learning approaches (Wierstra et al., 2003; Jungert & Rosander, 2009 and Parpala et al., 2010). In the current study an attempt is made to include the learning environment again, by making a questionnaire, the Cue-Profile Questionnaire (CPQ), to assess the three cue-profiles found by Miller and Parlett (1974) with the knowledge of today's research on learning approaches and the learning environment.

Miller and Parlett found the cue-profiles by accident (1974). They noticed a difference between students when interviewing them about how they approached their teachers and if they had a certain technique when they had to learn for their examinations. Because their findings were accidental and further research on learning approaches took another turn, the three cue-profiles from Miller and Parlett (1974) will be redefined in this study. Moreover, recent research on learning approaches demonstrates that a learning approach is not a single construct that can be measured, but that multiple dimensions combined explain a student's approach to learning (Entwistle et al., 1979; Biggs et al., 2001; Jungert & Rosander, 2009 and Parpala et al., 2010). It is assumed that the cue-profiles from Miller and Parlett (1974) have underlying dimensions as well and these will be defined in the following paragraphs.

This study contributes to the many literature written about learning approaches. By creating an instrument for the cue-profiles, a new scope can be opened up, where both the learning environment and the learning approaches can be assessed. The outcomes of the CPQ may be used in academic context and can provide as feedback for the teachers.

The outcomes of the CPQ can also contribute to the paradox that Norton (2004) describes in her research. Norton (2004) found that when assessment criteria are explicitly stated, this paradoxically leads to students taking on a strategic approach. She argues that this is detrimental for learning, because instead of "engaging in meaningful learning activity" the students are more likely to focus on "superficial aspects" of their assessment tasks (Norton, 2004). The cue-profiles involve the use of the learning environment and the learning criteria with which students who are more likely to focus on the superficial aspects of their assessment tasks can be identified as well.

It is expected that the three cue-profiles from Miller and Parlett (1974) can be found with the CPQ, which assesses multiple underlying dimensions, based on recent literature on learning approaches. This would mean that one group of students would score high on most dimensions, the so-called *cue-seeking* students, one group would score low on most dimensions, named *cue-deaf* students, and one group would score average on most dimensions assessed in the CPQ, the *cue-conscious* students. It is also expected that interviews with three students from

the three different groups, will support the results of the CPQ and the expectation that the three ways of approaching learning is strongly related to how and if students 'use' (aspects of) the learning environment.

The following paragraphs will further elaborate on learning approaches in general and the research of Miller and Parlett (1974), what learning approaches they found and what these cue-profiles entail. The learning environment and the underlying dimensions will also be defined and related to the learning approaches. This research was conducted to answer the following research question: "To what extent can the cue-profiles be measured in a questionnaire as an integrated construct with the underlying dimensions of *motivation to achieve, metacognition, cues, curriculum and attitude*?" In conclusion of this study, the results of the questionnaire and the interviews will be analysed, described and discussed.

Theoretical Framework

Learning approaches

The cue-profiles were defined based on how students approach their studies. A learning approach involves how students learn for examinations and how they try to adapt to higher education (Jungert & Rosander, 2009). Traditionally literature distinguishes between two or three learning approaches: the deep approach, the surface approach and in some occasions the strategic approach is included as well (Entwistle et al., 1979; Parpala et al., 2010 and Vanthournout et al., 2013). As was mentioned before, the strategic approach was derived from the cue-profiles, and the notion that students are influenced by how they will be assessed (Ramsden, 1979). The other two approaches distinguish between meaningful learning (a deep approach) and simply memorising (a surface approach) (Reid et al., 2012 and Vanthournout et al., 2013).

Students taking on a deep approach engage in meaningful learning and relate new information to prior learned information (Reid et al, 2012). Students adopting a surface approach are usually less motivated, learn by memorising and often don't recognise the bigger picture (Reid et al., 2012 and Vanthournout et al., 2013). The strategic approach is a different approach, because the emphasis lies on organisation and planning (Parpala et al, 2010). When taking on a strategic approach, students organise their learning and their goal is to do well when assessed (Reid et al., 2012). This approach may also be called the achieving approach, but researchers are not sure about the validity of this approach as a separate construct (Vanthournout et al., 2013). It was therefore suggested that the strategic or achieving part of a

learning approach should be part of the deep and surface approach (Kember & Leung, 1998; Zeegers, 2002 and Vanthournout et al., 2013).

Learning approaches are generally found with the Study Process Questionnaire (SPQ), or the revised two-factor Student Process Questionnaire (R-SPQ-2F) (Biggs et al., 2001 and Vanthournout et al., 2013). The SPQ assesses the three learning approaches: deep, surface and achieving/strategy, and the R-SPQ-2F assess only the deep and the surface learning approach with subscales on motive and strategy (Biggs, Kember & Leung, 2001). The aim of this study is to create a new instrument that assesses the cue-profiles, which are learning approaches, with the knowledge of the underlying dimensions, so with multiple scales that will be assessed.

Learning environment

What is not included in assessing the general learning approaches, is the influence of the learning environment (Wierstra et al., 2003; Jungert & Rosander, 2009 and Parpala et al., 2010). With learning environment Parpala, Lindblom-Ylänne, Komulainen, Litmanen and Hirsto (2010) meant the means of communication in a department, the culture within a department and the production of knowledge. Jungert and Rosander (2009) call this the study environment: the context of where learning and teaching takes place.

The learning approaches and the learning environment have never been measured as one construct (Trigwell & Posser, 1991; Wierstra et al., 2003; Jungert & Rosander, 2009 and Parpala et al., 2010). However, researchers have substantial evidence that the learning approaches and the learning environment are strongly related (Vanthournout et al., 2013). Differences were found between learning approaches in the applied sciences (the surface approach was mostly found here) and the social sciences (students were more likely to have a deep approach) (Parpala et al., 2010). Even though this relationship was found, Vanthournout et al (2013) emphasize the variability of the learning environment, the learning approaches and the students (gender, age and academic performance).

A part of the learning environment, for the most part the interactions in and outside the classroom, is also part of assessing the cue-profiles. Miller and Parlett (1974) found that based on these interactions, a student adopts a certain approach.

Miller and Parlett's Cue-Profiles

The cue-profiles were found when Miller and Parlett studied the assessment practice of the law department at Edinburgh University. What they unexpectedly discovered, were three different approaches when they interviewed thirty students of the law department about

examinations. Miller and Parlett (1974) were interested in how these students prepared for and reacted on assessment tasks and based on the students' answers, the students could be categorised into three groups.

The first group of students that Miller and Parlett identified, approached their studying and learning in a strategic way. These students, Miller and Parlett called them "cue-seeking", were actively trying to impress their teachers and the staff-members of the department. The cue-seeking students were under the impression that when a teacher or staff-member thought well of them, this would also reflect well on their grades. Moreover, the cue-seeking students focussed on assessment criteria to perform better at assessment tasks. Some cue-seeking students mentioned in the interviews that they saw the assessment system as a flawed system that could be 'played'. The use of assessment criteria and hints about the assessment tasks (cues) given by the teachers, was seen as a technique in the assessment 'game' (Miller & Parlett, 1974).

The second group of students that Miller and Parlett could identify as a different approach, was what they called the "cue-conscious" students. These students were aware that teachers and staff-members sometimes gave hints about what was expected from them at assessment tasks. They registered these cues and gave this information extra attention when preparing for their assessment tasks. However, they lacked the activity component. They were not asking the teachers or staff-members about upcoming examinations, nor were they under the impression that bonding with the teachers or staff-members would in any way affect their grades.

The last group of students that Miller and Parlett identified, were labelled as "cue-deaf". This group of students appeared to be the opposite of the cue-seeking students. They did not concern themselves with searching or even registering hints about assessment tasks, whether this was intentional or not. These students relied on their own abilities to pass or fail an assessment task and some were anxious that if they would focus on the criteria and cues given by the teachers, they would probably miss other information that could make them pass an examination.

Miller and Parlett (1974) described and identified the cue-profiles first as one construct, based on how the students did or did not use the cues and the curriculum, after which they described other differences between the three cue-profiles. They noticed for example differences in academic performance, academic efforts, interests and intellectual development. Research on the deep and surface approach explains that the differences between motivation, academic performance and strategy in the learning approaches are in fact underlying

dimensions of learning approaches (Entwistle et al., 1979; Biggs et al., 2001 and Vanthournout et al., 2013).

Underlying Dimensions of the Cue-Profiles

The cue-profiles are mainly based on the cues (if they notice them and how students use them), attitude (if they are trying to make a good impression on teachers and/or staff-members) and curriculum (if they notice a difference between what is formally required and what is actually required to get a good grade) (Miller & Parlett, 1974).

Motivation is one of the subscales measured by both the SPQ and the R-SPQ-2F for learning approaches (Biggs et al., 2001). This would suggest that motive, or motivation is an important underlying dimension of the learning approaches. Jungert and Rosander (2009) mention in their paper that cue-seeking students, as defined by Miller and Parlett, are very competitive and aim to do better than other students. On top of this, Miller and Parlett (1974) mention themselves that cue-seeking students are motivated to get good grades, but the motivation of the cue-seeking students seems to be neither based on intrinsic motives, nor extrinsic motives, but primarily focussed on high academic performance.

Elliott and McGregor (2001) define this motivation that is focussed on academic performance as motivation to achieve in a framework of achievement goals. The framework distinguishes between the definition (mastery and performance) and the valence (positive and negative). When students have a performance approach in motivation, they compare their competence relative to others while students with a mastery approach focus on development by mastering their assessment tasks (Elliott & McGregor, 2001). Positive valence is when students formulate their achievement goals mostly in success stories than in stories of failure, which is negative valence (Elliott & McGregor, 2001).

In the motivation framework of Elliott and McGregor, the cue-seeking students would therefore score high on performance, because they are so competitive and according to Jungert and Rosander (2009) aim to do better than other students. Jungert and Rosander (2009) do not mention the other cue-profiles, but Miller and Parlett (1974) agree that cue-deaf students rely for the most part on their own abilities instead of cues. Cue-deaf students are thus more likely to score higher on motivation mastery in the motivation framework of Elliott and McGregor. Cue-conscious students rely on both their own abilities and the cues (Miller & Parlett, 1974), in the framework of Elliot and McGregor, they would most likely score higher on mastery than on the performance scale, because they are less competitive than the cue-seeking students and lack the activity component of searching for cues (Miller & Parlett, 1974).

Another dimension that Miller and Parlett (1974) later on describe in their report is the intellectual processes of the cue-profiles. Other researchers however, prefer to look at the organisation- and planning skills of a student (Ramsden, 1979; Entwistle et al., 1979; Vanthournout et al., 2013), which is also referred to as the strategic part of the learning approaches (Biggs et al., 2001).

Clark (2012) states that students reflecting on their own learning and assessing whether they meet the criteria and standards, have a high level of metacognition. In addition to this Entwistle and Peterson (2004) found that when a student is able to self-regulate, they are also more likely to take on a strategic approach in learning. Cue-deaf students have, as was found by Miller and Parlett (1974), lower grades and they do not use the cues to their benefit. This could mean that they would score lower on the metacognition scale, because they are less able to reflect on their own learning and what is necessary to get high grades. Cue-conscious and cue-seeking students score high on academic performance (Miller & Parlett, 1974) and this would mean that they would score higher on the metacognition scale.

Current Study

Five underlying dimensions have now been identified: cues, attitude, curriculum, motivation (to achieve) and metacognition. These underlying dimensions will be transformed into scales that can be assessed in the CPQ. Even though the research and the cue-profiles from Miller and Parlett (1974) have been criticised, it is also known that a difficult relationship exists between the learning approaches and the learning environment (Parpala et al., 2010 and Vanthournout et al., 2013). The CPQ might serve as an instrument that can open up the scope of finding what this relationship truly entails and how they relate.

The three cue-profiles from Miller and Parlett (1974) were all found in the law department of Edinburgh University. So instead of changing the learning environment as is done in many research (Vanthournout et al., 2013), this study focusses on the differences between students in general, based on the characteristics that stood out according to Miller and Parlett (1974) by including aspects from the learning environment in the cue-profiles (cues and curriculum).

This study also aims to contribute to Norton's paradox (2004), as was explained in the introduction of this article. Cue-seeking students focus on the criteria of the assessment tasks as a part of their technique to 'play' the system (Miller & Parlett, 1974), but the cue-seeking students paradoxically should have the highest risk of focussing on the superficial aspects of the assessment task instead of engaging in meaningful learning (Norton, 2004).

It could be argued that these students could also be found with the SPQ or the R-SPQ-2F, because students with a surface approach also have a higher risk of focussing on the superficial aspects of an assessment task, because they are usually less motivated and they are often unaware of the bigger picture (Reid et al., 2012). But a strange contradiction arises with this matter. Parpala et al (2010) have stated that at universities, the students studying social sciences usually approach their learning with a deep approach and that students studying an exact science approach their studying usually with a surface approach. On the other hand Ramsden (1979) mentions that the social sciences department is very informal. A student in the social sciences will more easily raise his hand and ask questions, while a student studying an exact science will do as he is told without asking (many) questions (Ramsden, 1979). The strange contradiction of this situation is that cue-seeking students would more likely be found in the informal departments than in the formal departments (Joughin, 2010).

The consequence of only looking at the deep and surface approach could therefore lead to false assumptions about which students have a higher risk on focussing on the superficial aspects of an assessment task. That is why this study tries to provide different perspective on the situation of the learning approaches.

The cue-profiles will be assessed with the CPQ (see Appendix A), constructed with six scales. However, Miller and Parlett (1974) found the three cue-profiles in the data that they collected from individual interviews. To be sure of the validity of the CPQ, three interviews were conducted after the questionnaire with three students. These interviews are meant to support the results of the questionnaire and to be able to compare this study with the study of Miller and Parlett (1974).

Method

Participants

The sample used for this study consists of fifty students following higher education in the Netherlands. Their participation was requested through social media and on voluntary basis. The age of the participants vary between 19 and 49 ($M = 25.72$, $SD = 7.99$). Most of the participating students were female (82%) and 18% were male students. More than half of the students study Educational Sciences (56%), 16% study Liberal Arts and Sciences, 8% study another social science than Educational Sciences, 8% study languages, another 8% study Law and Economics and two students (4%) study an exact science. Most of the students were following a pre-master or were in their first study year (32%), second year students and third students follow with both 24% and 20% of the students were fourth or later year students.

Two female participants were interviewed and one male participant was interviewed, based on their response to the follow-up e-mail and their average scores on the CPQ. The first female student studies social studies (both Pedagogy and Educational Sciences), is nineteen years old and she scored relatively low on the CPQ items (most scores below 3.0). The male student studies Economics, is twenty-one years old and he scored averagely around 3.0 on the CPQ items. The second female student studies Liberal Arts and Sciences, is twenty-two years old and she scored relatively high on the CPQ items (most scores were greater than 3.5).

Materials and procedure

The CPQ was shared online on social media pages that are only available to students following higher education. After the analysis of the results of the CPQ, a follow-up e-mail was sent to participants willing to be interviewed. In consultation with the participants willing to be interviewed, interviews were set up on a date of choice and either face to face or through Skype. Beforehand, participants were informed on the topic of the interview and asked if the interview could be tape-recorded. None of the participants objected and all three interviews took about one hour and a half to complete.

Instruments

The CPQ has been piloted (see Appendix B), but some items were revised to relate the questions more closely to the subject of the cue-profiles (see Appendix A). The piloted questionnaire had thirty-one items and the new questionnaire (the CPQ) that was used for the current study has thirty-four items. All items are in Dutch, because all the participants are Dutch. All items could be responded to on a 5 point Likert scale range from with “totally disagree”(1) and “totally agree” (5).

The first scale, *motivation mastery*, has four items. A motivation scale was already included in the pilot, but the validity and reliability was insufficient for further use. The four items that were added in the scale *motivation mastery* are all items from the questionnaire from Elliott and McGregor about motivation to achieve (2001). Elliott and McGregor included valence (approach or avoidance) in their scales, so it would be possible that the factor analysis will divide the scale *motivation mastery* into two subscales. The two subscales are not used as separate underlying dimensions of the CPQ, because it is yet unknown if and how the valence of the items relates to the cue-profiles. One of the items of Elliott and McGregor (2001) included in the CPQ for *motivation mastery* is for example: “I want to learn as much as I possible from

this class". The items of the questionnaire of Elliot and McGregor (2001) are used in the CPQ in order to be certain that the items from motivation to achieve are reliable and valid.

The second scale that will be assessed in the CPQ is *motivation performance* with four items. These items are from Elliot and McGregor's questionnaire (2001) as well. Valence was again included in the items, which opens up the possibility that after analysing the results of the factor analysis, this scale might have to be divided into two subscales. One of the items for this scale is "It is important for me to do better than other students."

The third scale, *cues*, has eight items. This scale is included to measure the students' awareness and use of cues. The items in the CPQ are based on the research report of Miller and Parlett (1974) and their definition of the cue-profiles and cues. One item is for instance "I prefer a teacher who tells me what the important subjects are going to be in the upcoming exam". Cronbach's alpha for the scale *cues* in the pilot was .67 on all eight items. Some items were revised, due to low inter-item correlations.

The fourth scale, *curriculum*, has five items. This scale was included to assess whether students notice a gap between what is formally required and what is informally required. If students do have the idea that there is a so-called hidden curriculum, than it is more likely they will seek cues to know what the actual requirements are (Miller & Parlett, 1974 and Joughin, 2010). One of the items for this scale is: "Before the course starts, I read the goals of the course in the manual". Cronbach's alpha was .85 for this scale, after one item had been deleted. In the CPQ a new item was made to replace the deleted item.

The fifth scale, *metacognition*, has five items as well. Questions like "I read articles or study books thoroughly" were included and other items about preparing for exams and how students read the required literature were included as well, for Clark (2012) states that metacognition involves organising and planning coursework. Cronbach's alpha for *metacognition* was .77 on all items in the pilot.

The last scale is *attitude*, with eight items. The items for this scale are questions about student-teacher interactions, for example "I like to discuss the content of a course with the teacher" is one of the items for this scale. In the pilot, Cronbach's alpha for this scale was .83. In the CPQ one unreliable item was deleted and four items were added, to get a better picture of the student-teacher interactions, and the activity component that cue-seeking students are likely to have.

What was not included in the piloted questionnaire were items about grades to explore the possible connection between the cue-profiles and academic performance. In the CPQ two

items are added where students can fill in their last achieved grades on exams and their last achieved grades on coursework.

The interviews following the questionnaire will be semi-structured, meaning that the interview is partly structured by maintaining a topic list, but on the other hand the participants are given enough space to further elaborate on a subject that may come up. The topic list was constructed based on the 'core-questions' asked by Miller and Parlett (1974). The topic list can be found in Appendix C, and the themes that will be discussed are the preparation for the exams, the attitude towards teachers and staff, perspective on their study (what do they study and why) and how they generally perform on assessment tasks. The interviews will be tape-recorded if permission is given by the student. Besides the tape-recordings, notes will be taken to get a full report on the interviews.

Analysis

The obtained data from the CPQ were analysed with SPSS 20. First negatively scaled items were reversed before any analyses. The validity of the scales was tested with a factor analysis to check the assumption the cue-profiles consist of the multiple underlying dimensions, assessed with the scales *metacognition*, *attitude*, *curriculum*, *cues*, *motivation mastery* and *motivation performance* with corresponding items. After the factor analysis, per scale reliability was also tested with Cronbach's alpha to measure internal consistency of the items.

Between the scales, some coherent relationship should be found if the scales are indeed underlying dimensions of one construct (the cue-profiles). A correlation coefficient would be a good way to find an interrelationship between the scales. Depending on the results of the factor analysis, it might be possible that the scale *cues* can be interpreted as a dependent factor, since the cue-profiles mostly consist of the awareness and use of cues (Miller and Parlett, 1974). In this case, a multiple regression analysis (MRA) will be performed to measure whether the other scales are accurate predictors for the scale *cues*.

Based on the literature of Vanthournout et al (2013), the mean scores were compared per scale based on gender and study. For gender an independent samples *t*-test was used to compare the mean scores per scale of female participants with the mean scores per scale of the male participants. A one-way analysis of variance (ANOVA) was conducted to compare variance of the mean scores per scale between students from different studies.

The interviews were analysed with Weft QDA, an open-source tool to process interviews and assigning codes and sub-codes to the transcript. The interviews are axial coded, so the codes are assigned per meaningful subject. This way the results of the students'

questionnaires can be compared with their answers to the questions. Differences and similarities between the answers and the results of the questionnaires will be discussed in the discussion. Since the study of Miller and Parlett (1974) is the source of the cue-profiles, a comparison was also made between their study results and the results of this study.

Results

Quality of the scales: initial factor analysis

Items 4, 15, 22 and 29 were negatively scaled, so these items were reversed (1 = 5, 2 = 4, 3 = 3, 4 = 2 and 5 = 1). After this, all items were tested for normality of variance. Seven items deviated from normality of variance, because an answer was chosen by half or more than half of the participants. On item 29, 76% of the participants chose for answer 1. The content of item 29 was “If a teacher gives me feedback, I could not care less”. Due to the last part of the sentence “I could not care less”, it can be concluded that the item was too extreme. Item 29 was therefore deleted, because based on variance and content, this item was not valid. On item 33 more than half of the participants (54%) chose for answer 1. This item asks participants “When I go to a meeting to review an examination, I can always gain some extra points”. Again it can be concluded that the item was too extreme, due to the word “always”, causing participants to choose the same answer. Item 32 proceeds item 33, this item’s content is “When I have taken an examination, I always attend the meeting to review the examination”. If item 33 is deleted it would be best to delete item 32 as well, because item 32 in itself does not assess if the participant is actively trying to get a better grade. Moreover, the determination of time “always” can again be seen as too extreme even though variance of this item was roughly normal. The other five items (items 6, 7, 21, 27 and 30) were not deleted. The scores of these items were not extremely distributed in one direction, nor was the content of these items a cause for concern. All in all it was chosen to keep these items based on the content validity of the CPQ, in order to assess what was intended to assess with the CPQ.

The initial factor analysis consisted of a varimax rotated factor analysis, which was conducted to statistically test if indeed underlying factors were tested in the CPQ. In the previous analysis three items were deleted, so the factor analysis was conducted on thirty-one items instead of thirty-four items. It was hypothesized that the factors from the factor analysis would match the predetermined scales *cues*, *metacognition*, *motivation (mastery and performance)*, *curriculum* and *attitude*. Prior to the factor analysis, Barlett’s test of sphericity

was conducted to provide information about the factorability of the data. Barlett's test was significant, $p < .001$, indicating that the data was suitable for a factor analysis.

Ten factors were identified based on an Eigenvalue exceeding 1. In total, these factors accounted for approximately 81% of the variance of the CPQ data. The factors from the factor analysis did not resemble the predetermined scales. This indicates that either some items were invalid or that the predetermined factors were not measured with the CPQ. To explore this, some items were reviewed again to check if they matched what they were meant for to measure.

The scale *cues* was made to measure the participant's awareness and use of cues. Not all items were in accordance with this content. Item 2 asks participants if they take notes during lectures to let nothing slip past them. However, taking notes does not necessarily involve cues, therefore item 2 is deleted, because it does not measure what was intended to be measured within the factor cues.

The content of item 17 for the scale *cues* is questionable as well. This item asks if participants want to know into detail what a teacher means with his feedback. The details and the feedback refer to cues, but indirectly this item asks if the participants ask many questions to get more details from the teacher. Instead of *cues*, this item could therefore also fit in the scale *attitude*, because it actually measures if the participant is actively trying to get information from the teacher about his assessment task. All in all based on the content of item 17, it was chosen to transfer this item from the scale *cues* to the scale *attitude*.

Item 23 is similar to item 17, because it asks participants if they ask their teacher as many questions as possible in order to get an idea about the main topics and most important elements of a course. The main topics and the most important elements refer to the scale *cues*, but this item asks if the participant is "asking" for these cues, so this item also measures the activity of the participant. Therefore item 23 was also transferred to the scale *attitude*.

The scale *curriculum* was made with the intention to measure the participant's awareness about differences between formal and informal requirements, in which the informal requirements are found by cues. The items made for this factor scale still match the intended content of the scale *curriculum*, but they resemble the items from the scale *cues* as well. Both scales measure the awareness of the participants in the class and if they use this awareness to their benefit. As was described in the theoretical framework, Miller and Parlett (1974) used the use of cues and curriculum as one construct and later on described other aspects of the cue-profiles. The intention of the CPQ was to treat all underlying dimensions equally, but the results of the factor analysis demand another approach. Like the research from Miller and Parlett (1974) it was chosen to combine the four items that are left from the scale *cues* and the five

items from the scale *curriculum* into a new scale “*Cue Awareness*”. The other scales, *motivation mastery*, *motivation performance*, *metacognition* and *attitude*, are now seen as possible predictors for *cue-awareness*. Further analyses will entail a new factor analysis for the predictors, a new factor analysis for *cue-awareness*, reliability analysis with Cronbach’s alpha and regression analyses to measure the correlations between the predictors and the *cue-awareness*.

Table 1

Scales and items used for analysis

Predictors		Dependent factor			
	<i>Metacognition</i>	<i>Attitude</i>	<i>Motivation Performance</i>	<i>Motivation Mastery</i>	<i>Cue-Awareness</i> (former <i>Cues</i> and <i>Curriculum</i>)
	<i>n</i>				
Items	Item 4	Item 5	Item 1	Item 11	Item 3
	I read articles or study books globally	I think it is important that the teacher sees me as a good student	It is important for me to do better than other students	I worry that I may not learn all that I possibly could in this class	Before the course starts, I read the goals of the course in the manual
	Item 9	Item 10	Item 6	Item 16	Item 7
	I read articles or study books thoroughly	I try my best to impress the teacher	My goal is to get a better grade than most of the other students	Sometimes I’m afraid that I may not understand the content of this class as thoroughly as I’d like	When a teacher makes a comment about an upcoming exam, I remember this information to use it when learning for that exam
	Item 14	Item 15	Item 31	Item 21	Item 8
	I plan the preparation for	It doesn’t matter to me if the teacher sees	I just want to avoid doing poorly in class	I want to learn as much as	Reading through the syllabus before

examinations thoroughly me as a good student possible from this class the course starts is important to me

Item 19

When I make a planning, I stick to it

Item 17

When the teacher gives feedback, I want to know into detail what he means

Item 34

My goal in this class is to avoid performing poorly

Item 27

It is important for me to understand the content of this course as thoroughly as possible

Item 12

I use the tips given for an exam as guidelines for learning

Item 25

When finished learning, I check if I have truly learned everything

Item 20

I like to discuss the content of a course with the teacher

Item 13

During studying for an exam, I use the learning goals to get an overview of the main topics

Item 23

I ask many questions in order to get an overview of the most important aspects of a course

Item 18

For an exam, I first learn what has been told during lectures, and then the remaining literature

Item 26

When the teacher is impressed by me, I think this can affect the grade of a paper

Item 22

When a teacher gives feedback, I do not change everything that he has advised

Item 30

When the teacher is impressed by me, I think this can affect the

Item 24

I regularly notice a difference between what is formally

grade of an
examination

required and
what is assessed

Item 28

I prefer a
teacher who
tells the
important
subjects that
will be assessed
in an exam

Quality of the scales: the predictors

First the predictors *motivation mastery*, *motivation performance*, *metacognition* and *attitude* were analysed with a varimax rotated factor analysis. Seven factors were found, explaining 80% of the variance. Just like the initial factor analysis, the factors do not completely match the predetermined factors. The factors from the factor analysis will be interpreted to see if the content of the factors can be explained.

The first factor consists of five items. Four items belong to the predetermined scale *metacognition* (items 9, 14, 19 and 25) and one item to the predetermined scale *motivation mastery* (item 21). The items from *metacognition* measure how accurate students learn and plan their learning. The item from *motivation mastery* asks participants if they want to understand the content of their course as well as possible. This item fits in this factor, because it also concerns how thorough students study for their course. On the other hand it would be expected that this item would fit better with more items from the predetermined scale *motivation mastery*. The loading of this item for factor 1 is .549, but after the interpreting the rest of the factors from the factor analysis it will be determined where this item would fit best based on content and factor loading. For now this factor with five items will be called *learning accuracy*.

The second factor from the factor analysis consists of six items. Three items match the predetermined scale *attitude* (items 5, 10 and 15), two items match the predetermined scale *motivation mastery* (items 21 and 27) and one item matches the predetermined scale *motivation performance* (item 34). The items from the predetermined scale *attitude* ask if the participants think it is important to make a good impression on the teacher. The two items from the predetermined scale *motivation mastery* are concerned with learning the content and as much

as is possible in a course. The item from *motivation performance* asks the participant if he wants to avoid performing poorly in class. The items together in this factor seem to entail the outer performance of a student. Learning the content and avoiding failure in class could influence the impression that a teacher has of the student. Based on the content of factor 2, this factor will be called *outer performance*.

The third factor consists of four items. Two items match the predetermined scale *attitude* (items 26 and 30) and the other two items match the predetermined scale *motivation performance* (items 31 and 34). The two items from the scale *attitude* ask if participants think that if they make a better impression on the teacher that they could also get a better grade on either an exam or a paper. The two items from the scale *motivation performance* ask participants if they want to avoid failure in general and more specifically in class. The four items combined seem to share the content of making a good impression to avoid failure. This factor will be called *failure avoidance*.

The fourth factor consists of three items. Two items match the predetermined scale *attitude* (items 20 and 23) and one item matches the predetermined scale *motivation mastery* (item 27). The two items from the scale *attitude* ask the participant if they like discussing coursework with the teacher and if they ask questions about the main learning goals of the course. The item from *motivation mastery* asks if participants want to learn as much as possible. The first two items share the content of asking and discussing, making conversation with the teacher. The last item seems to add to this that these conversations with the teachers can be used to learn as much as possible. This factor will be called *student-teacher conversation*.

The fifth factor from the factor analysis consists of three items. Two items are from the predetermined scale *metacognition* (items 4 and 9) and one is, again, from the predetermined scale *motivation mastery* (item 27). The first item from *metacognition* asks if students read their books or articles broadly (this item was reversed) and the second item asks if students read their books or articles thoroughly. Matched with the item from *motivation mastery*, these items combined could cover the need to learn as much as possible by reading books and articles thoroughly. Based on the content of the items, factor 5 will be called *learning through reading*.

The sixth factor consists of only two items. These two items are from the predetermined scale *motivation performance* (items 1 and 6). Both items belong to one of the subscales of *motivation performance*, namely the *motivation performance approach*. This factor will therefore be called *motivation performance approach*, like the subscale.

The seventh factor from the factor analysis also consists of only two items (items 11 and 16). Just like the previous factor, both items belong to a subscale, but in this case they belong

Item 30	.774		
AT			
Item 31	.732		
MP			
Item 34	.578		
MP			
Item 20		.888	
AT			
Item 23		.867	
AT			
Item 4			.908
MC			
Item 9			.711
MC			
Item 27			.539
MM			
Item 1			.811
MP			
Item 6			.786
MP			
Item 11			.912
MM			
Item 16			.500
MM			

Note. MC = Metacognition, AT = Attitude, MP = Motivation Performance and MM = Motivation Mastery.
N = 50.

The factors of the factor analysis will be considered as the predictors, because the content only slightly differs and the aim of the analyses is to find a correlation between the scales and Cue Awareness. Reliability of these predictors was tested with Cronbach's alpha and results can be found in Table 3 . Reliability of the predictors can be seen as adequate because the Cronbach's alpha for all the scales are .65 or higher.

Table 3

Predictors based on factor analysis with Cronbach's alpha

Predictor	N	Cronbach's alpha
Learning Accuracy	3	.87
Outer Performance	4	.83
Failure Avoidance	4	.78

Student-Teacher	2	.83
Conversation		
Learning Through Reading	3	.80
Motivation	Performance 2	.70
Approach		
Motivation	Mastery 2	.65
Avoidance		

Note. N = number of items

Quality of the scales: the dependent factor

For the scale *cue-awareness* another factor analysis was performed. This factor is now used as the dependent factor in further analysis. *Cue-awareness* was compiled at the beginning of this chapter with the two predetermined scales *cues* and *curriculum*. It was therefore expected that this factor analysis would show more than one factor, because aside from the awareness that all items share in content, the items still defer in some ways. The factor analysis will statistically show in what ways the items defer, after which conclusions will be drawn to what extent the results of the factor analysis have consequences for further analyses.

The scale *cue-awareness* consists of nine items. The factor analysis divided these items between three factors, explaining 69% of the variance. The first factor consists of three items that share the content of awareness of formal requirements. The second factor consists of five items, but item 12 loads higher on factor 3 and the content is more in accordance with factor 3, so it was chosen to consider item 12 as a part of factor 3 instead of factor 2. The content of factor 2 covers the awareness of informal requirements. The third factor consists of only two items, and these items also cover the awareness of informal requirements, but in contrast with factor 2, this factor asks indirectly if students ignore the formal requirements and only focus on the informal requirements.

The Cronbach's alpha for *cue-awareness* is .53, indicating that this factor is not adequately reliable. If item 22 were to be deleted, Cronbach's alpha would increase to .59. Item 22 is a reversed item, asking participants if they do not change their coursework based on the feedback of the teacher. The feedback could be seen as a cue, because this is a moment where the teacher explains his requirements to get a better grade. However, both the factor analysis and the reliability analysis show that this item probably is not measuring the intended content. Feedback is a complex concept and this item could have confused the participants, because of

the concept and moreover because this item was in negative form. It is therefore chosen to exclude item 22 from further analyses.

As a consequence, only two factors remain: *awareness formal requirements* (three items) and *awareness informal requirements* (five items). Cronbach's alpha for *awareness formal requirements* remains the same and Cronbach's alpha for *awareness informal requirements* increases to .54.

For the regression analyses, the predictors will be correlated with *cue-awareness*. This decision was made based on the reliability analysis and to explore the correlation between *cue-awareness* and the predictors. The reliability of the predictors are sufficient for the regression analyses. Cronbach's alpha for the dependent factor *cue-awareness* is .59 and a reliable Cronbach's alpha is found at .60 or higher. In the discussion of this article it will be taken into account that the results of the regression analyses can be biased, due to insufficient reliability.

Table 4

Reliability tested with Cronbach's alpha based on the factor analysis of the dependent scales

Dependent Factor	<i>N</i>	Cronbach's alpha
Cue Awareness	8	.53
Awareness Requirements	Formal 3	.80
Awareness Requirements	Informal 5	.54

Note. N = number of items

Regression analyses

A multiple regression analysis (MRA) was performed to see to what extent the predictors can account for the variance of *cue-awareness*. Prior to MRA the predictors and the dependent scale *cue-awareness* were tested for several assumptions. First normality was checked with stem-and-leaf plots and boxplots. Both indicated that the data is roughly normal distributed and no univariate outliers were found. Secondly, a scatterplot of standardised residuals against standardised predicted and a normal probability plot showed that the assumptions of normality, homoscedasticity and linearity were met. Third, with the MRA the Mahalanobis distance was checked as well. The Mahalanobis distance did not exceed the critical χ^2 for $df = 7$ of 24.32 (at $\alpha = .001$) in the data, so it can be assumed that no multivariate

outliers are in the data. Last, the tolerance of the predictors was above 0.2 and the VIFs of the predictors were all below 5, indicating that there are no cases of multicollinearity.

The predictors accounted for a significant ($\alpha < .01$) 43% of variability of *cue-awareness*, $R^2 = .43$, adjusted $R^2 = .34$, $F = (7, 42) = 4.56$, $p = .001$. Whereas the predictor *motivation mastery avoidance* accounted for a significant proportion of unique variance in *cue-awareness*, $t = 4.01$, $p < .001$. In Table 5 each predictor with its squared semi-partial correlations (sr^2) and corresponding unstandardized (B) and standardized (β) regression coefficients are presented.

Table 5

Unstandardized (B) and standardized (β) regression coefficients and semi-partial correlations per predictor for dependent factor Cue-Awareness

Variable	B [95% CI]	B	sr^2
Learning Accuracy	.091 [-.051, .234]	.187	.150
Outer Performance	-.135 [-.395, .126]	-.191	-.121
Failure Avoidance	-.198 [-.359, -.037]	-.356	-.289
Student-Teacher Conversation	.162 [.019, .304]	.301	.266
Learning Through Reading	-.100 [-.296, .095]	-.162	-.121
Motivation Performance Approach	.178 [.013, .344]	.299	.253
Motivation Mastery Avoidance	.320 [.159, .481]*	.562	.466

Note. $N = 50$. $CI = Confidence Interval$. * $p < .001$

Group differences

An independent samples *t* test was used to compare the mean scores on the different scales between male and female participants. The Saphiro-Wilk statistics were not significant, indicating that the assumption of normality was met. Levene's test for all scales was also non-significant, and therefore equal variances could be assumed. All *t* tests were non-significant as well (see Appendix D).

A one-way between groups ANOVA was used to compare the different studies of the participants per scale. The mean scores were used per scale. The ANOVA for the predictors was non-significant. The ANOVA for the dependent scale *cue-awareness* was however significant, indicating that what a student studies influences the awareness of cues, $F(6, 43) = 5.52, p < .001, \eta^2 = .435$.

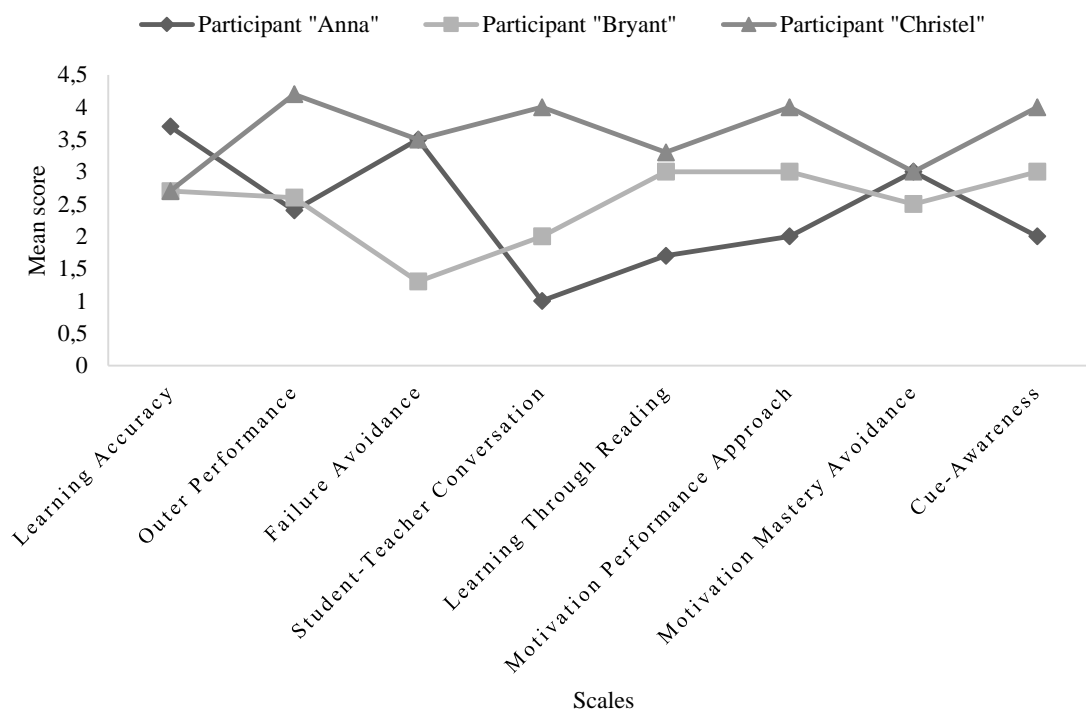
Post hoc analyses with Tukey's HSD (using an α of .05) revealed that students studying Social Sciences (for the most part Pedagogy) ($M = 2.26, SD = 0.38$) had significantly lower mean scores than students studying Educational Sciences ($M = 3.37, SD = 0.45$), Premaster Social Sciences ($M = 3.36, SD = 0.40$), Liberal Arts and Sciences ($M = 3.47, SD = 0.48$) or Sciences ($M = 3.63, SD = 0.71$). In comparison with Languages ($M = 2.72, SD = 0.59$) and Economics ($M = 2.81, SD = 0.39$), no significant difference was found, nor did the other studies showed any significant differences.

Interviews

Three students participated in interviews. The aim of the interviews was to compare results with both the questionnaire and the qualitative research of Miller and Parlett (1974). After the factor analysis a mean score per scale was calculated per participant (see Graph 1), based on these mean scores and the report of Miller and Parlett, the results of the interviews will be described below along four themes that came in the interviews and after axial coding. Participants were given fake names to maintain anonymity.

Graph 1

Mean scores per scale for each interviewed participant



Study happiness

The first theme that came up in all interviews, was study happiness and their content of the study that they had chosen. This topic was not included in the CPQ, nor in the qualitative report of Miller and Parlett (1974), but it does explain part of the motivation that the participants have or do not have to perform well.

Anna studies pedagogy and educational sciences. Pedagogy is her main study, but in her second year she discovered that Pedagogy was not what she really wanted to study. This could explain her low mean score on *motivation performance approach* and her somewhat higher score on *motivation mastery avoidance* and *failure avoidance*. Because she wants to get through her study “to get it over with”, she wants to avoid failure as much as possible, but is not concerned with how others perform.

Bryant studies Public Management and Administration. He likes his study and likes to perform well, especially compared to others. This explains his somewhat higher mean score for *motivation performance approach*. His lower scores for *motivation mastery avoidance* and *failure avoidance* cannot be explained by his answers on this theme.

Christel studies Liberal Arts and Sciences and she is majoring in Philosophy. She discovered the study Liberal Arts and Sciences through a friend of hers and was enthusiastic from the beginning. She had the highest mean score for *motivation performance approach* and

she had high mean scores as well for *failure avoidance* and *motivation mastery avoidance*, indicating that she is motivated for the study she likes.

Preparation for examinations

The second theme that came forward from the transcription codes was preparation for exams. When Anna was asked about how she approached her learning, she explains that she summarizes “everything”. Just like the cue-deaf students from Miller and Parlett (1974) she tried to revise all of the examination material. She also had the highest mean score for *learning accuracy*, which can be explained by her comment that she tries summarize everything and her aim is to learn everything as thoroughly as possible. In contrast to this, is her mean score for *learning through reading*. Indicating that through summarizing everything, she is not actually reading accurately.

Bryant and Christel scored alike on the mean score for *learning accuracy*, and they both mention that the power point sheets used in a course are important for their learning. Bryant tells that he occasionally used his book to look up definitions or background information. When he was asked why he only used the sheets of the lectures, he explains that he used to summarize everything, including the books, but that this usually led to lower grades and a huge chaos in his head. He adds to this that the teachers tell their class what they want the class to know in the lectures and that this is exactly what the teachers later assess in examinations, so Bryant did not see a reason why he should learn anything else. This is a cue-conscious characteristic, because he uses the lectures as guidelines for examinations instead of, as he used to, summarize everything. In comparison with his mean scores, this adds up to his average scores for *learning through reading* and *cue-awareness*.

Christel prepared for examinations in a different way. Philosophy meant that she had a lot of reading to do, but due to extra-curricular activities she said that she hardly had the time to read it all, explaining her somewhat low mean score for *learning accuracy*. She prepared for examinations by discussing the examination material with her teachers in the class, discuss possible questions with her best friend (also studying Philosophy and following the same courses) and seeking out the general themes of the examinations by reviewing the power point sheets and following the social media pages from the courses to get summarizations from other students. Like a cue-seeking student from Miller and Parlett (1974) she was constantly using the main themes from the courses as guidelines and used discussions with teachers and her best friend to further elaborate her knowledge for the upcoming examinations. This is supported by her high mean score for both *student-teacher conversation* and *cue-awareness*.

Attitude towards teachers

The third theme that was discussed in the interviews was attitude towards teachers. According to Anna her attitude towards teachers depended on what teacher was in front of her. However, during her study she had rarely spoken to any of her teachers and if she did it was usually to get feedback and not to ask them questions. She did firmly state that teachers, or anyone for that matter, could never be objective. Either conscious or subconscious, she believed that teachers had favourites. But when she was asked if she ever acted on that statement, she said that she did not, because she had actually never really thought about it. This contributes to her low mean score for *student-teacher conversation* and *outer performance* and to the report of Miller and Parlett (1974) where it is stated that cue-deaf students usually do not engage in contact with their teachers. Since Anna's mean scores are generally low, it could be assumed that she is most likely a cue-deaf student.

Bryant did not think teachers had favourites. But he did occasionally have "fun" conversations with teachers, usually about soccer or other non-school related topics. He scored average on the mean score of *student-teacher conversation* and *outer performance*, which is largely supported by the fact that he mentions he does occasionally speak with his teachers. Bryant did not show the activity component of a cue-seeking student like is described by Miller and Parlett (1974), he did notice some differences between formal and informal requirements, but he stuck to the non-formal conversations with his teachers, instead of asking direct questions about the upcoming exams. Because of Bryant's average mean scores and his answers on the interviews, it would be likely that Bryant might be a cue-conscious student.

In respect to this theme Christel told stories about how teachers always have expectations that sometimes were not even close to what was formally stated in the syllabus of the course. This irritated her, but if she wanted to get a good grade, she could only act on it and depending on what teacher was in front of her, she either searched for what the alternative criteria were or she confronted the teacher about the differences. As was mentioned before, Christel had the highest mean score for *student-teacher conversation*. Adding this up to her high score for *outer performance* and her answers on the interview, she looks mostly like a cue-seeking student, as is described by Miller and Parlett (1974).

General academic performance

The last main theme that came forward in the interviews was general academic performance. Miller and Parlett (1974) stated that cue-deaf students scored generally low

grades, cue-conscious students generally average and cue-seeking students scored generally high grades. At the end of the CPQ two questions about grades were included, asking the last grade for an exam and the last grade obtained for a paper. Anna's grades were 5.5 and 6.5, Bryant's grades were the same and Christel had scored for both the exam and her last paper a 7.5.

Anna responded that she regularly had to retake examinations to pass a course. She said this happened more often when the examination material was too much for her. Unlike a cue-deaf student she seemed to blame the assessment system instead of herself for not passing examinations. Later she explained that failing was usually due to her postponing her learning which ended up in acceptance and that retaking an examination would be better, because she would have more time to learn it all.

Criteria were also not really of Anna's concern. When at the beginning of a course the learning goals were stated in a syllabus, she would print the syllabus before the first lecture, but then she would never actually read it. She just wanted to be prepared. This is supported by her low mean score for *cue-awareness*. Her grades are both average, but this can be explained by her retaking exams and papers.

Bryant said that there was not really a general line of performance. Usually it was depending on how much he had learned if he passed or failed a course. He did really dislike it when he failed a course, but he thought that he only had himself to blame, which is in contradiction with his *motivation* mean scores, since he scored higher for *motivation performance approach*.

When Christel was asked about her academic performance, Christel states that she is always paying attention and participates in group discussions. Like a cue-seeking student she displayed a very active attitude in and outside the classroom (Miller & Parlett, 1974). Even though she states that she is very interested in the courses and the study she is following, in further answers, she explains that due to extra-curricular activities she seldom has time to read all of the examination materials. "Luckily" the teacher always tells her almost everything she needs to know during lectures and seminars, which allowed her to get good or even great grades. The grades she had filled in for the CPQ match her answer in the interview, because a 7.5 can be considered a good grade.

Discussion

Correlation between predictors and Cue-Awareness

The results of the MRA showed that the predictors accounted for a significant proportion of variance in *cue-awareness*. 46% of the variance could be explained by the predictors, whereas the predictor *motivation mastery avoidance* accounted for a unique significant proportion of the variance. This indicates that *motivation mastery avoidance* might be a good predictor for assessing a cue-profile. It could therefore be expected that motivation to achieve, as it is defined by Elliott and McGregor (2001), can be seen as an underlying dimension of the cue-profiles. This study was not conclusive on this point, but that can be explained by the unreliability of *cue-awareness* and the invalidity of the scales. The reliability of the scale *cue-awareness* was only slightly below an adequate alpha, indicating that the results may not directly be applied in an academic context, but can be built upon for future research and as an indication of a pattern.

The other scales only accounted for a small proportion of variance of the dependent factor *cue-awareness* and the percentage of the variance explained, 46%, opens up the possibility that either more dimensions are underlying the cue-profiles or that due to the invalidity of the scales an error might exist in the MRA results, influencing the scores and percentages.

The validity of the scales were tested with factor analyses. The factor analyses were inconsistent with the predetermined scales assessed with the CPQ. According to Allen and Bennett (2010) this inconsistency is possible in a factor analysis when the assumption of sample size is not met. They emphasize that a sample size of at least 100 participants is necessary for a reliable factor analysis. In this study only 50 participants responded to the CPQ, so the possibility that the factor analysis was unreliable exists.

Moreover, the sample of this study consisted of fifty students, with different disciplines, different age and different gender. Vanthournout et al (2013) state that gender and study can influence a learning approach. Gender was in this study not an influence for the different scales, nor for *cue-awareness*. This can be caused by the small number of male participants in this study ($N = 9$). Study differences were found, because the ANOVA showed a significant result for Social Sciences on *cue-awareness* compared to other studies. This is a surprising result, because the Educational Sciences and Social Sciences are from the same department. It would be interesting to know what caused this difference between the mean scores for *cue-awareness*.

The external validity is questionable, because the sample for this study was based on availability of any student linked to the social media page on which the CPQ was posted. The

results of the CPQ can also hardly be generalised to every student in every academic context, even though part of the academic context is included in the CPQ.

In order to continue the analyses, the factors from the factor analyses were interpreted and used in further analyses. The factors from the factor analyses were not only more reliable, they only differed slightly from the predetermined scales. Moreover, the aim of the analyses was to explore patterns between the factors, and with the factors from the factor analysis, this goal could still be achieved. However, the underlying dimensions that were used as the predetermined scales for the CPQ were based on literature about learning approaches and the cue-profiles. These scales that are underlying dimensions of learning approaches were not found in the factor analyses as was expected, indicating that the CPQ is not a valid instrument. The interviews partly supported the outcomes of the different scales, because the student who scored generally low on each scale, also displayed most characteristics of a cue-deaf student. Unexpected was that *learning accuracy* seems more closely related to cue-deaf students than cue-seeking students. If metacognition should still be included in a revised version of the CPQ can therefore be argued. Based on the unexpected outcome of *learning accuracy* it would still be interesting to know how metacognition would relate to other scales in a revised version.

Moreover, it can be argued that metacognition in itself, for example, is a very complex concept that cannot be covered in a few questions in a mixed questionnaire. In this respect it can also be argued that participants should respond to multiple questionnaires designed for the different underlying dimensions and that the results of these questionnaires should be combined in analyses to find the patterns to find the cue-profiles. In this study this was not done to avoid a time-consuming procedure, which would also not be very desirable if in the future the cue-profiles were to be used in an academic context.

The criterion validity is questionable as well, because besides the research from Miller and Parlett (1974) it is not possible to predict future behaviour based on other research results. It is unknown if the predictors would account for the same amount of variance in the factor Cue-Awareness in future studies, nor is it possible to predict if the underlying dimensions would show expected patterns of cue-profiles.

Future studies

This study aimed to make an instrument that could assess the underlying dimensions of the cue-profiles and find a pattern in the data. The instrument that was made was invalid and unreliable. Future studies could build upon this research by recreating an instrument that can assess the underlying dimensions with, for example, existing questionnaires on the underlying

dimensions to avoid the invalidity of scales. The new instrument could still use a dependent scale, like *cue-awareness*, but with revised items and a higher reliability. The results of other reliable questionnaires per underlying dimensions can then still be correlated in a MRA. A sample of at least one hundred students would provide even more reliable results.

Another way to build upon this study would be to set aside the quantitative part and focus on a qualitative way to rediscover the cue-profiles. The interviews that were held in this study still showed some resemblance with the cue-profiles as they were found by Miller and Parlett (1974), which encourages a qualitative research on a larger scale.

When Miller and Parlett (1974) found the cue-profiles, they urged that future research should open up to the possibility of more than three cue-profiles. To prevent the scope of this research to be too big, this possibility was not included. Joughin (2010) pointed out, for example, that there is little known about the cue-deaf students and their motives to not use the cues given by teachers. It might be possible that students labelled cue-deaf are not all alike. Future research could include more cue-profiles, like another version of cue-deaf, were they to be found using for example a cluster analysis to explore the data for three or more answer patterns.

It would also be interesting for universities to know if and how the cue-profiles can be used in academic contexts. This would be interesting to know in order to deal with Norton's paradox (2004), because cue-seeking students are more likely to focus on the assessment criteria than cue-deaf students. And in contrast, the cue-deaf students are more likely to get lower grades (Miller & Parlett, 1974). Further research in a more experimental setting could evaluate the academic performance of the different cue-profiles in different learning environments with different forms of assessment. With a pre- and post-test it could be possible to explore the possibilities to influence the cue-profiles and to what extent a cue-profile is beneficial or detrimental for meaningful learning and academic performance.

Many other things are unknown about the cue-profiles. The interviews and the results of the MRA give reason to believe that cue-profiles may exist and can be found, but future research could point out if they add to the existing learning approaches or that the cue-profiles form another level of the learning approaches. It would also be interesting to find out if the deep and the surface learning approach are correlating with the cue-profiles and if a learning approach predicts a certain cue-profile.

Concluding Remarks

The current study was conducted to renew the research of Miller and Parlett (1974) by finding the cue-profiles with a new questionnaire (the CPQ) measuring the underlying dimensions of the cue-profiles with the scales *metacognition*, *attitude*, *curriculum*, *cues*, *motivation performance* and *motivation mastery* (approach and avoidance). By performing factor and regression analyses it was hypothesized that a pattern could be found between the scales. Results of the MRA indicated that the predictors chosen after the factor analyses accounted for a significant proportion of variance in the dependent factor *cue-awareness*. The predictor *motivation mastery avoidance* in itself accounted for a significant proportion of variance.

Analyses of the data showed that the scales that were chosen for the CPQ were not valid as designed, indicating that the CPQ in itself may not be useful as an instrument in academic context. The interviews with the three participants however, showed some resemblance with the cue-profiles as they were found by Miller and Parlett (1974), which encourages further research on the subject of this study

In conclusion of the current study a new perspective on the old learning approaches from Miller and Parlett (1974) was given. The findings of this study were not conclusive about the cue-profiles, but the findings of this study can open up a new scope in the research on learning approaches. Future research can build upon this research to further explore the cue-profiles in both quantitative and qualitative studies and how they can be used in academic contexts.

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Appendix A: The Cue-Profile Questionnaire (CPQ)

Vragenlijst

Voor mijn bachelorthesis doe ik onderzoek naar hoe studenten hun studie benaderen en hoe ze leren. Om daarachter te komen is deze vragenlijst gemaakt. De resultaten van deze vragenlijst worden uitsluitend voor dit onderzoek gebruikt. De vragenlijst is anoniem, maar voor het vervolg van mijn onderzoek zou ik graag op basis van de resultaten nog contact op willen nemen voor een diepte interview ter bevestiging van de resultaten van deze vragenlijst.

Bij voorbaat dank!

Leeftijd:
Geslacht:
Studie:
Studiejaar:
E-mailadres (optioneel):

Geef aan in hoeverre de kwestie voor jou van toepassing is waar in de linkerkolom een vraag over wordt gesteld door op dezelfde regel nummer te omcirkelen dat het meest met uw mening overeenkomt. Al deze vragen gaan over studiegedrag en situaties op de universiteit.

Vraag	Mate van overeenstemming				
	Helemaal mee oneens	Beetje mee oneens	Geen mening	Beetje mee eens	Helemaal mee eens
1. Ik vind het belangrijk om hogere cijfers te halen dan anderen in de klas	1	2	3	4	5
2. Ik maak veel aantekeningen tijdens de colleges omdat ik niets wil missen	1	2	3	4	5
3. Voorafgaand aan het vak lees ik de leerdoelen van het vak door	1	2	3	4	5
4. Als ik boeken of artikelen moeten lezen voor mijn studie, dan lees ik deze globaal door	1	2	3	4	5
5. Ik vind het belangrijk dat de docent mij ziet als een goede leerling	1	2	3	4	5

6. Ik vind het belangrijk om hoge cijfers te halen	1	2	3	4	5
7. Als een docent een opmerking maakt over het tentamen, onthoud ik deze informatie zodat ik het kan gebruiken bij het leren van het tentamen	1	2	3	4	5
8. Het vooraf doorlezen van de cursushandleiding is voor mij belangrijk	1	2	3	4	5
9. Als ik boeken of artikelen voor mijn studie lees, dan lees ik deze nauwkeurig door	1	2	3	4	5
10. Ik doe mijn best om een goede indruk achter te laten bij de docent	1	2	3	4	5
11. Ik maak me wel eens zorgen of ik wel alles uit een vak heb gehaald wat ik eruit zou kunnen halen	1	2	3	4	5
12. De tips over het tentamen die tijdens een college worden gegeven, zijn bepalend voor wat ik leer voor het tentamen	1	2	3	4	5
13. Tijdens het studeren gebruik ik de leerdoelen van het vak zodat ik een overzicht krijg van de hoofdzaken	1	2	3	4	5
14. Ik plan het voorbereidingswerk voor mijn tentamen nauwkeurig	1	2	3	4	5
15. Het maakt mij niet uit of de docent mij ziet als een goede leerling	1	2	3	4	5
16. Soms ben ik bang dat ik de lesstof niet zo goed begrijp als ik zou willen	1	2	3	4	5
17. Als de docent feedback geeft op een paper, wil ik tot in detail weten wat de docent met de feedback bedoelt en wat er verbeterd kan worden	1	2	3	4	5
18. Voor het tentamen leer ik eerst de stof die in de colleges is behandeld en daarna pas de rest van de verplichte literatuur	1	2	3	4	5
19. Als ik een planning maak, houd ik me eraan	1	2	3	4	5
20. Ik ga graag in discussie met de docent over de lesstof	1	2	3	4	5
21. Het is voor mij belangrijk om de inhoud van wat ik leer op school zo goed mogelijk te begrijpen	1	2	3	4	5
22. Als de docent feedback geeft op een paper, pas ik niet alles aan volgens de feedback van de docent	1	2	3	4	5
23. Ik stel zo veel mogelijk vragen aan de docent om zo de hoofdlijn en belangrijkste	1	2	3	4	5

elementen uit de leerstof te kunnen achterhalen					
24. Ik merk vaak een verschil tussen de leerdoelen die in de cursushandleiding staan en de informatie die er in de colleges worden gegeven door de docent	1	2	3	4	5
25. Als ik mijn tentamen geleerd heb, controleer ik of ik echt alles heb geleerd	1	2	3	4	5
26. Ik denk dat als ik een goede indruk achterlaat bij de docent, dat ik ook een hoger cijfer zou kunnen halen voor een paper	1	2	3	4	5
27. Ik wil zo veel mogelijk van een vak leren als ik kan	1	2	3	4	5
28. Ik prefereer een docent die vertelt wat de belangrijke onderwerpen zijn op het tentamen	1	2	3	4	5
29. Als de docent feedback geeft op een paper, trek ik me daar niets van aan	1	2	3	4	5
30. Ik denk dat als ik een goede indruk achterlaat bij de docent, dat ik ook een hoger cijfer zou kunnen halen voor een tentamen	1	2	3	4	5
31. Ik wil gewoon vermijden dat ik slecht presteer in de klas	1	2	3	4	5
32. Als ik een tentamen heb gemaakt, ga ik altijd naar het inzagemoment	1	2	3	4	5
33. Wanneer ik naar het inzagemoment ga van een tentamen, kan ik altijd wel een puntje erbij sprokkelen	1	2	3	4	5
34. Mijn doel is om te voorkomen dat ik slecht presteer in de klas	1	2	3	4	5
Voor mijn laatste tentamen(s) heb ik het volgende cijfer gekregen:					
Voor mijn laatste paper(s)/essay(s) heb ik het volgende cijfer gekregen:					

-----Einde van de vragenlijst-----

Bedankt voor het invullen!

Appendix B: Piloted Questionnaire

Vragenlijst

Voor het vak Assessment & Evaluatie moeten wij, Anique, Sarah, Daniëlle en Anthea, een valide en betrouwbare test maken en afnemen. Onze vragenlijst gaat over hoe studenten hun studie benaderen en hoe ze leren. De resultaten van deze vragenlijst zijn anoniem en worden uitsluitend voor dit onderzoek gebruikt.

Bij voorbaat dank!

Leeftijd:
Geslacht:
Studie:
Studiejaar:

Geef aan in hoeverre de kwestie voor jou van toepassing is waar in de linkerkolom een vraag over wordt gesteld door op dezelfde regel nummer te omcirkelen dat het meest met uw mening overeenkomt. Al deze vragen gaan over studiegedrag en situaties op de universiteit.

Vraag	Mate van overeenstemming				
	Helemaal mee oneens	Beetje mee oneens	Geen mening	Beetje mee eens	Helemaal mee eens
1. Ik werk hard om hoge cijfers te halen	1	2	3	4	5
2. Ik leer extra stof naast de verplichte literatuur bij het voorbereiden van mijn tentamen	1	2	3	4	5
3. Wanneer ik iets niet begrijp, vraag ik om uitleg	1	2	3	4	5
4. Ik vind leren leuk	1	2	3	4	5
5. Het is voor mij belangrijk om de inhoud van wat ik leer op school zo goed mogelijk te begrijpen	1	2	3	4	5

6. Ik studeer omdat ik het interessant vind	1	2	3	4	5
7. Mijn voornaamste reden om te studeren is om meer zekerheid voor een baan biedt	1	2	3	4	5
8. Als een docent een opmerking maakt over het tentamen, onthoud ik deze informatie zodat ik het kan gebruiken bij het leren van het tentamen	1	2	3	4	5
9. Ik maak veel aantekeningen tijdens de colleges omdat ik niets wil missen	1	2	3	4	5
10. Tijdens het college ben ik blij als er tips gegeven worden voor het tentamen	1	2	3	4	5
11. De tips over het tentamen die tijdens een college worden gegeven, zijn bepalend voor wat ik leer voor het tentamen	1	2	3	4	5
12. Als de docent feedback geeft op een paper, wil ik tot in detail weten wat de docent met de feedback bedoelt en wat er verbeterd kan worden	1	2	3	4	5
13. Als de docent feedback geeft op een paper, pas ik niet alles aan volgens de feedback van de docent	1	2	3	4	5
14. Ik leer precies genoeg om een voldoende voor het tentamen te halen	1	2	3	4	5
15. Ik stel zo veel mogelijk vragen aan de docent om zo de hoofdlijn en belangrijkste elementen uit de leerstof te kunnen achterhalen	1	2	3	4	5
16. Ik prefereer een docent die vertelt wat de belangrijke onderwerpen zijn op het tentamen	1	2	3	4	5

17. Als de docent feedback geeft op een paper, trek ik me daar niets van aan	1	2	3	4	5
18. Voorafgaand aan de cursus lees ik de leerdoelen van de cursus door	1	2	3	4	5
19. Het vooraf doorlezen van de cursushandleiding is voor mij belangrijk	1	2	3	4	5
20. Tijdens het studeren gebruik ik de leerdoelen van de cursus zodat ik een overzicht krijg van de hoofdzaken	1	2	3	4	5
21. Ik zoek de essentie van de cursus door de collegesheets goed door te nemen	1	2	3	4	5
22. Tijdens het studeren controleer ik nauwkeurig wat ik heb gemaakt of gedaan	1	2	3	4	5
23. Ik lees de leerdoelen voorafgaand aan de cursus wel eens door, want ik vind dat belangrijk	1	2	3	4	5
24. Als ik boeken of artikelen voor mijn studie lees, dan lees ik deze nauwkeurig door.	1	2	3	4	5
25. Ik plan het voorbereidingswerk voor mijn tentamen nauwkeurig	1	2	3	4	5
26. Als ik een planning maak, houd ik me eraan	1	2	3	4	5
27. Als ik mijn tentamen geleerd heb, controleer ik of ik echt alles heb geleerd	1	2	3	4	5
28. Ik vind het belangrijk dat de docent mij ziet als een goede leerling	1	2	3	4	5

29. Ik doe mijn best om een goede indruk achter te laten bij de docent	1	2	3	4	5
30. Het maakt mij niet uit of de docent mij ziet als een goede leerling	1	2	3	4	5
31. Ik doe overdreven aardig tegen de docent, omdat ik het gevoel heb dat de docent mij dan meer of beter helpt	1	2	3	4	5

Appendix C: Topic list

1. Studiekeuze
 - a. Huidige studie
 - b. Toekomstige studie/ baan
2. Docenten
 - a. Mening
 - b. Indruk maken
 - c. Cijfers geven
 - d. Feedback krijgen
3. Tentamens
 - a. Voorbereiding
 - b. Toetsing
 - c. Routines
 - d. Cijfers
4. Toetsingsysteem

Appendix D – Independent Samples t Test For All Scales Per Gender

Group Statistics

	Geslacht	N	Mean	Std. Deviation	Std. Error Mean
Predictor Learning Accuracy	Man	9	2,593	1,1277	,3759
	Vrouw	41	3,398	1,1186	,1747
Predictor Outer Performance	Man	9	3,378	1,1065	,3688
	Vrouw	41	3,478	,7278	,1137
Predictor Failure Avoidance	Man	9	3,250	1,3636	,4545
	Vrouw	41	2,744	,9143	,1428
Predictor Student-Teacher Conversation	Man	9	2,389	1,0833	,3611
	Vrouw	41	2,207	1,0487	,1638
Predictor Learning Through Reading	Man	9	3,407	,8296	,2765
	Vrouw	41	3,439	,9323	,1456
Predictor Motivation Performance Approach	Man	9	3,000	1,2748	,4249
	Vrouw	41	3,232	,8667	,1354
Predictor Motivation Mastery Avoidance	Man	9	2,722	,7546	,2515
	Vrouw	41	3,049	1,0296	,1608
Dependent Cue-Awareness	Man	9	3,153	,4991	,1664
	Vrouw	41	3,217	,5802	,0906

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
		Predictor Learning Accuracy	Equal variances assumed	,007	,935	1,954	48	,057	-,8058	,4123
Equal variances not assumed				1,944	11,720	,076	-,8058	,4145	-1,7113	,0997
Predictor Outer Performance	Equal variances assumed	5,698	,021	-,339	48	,736	-,1003	,2958	-,6949	,4944

	Equal variances not assumed			-,260	9,574	,801	-,1003	,3860	-,9655	,7649
Predictor Failure Avoidance	Equal variances assumed	1,580	,215	1,370	48	,177	,5061	,3693	-,2364	1,2486
	Equal variances not assumed			1,062	9,638	,314	,5061	,4764	-,5609	1,5731
Predictor Student- Teacher Conversation	Equal variances assumed	,000	,985	,468	48	,642	,1816	,3882	-,5989	,9620
	Equal variances not assumed			,458	11,532	,656	,1816	,3965	-,6863	1,0494
Predictor Learning Through Reading	Equal variances assumed	,100	,753	-,094	48	,926	-,0316	,3372	-,7095	,6463
	Equal variances not assumed			-,101	12,852	,921	-,0316	,3125	-,7076	,6443
Predictor Motivation Performance Approach	Equal variances assumed	2,065	,157	-,665	48	,509	-,2317	,3486	-,9326	,4692
	Equal variances not assumed			-,520	9,686	,615	-,2317	,4460	-1,2297	,7663
Predictor Motivation Mastery Avoidance	Equal variances assumed	,620	,435	-,897	48	,374	-,3266	,3641	-1,0586	,4055
	Equal variances not assumed			- 1,094	15,361	,291	-,3266	,2985	-,9616	,3085
Dependent Cue- Awareness	Equal variances assumed	,606	,440	-,309	48	,759	-,0646	,2089	-,4846	,3554
	Equal variances not assumed			-,341	13,217	,739	-,0646	,1895	-,4732	,3440