

Master's Thesis Supervision

Feedback, interpersonal relationships, and adaptivity



Renske de Kleijn

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Master's Thesis Supervision

Feedback, interpersonal relationships, and adaptivity

De begeleiding van mastertheses

Feedback, interpersoonlijke relaties en adaptiviteit

(met een samenvatting in het Nederlands)

Proefschrift

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'Nou wat je goed moet beseffen denk ik is, ik vertoon kameleontisch gedrag als begeleider'

(Begeleider Tom)

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Chapter 1

Introduction and Research Overview

'I find a master's thesis project, well, your own little baby at the end of the programme. Something you can really put your heart and soul into, it's just yours only. And I find that important, that you can choose a topic based on your own passions and your own preferences. And well, also choosing your own direction in how to shape it.'

(Renee)

'Yes it seems like this is a big convergence of everything you have been doing before. So that is very exciting, that it is some kind of big assessment moment, so to say. But I also really look forward to it, that I can finally do something like that, and that in the end it will be mine.'

(Alice)

'I was quite angry with my supervisor, because I thought: do you really have to repeat that for three quarters of an hour, that it's not going well? Because I knew that all along. Do you want to make me cry, or what? [...] If you had asked me this three months ago, I would have said, very bad. I don't think I will ever finish it. I will die here as a fossil. That's what I would have said.'

(Nena)

'I have been very sad. This one time I went to a psychologist because eh, well someone just had to ask: how are you doing? And I thought: thesis, thesis! Well, from getting up until going to sleep I think about my thesis.'

(Andrea)

'We never really got guidelines for what a master's thesis should look like. If I look back, if I had known what the rules were exactly, it would have been far easier for me. Now it was really like giving birth.'

(Marlene)

These quotations come from students who were involved in writing a master's thesis. They illustrate elements of the opportunities and challenges that a master's thesis project can bring, which will be elaborated upon in this introduction.

1.1 Introduction

Most academic master's programmes consist of a substantial amount of coursework, sometimes an internship, and conclude with a master's thesis. In this dissertation, the focus is on the master's thesis, which can be characterised as an individual and often empirical research project that in most cases is the final piece of work to be done by a student before the master's programme is completed.

Therefore, the master's thesis is an important element both for students and teachers, as well as for academic institutions and society as a whole.

It is important to note that master's thesis projects are distinctively different from coursework in at least four ways: duration, focus, teacher–student interaction, and goals. First, in the Netherlands the *duration* of a master's thesis project is often at least half a year, whereas a course tends to last about three months. This longer duration results in the process being more cyclical than in general coursework as throughout this period students work on just one project, which they constantly elaborate and improve. The difference in duration is reflected in the weighting, with the thesis carrying a minimum weight of approximately 15 European Credit Transfer and Accumulation System Credits (ECTS) in contrast to a course which has a weight of 7.5 ECTS. Second, the *focus* of the research that is carried out in a master's thesis project is often determined to a large extent by the student, both in terms of topic and research design. This means that neither the student nor the supervisor know beforehand what the results of the project will be, which is often not the case for assignments in the context of a course. In addition, this leads to the student having substantive ownership over their projects. This is illustrated by the Renee's and Alice's comments quoted at the start of this chapter. Third, the *teacher–student interaction* in coursework can usually be characterised as one-on-many as often there will be one or two teachers and a large group of students. The teacher–student interaction in a master's thesis project, on the other hand, can be characterised as one-on-one. Even though explorations with group supervision are described in the literature (e.g., Dysthe, Samara, & Westrheim, 2006; Fenge, 2012), one-on-one supervision still seems to be the most common form of master's thesis supervision. Fourth, in coursework there is often a clear distinction between assignments that are intended to support learning (for instance, assignments during tutorials) and assignments that are intended to assess learning (that is assignments that are graded). The master's thesis, however, has the *goal* of both supporting and assessing student learning, which can be seen as rather complex (Todd, Bannister, & Clegg, 2004). Also, for supervisors this means that they should support students in their learning process, but in the end also assess the quality of the thesis.

These characteristics of master's thesis projects imply several *opportunities*. For instance, the fact that the master's thesis has a longer duration affords the possibility of creating a research project in greater depth than would be possible in a shorter period of time. Also, the fact that students can to a great extent choose the topic and design of their study provides them with the opportunity to match their research to their intrinsic interests. Lastly, the one-on-one interaction between supervisor and student provides supervisors with the opportunity to provide tailor-made supervision that matches a student's needs. Sometimes students are even in the position that they themselves can choose their supervisor. Some of these opportunities are illustrated in the quotes from Renee and Alice at the start of this chapter.

The characteristics of master's thesis projects also give rise to several *challenges* for both students and supervisors. Often there is a lack of a clear deadline for when a thesis should be finished or clear indicators of when a thesis is finished (for example, see Marlene's comment at the start of this chapter). This can lead to students extending their studies. Doing so is complicated as at the same time there is increasing pressure in the Netherlands to graduate within time due to upcoming governmental policy that stops student grants for master's programmes and might even introduce student and institutional fines in cases of delay (Bussemaker, 2013). Also, the fact that students individually can determine the focus of their thesis to a large extent, for some students the master's thesis is a mythical entity that can lead to feelings of insecurity or even inferiority (Ylijoki, 2001). This is indicated by Nena, who at some point had no faith that she would ever finish her thesis (see quote at the start of this chapter). In addition, concerning the teacher–student interaction, supervisors are often not trained or supported in supervising students in a one-on-one situation and therefore base their supervision on their own experiences as a supervisee (Delamont, Parry, & Atkinson, 1998; Lee, 2008; Marsh, Row, & Martin, 2002; Pearson & Brew, 2002; Philips & Pugh, 2005; Todd, Smith, & Bannister, 2006). Lastly, regarding the complex goals of both supporting and assessing learning, it can be unclear what the task/responsibility of the supervisor is and what the task/responsibility of the student is, as reflected in Marlene's comment.

Despite the prominent place of the master's thesis in most master's curricula and its specific, studies concerning master's thesis projects are scarce, indicating that what we know about these projects in general and supervision processes more specifically is limited. In her dissertation, Joy de Jong (2006) studied all master's thesis supervision meetings between four students and their supervisor in depth, using conversation analysis to look at interaction patterns in terms of the efficiency of the interaction. She concluded that the interaction in the conversations was not always optimal as student and supervisor regularly did not understand each other or did not come to agreement because of unclear use of language and the fact that they were communicating from different frames of reference. She indicated that to further elaborate on her findings, studies would be needed that also included student perceptions and evaluations and supervisor considerations: this study does just that, predominantly through student questionnaires and supervisor and student interviews.

The main aim of this dissertation is to *provide insight into the quality of master's thesis supervision*. Such insight could help to support three stakeholders in particular: (1) *supervisors* in establishing supervision quality and providing input for individual professionalization; (2) *institutions* as a whole by providing insight into possible preconditions for establishing quality in supervision and providing suggestions for supervisor professionalization; (3) *students* with how they can contribute to the quality of their master's thesis supervision.

The focus of this dissertation is on master's thesis projects in which students work on their thesis individually with weekly to monthly supervision meetings with their supervisor. This is different from master's thesis projects that include experiments in a laboratory, for example, in which supervisors and students see each other on a daily basis.

1.2 Theoretical framework

Quality of master's thesis supervision

In order to investigate the quality of the supervision process, it needs to be clear what represents 'quality', or in other words what measures are taken into account in this dissertation for evaluating the supervision process. In other studies, a wide variety of measures are used: output-focused, student-focused, and interaction-focused. Examples of output-focused measures are time to complete (Seagram, Gould, & Pyke, 1998) and number of publications (Martinsuo & Turkulainen, 2011). Related to such measures, Hamilton, Johnson and Poudrier (2010) contend that in establishing the educational quality of research projects, a danger is that students' prior knowledge and pre-existing attributes, such as verbal ability or intelligence, can be mistaken for educational effectiveness. Therefore, it is argued that the issue of previous achievement might need to be taken into account when measuring educational quality using such measures. Student-focused measures relate to such considerations as student satisfaction (Kam, 1997; Armstrong, 2004), perceived research skill development (Drennan & Clarke, 2009) and student well-being (Nelson & Friedlander, 2001; Pyhältö, Stubb, & Lonka, 2008). By using less objective measures, the issue of prior achievement is less of an issue. Lastly, de Jong (2006) used an interaction-focused measure in terms of the efficiency of the interaction between a supervisor and student. Interestingly, these authors do not explicitly touch upon the possible use of supervisor-focused measures, such as those looking at supervisor satisfaction. This might be due to the fact that the main goal of education is that it affects the student and not the teacher in the first place, and that therefore student evaluations are considered more important.

In terms of the issue of including output-, student- and/or interaction-focused measures, multiple positions can be taken with respect to *who* evaluates these measures. For instance, the process can be evaluated by the student by using student satisfaction as a measure of quality of supervision, but also the supervisors could be asked to estimate their student's satisfaction with the process. Also, the quality of the final master's thesis could be judged by the supervisor, a second and independent assessor, or a researcher; this judgment could be corrected for students' previous achievement. Lastly, at an institutional level, supervisors with a good reputation can be studied (e.g., Anderson, Day, & McLaughlin, 2006). Kam (1997) argued that the effectiveness of research supervision could best be judged by those involved, i.e. the students, as they are in the best position to judge the supervision project. Also, Price, Handley, Miller and O'Donovan (2010), in discussing the effectiveness of feedback, argued that students are most capable of determining its effectiveness. However, they do acknowledge that students might not always recognise the benefits of feedback for their learning.

In relation to this discussion, the position taken in this dissertation is that there is no one best measure as an indicator of the quality of supervision. Therefore, this dissertation used multiple measures to evaluate the quality of the supervision process in order to understand it. Variables from a student and an institutional point of view were included. The first measure from a student point of view used as an indicator of quality of supervision was student satisfaction with the supervision. In addition, the contribution of a supervisor to a student's learning is approximated. Therefore, student perceptions of the extent to which the supervision has contributed to their learning are included, as

these measures is not expected to be influenced by the pre-existing attributes of students. A third way of including the students' point of view on quality of supervision was to approach supervisors who had been nominated by their students for the best young teacher award to participate. However, it is important to note that this nomination is about teaching in general and not about supervision specifically. Fourth, from an institutional point of view, data are collected from and with supervisors who had a local reputation of being good supervisors and were indicated as such by the deans of their educational programmes. Using these different strategies for approaching the quality of master's thesis supervision implies a more nuanced view on quality of research supervision and aims to do justice to the complexity of the outcomes of supervision processes.

Two perspectives on master's thesis supervision

In order to understand the quality of the supervision process, it can be investigated from several perspectives, including social-emotional perspectives, such as the degree of student gratitude and trust (e.g., Unsworth, Turner, Williams, & Piccin-Houle, 2010) and the quality of the supervisor–student relationship (e.g., Nelson & Friedlander, 2001), or cognitive perspectives, such as the type of discourse between a supervisor and a student (e.g., de Jong, 2006; Vehviläinen, 2009) and the nature of the feedback that is provided by a supervisor (e.g., Pyhältö, Stubb, & Lonka, 2008). Most studies aiming to understand the process of research supervision view supervision from only one of these perspectives. However, arguably, in order to gain a more comprehensive understanding of the quality of supervision processes, more than one perspective would be needed. Therefore in this dissertation, both a social-emotional perspective (i.e. supervisor–student relationship) and a cognitive perspective (i.e. feedback) are included to understand the supervision process as both have been found to be important in research supervision (Anderson, Day, & McLoughlin, 2008; Brown & Atkins, 1989; Dysthe, Samara, & Westrheim, 2006; Hasrati, 2005; Li & Seale, 2007; Nelson & Friedlander, 2001; Philips & Pugh, 2005).

Social-emotional perspective: supervisor–student relationship

Given the highly personalised nature of the one-on-one interaction and long duration of a master's thesis project, the supervisor–student relationship is an inevitable part of research supervision. Nelson and Friedlander (2001) investigated student problems in conflictual supervisory relationships. These students reported, among other things, being overworked, undergoing extreme stress and experiencing self-doubt, as well as developing health problems. Furthermore, Halse and Malfroy (2010) found that supervisors consider a positive personal relationship with their students important, indicating that supervisors also highly value the supervisor–student relationship.

In this dissertation the supervisor–student relationship is conceptualised based on interpersonal theory, which claims that two dimensions underlie all social behaviour (e.g., Fiske, Cuddy, & Glick, 2006; Judd et al., 2005). In the context of research supervision, based on the model for interpersonal teacher behaviour (Wubbels, Créton, & Hooymayers, 1985), these two dimensions can be described as the amount of *control* and *affiliation* a supervisor conveys, according to the student (e.g., Kiesler & Auerbach, 2003; Tiedens & Fragale, 2003). The control dimension describes the extent to which a supervisor influences the student's activities; the affiliation dimension describes the emotional

distance or interpersonal proximity between a supervisor and a student. Interpersonal circumplex models (Leary, 1957) represent how all possible behaviours relate to the two dimensions (e.g., Brekelmans, Mainhard, Den Brok, & Wubbels, 2011; Kiesler & Auerbach, 2003; see Figure 1.1). For example, friendly behaviour can be characterised as high on affiliation and moderately high on control. On the other hand, uncertain behaviour can be characterised as moderately low on affiliation and low on control.

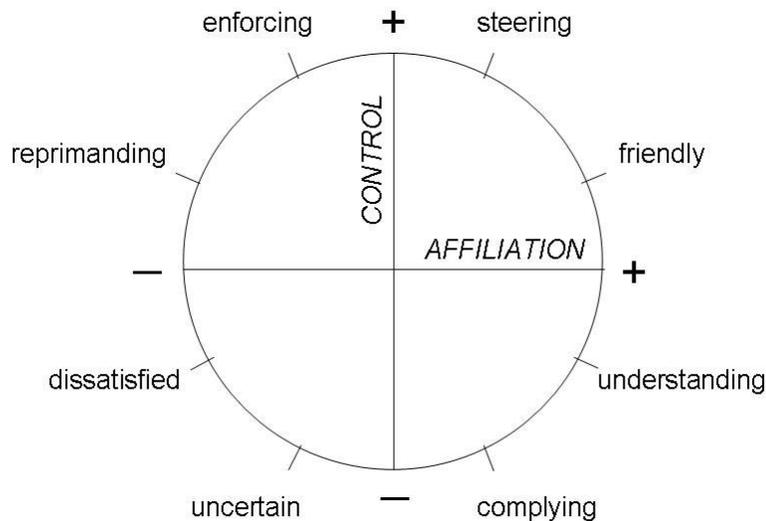


Figure 1.1 Interpersonal circumplex with the dimensions Control and Affiliation (adapted from Brekelmans, Mainhard, Den Brok, & Wubbels, 2011)

Cognitive perspective: feedback

According to students, one of the most important tasks of a research supervisor is to provide constructive feedback (Todd, Bannister, & Clegg, 2004). Also, Pyhältö, Stubb, and Lonka (2008) found that students who were more satisfied with the supervisor feedback reported less stress, exhaustion and anxiety as a result of their thesis project.

Examples of well-known and often used definitions of feedback are: ‘information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one’s performance or understanding’ (Hattie & Timperley, 2007, p.81); ‘information communicated to the learner that is intended to modify his or her thinking or behaviour for the purpose of improving learning’ (Shute, 2008, p.154); ‘information about the gap between the actual level and the reference level of a system parameter which is used to alter the gap in some way’ (Ramaprasad, 1983, p.4). These three definitions have in common that feedback concerns a certain type of *information*. However, they also illustrate that definitions of feedback can include *what* this information *is about* (e.g., ‘aspects of one’s performance or understanding’ or ‘the gap between the actual level and the reference level of a system parameter’), what is *intended* with this information, thereby taking a sender’s position (e.g., ‘modify his or her thinking or behaviour for the purpose of improving learning’), and what is *done* with this information, thereby taking a receiver’s position (e.g., ‘use to alter the gap in some way’). Thus,

conceptualizations can include a specification of what type of information is provided and from what specific position feedback is approached. This dissertation opts to provide a general conceptualization of feedback, namely that feedback is about a specific type of information, without choosing a specific position from which this information is operationalised. This conceptualization is: *feedback is information about a student's performance and/or understanding in the context of a task*. Secondly, it can be identified in terms of the position from which this information is operationalised. First, feedback can be operationalised from a sender's/teacher's position: feedback is information about a student's performance and/or understanding in the context of a task that is *intended* to support student learning and/or performance. Second, feedback can be operationalised from a receiver/seeker/student position: feedback is information about a student's performance and/or understanding in the context of a task that a student *perceives* or *uses* to support their learning and/or performance. Third, feedback can be operationalised from the position of an external observer: feedback is information about a student's performance and/or understanding in the context of a task that is *(non)verbally communicated* from a provider to a receiver. It is deemed important to be clear about what position is taken with regard to operationalising feedback, as intended feedback might not be recognised as such by students; vice versa, information that was not intended as feedback can be perceived as such by students. Thus, this dissertation advocates a general conceptualization of feedback in combination with a clear operationalization of what position is taken.

In most studies that are described in this dissertation, feedback is approached from a receiver/student position. In order to determine what elements of feedback perceptions to investigate, research findings from an observer position were used as a point of departure. Findings from two review studies from an observer position were combined (Hattie & Timperley, 2007; Shute, 2007) with respect to what feedback messages are effective in terms of student learning and improved performance. Thus student perceptions of elements of feedback messages that were found to be effective are investigated because it can be assumed that student perceptions of feedback mediate the relation between the actual feedback message (observer point of view) and student outcomes (Shuell, 1996). Based on the review studies three elements of effective feedback messages are discerned that were used to investigate feedback perceptions: focus, elaboration and goal-relatedness.

First, the *focus* of feedback concerns the aspect of performance to which the feedback draws the recipient's attention. Hattie and Timperley (2007) discerned four levels: task, process, self-regulation and self. Both the meta-analyses of Kluger and DeNisi (1996) and Hattie and Timperley (2007) and the review findings of Shute (2008) found that feedback should be focused on the task and the process, rather than on the learners themselves. Second, Shute (2008) found that feedback should be *elaborated* in terms of the what, how and why of students' work. First, the *what* of feedback is the extent to which a performance is correct, i.e. the verification component. Second, the *why* describes the rationale behind whether or not a given performance is of a sufficiently high standard, i.e. the explanation component. Third and most importantly, feedback should provide strategies for *how* the current performance can be improved, i.e. the strategic hints component (Shute, 2008). Third, one of the most important functions of feedback is to be *goal-related* or to guide students in reducing the discrepancy between their current performance and a goal (Hattie & Timperley 2007; Sadler 1989; Shute 2008). Sadler argued that in order to improve their work, learners have to understand what the

standards and goals are, to compare their actual level of performance with those standards and goals, and to act in order to close the gap between their actual performance and the aforementioned standards and goals.

1.3 Research questions and overview of the chapters

Based on the problem defined and the theoretical framework, the main research question of this dissertation is: *How can quality in master's thesis supervision be understood from a feedback perspective and an interpersonal perspective?*

In order to answer this research question, seven studies were conducted and these are reported in individual chapters as outlined below.

In **Chapter 2** student perceptions were investigated from a feedback perspective, addressing the research question: *How do students perceive supervisor feedback in terms of focus, goal-relatedness, and elaboration and how are feedback perceptions related to student satisfaction and perceived supervisor contribution to learning?* Data were gathered by means of a newly developed instrument called the Questionnaire on Feedback Perceptions. Structural equation modelling techniques were applied to questionnaire data from 1016 students from the Humanities, Geosciences and Social and Behavioural Science faculties of Utrecht University.

In **Chapter 3** student perceptions were investigated from an interpersonal perspective, addressing the research question: *How do students perceive supervisor control and affiliation and how are these perceptions related to student satisfaction and perceived supervisor contribution to learning?* Data were gathered by means of the Questionnaire on Supervisor Interaction (Mainhard et al., 2009). Structural equation modelling techniques were applied to questionnaire data from 401 students from the Humanities, Geosciences and Social and Behavioural Science faculties of Utrecht University.

In order to explore the relation between feedback perceptions and interpersonal perceptions in predicting student satisfaction and perceived supervisor contribution to learning, **Chapter 4** addresses the following research question: *How are student perceptions of feedback and of the supervisor–student relationship related to student satisfaction and perceived supervisor contribution to learning in the context of master's thesis supervision?* In total, 1016 students completed both the Questionnaire on Feedback Perceptions and the Questionnaire on Supervisor Interaction and regression analysis exploring interaction effects between both perspectives was undertaken to analyse the data.

In order to gain a more in-depth understanding of the goal-relatedness of feedback, in **Chapter 5** both student and supervisor views on master's thesis projects were investigated. The guiding research question was: *What goals do supervisors and students describe in master's thesis projects and what are the main similarities and differences between supervisors and students?* In order to answer this question, interviews with supervisors and students in twelve supervision dyads were conducted. Transcripts were analysed using the Dublin descriptors (2003) and the Ford and Nichols taxonomy of human goals (1991, 2001).

Based on the findings of the earlier studies, **Chapter 6** aims to provide more insight into how supervisors and students view goal-relatedness in master's thesis projects. The accompanying research question was: *How do expert master's thesis supervisors describe to create goal-relatedness in their supervision and according considerations, and how is this perceived by their students?* The interviews with supervisors and students in the twelve supervision dyads were analysed by investigating the overarching theme of 'adaptivity' that emerged from the interviews and concurrent tensions that were described by supervisors and students in relation to the goal-relatedness of supervision.

Elaborating the findings of Chapter 6, the notion of establishing goal-relatedness in research supervision by providing adaptive supervision is further explored in **Chapter 7**. This study involved two group discussion meetings and individual interviews with five expert thesis supervisors. The following research question was addressed: *What is expert thesis supervisors' practical knowledge about providing adaptive supervision?* These data were analysed both during and after the data collection by using student types to explore supervisor's diagnosis of student characteristics and accompanying adapted support.

Lastly, in **Chapter 8** the conclusions of the individual studies are summarised and an integrated conclusion with respect to the main research question is provided. The contributions of the studies to feedback theory, interpersonal theory, adaptivity theory, and conceptualising the quality of research supervision are described. In addition, the limitations of the studies are discussed in terms of conceptualizations and methodological issues, as well as suggestions for further research. Lastly, the practical implications of the findings for supervisors, institutions and students are presented.

Figure 1.2 gives the timeline of the data collection. In addition, Figure 1.3 presents an overview of the different studies and their theoretical perspectives in terms of approaching supervision and points of view for conceptualising quality of supervision.

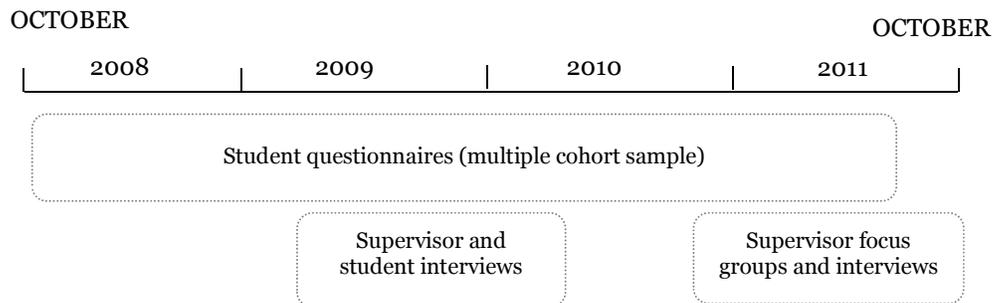


Figure 1.2 Time line of data collection.

Quality of supervision

Perspectives on master's thesis supervision

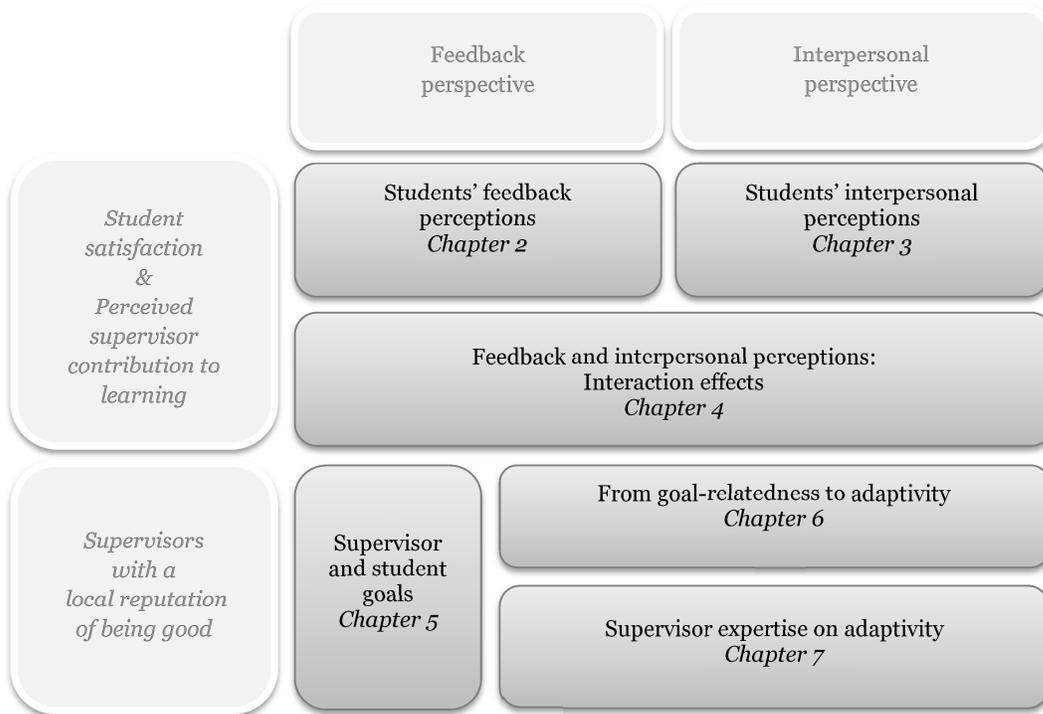
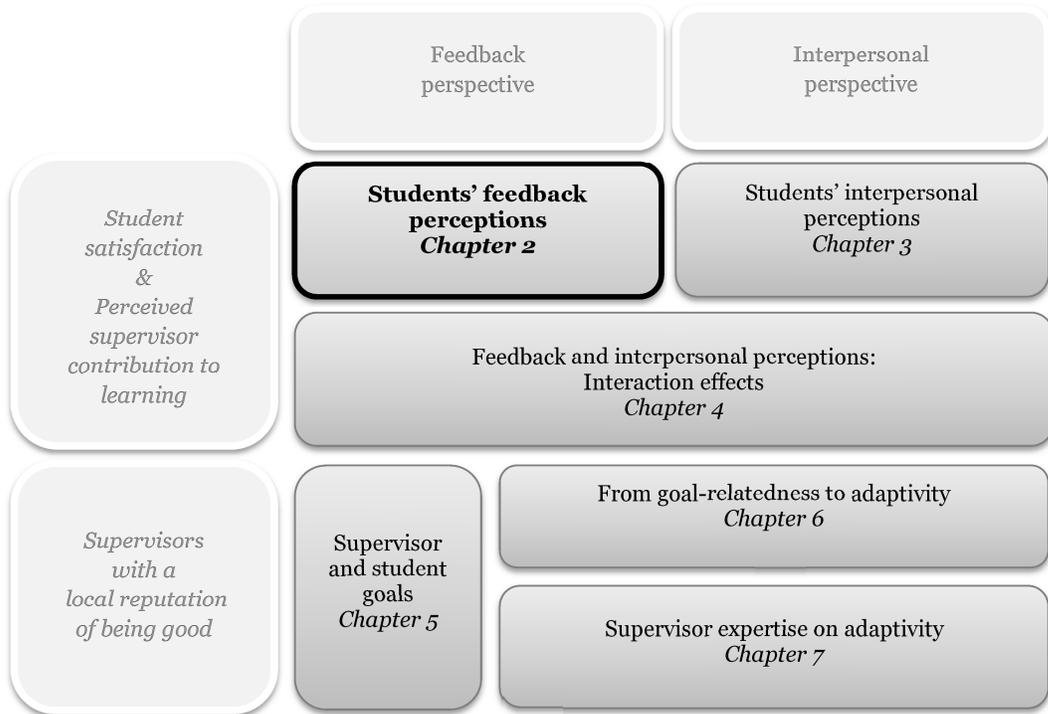


Figure 1.3 Overview of the individual studies that were performed along with the theoretical perspectives on supervision and point of views on quality of supervision.

Quality of supervision

Perspectives on master's thesis supervision



Chapter 2

Students' feedback perceptions ¹

A growing body of research has investigated student perceptions of written feedback in higher education coursework, but few studies have considered feedback perceptions in one-on-one and face-to-face contexts such as master's thesis projects. In this paper, therefore, student perceptions of feedback are explored in the context of the supervision of master's thesis projects, using review studies with respect to effective feedback in coursework situations. Online questionnaires were administered to collect data from three cohorts of master's students that were either working on their thesis or had recently finished it ($N=1016$). The results of the study indicate that students perceive the focus of feedback in terms of a focus on task and self-regulation; they perceive the goal-relatedness of feedback in terms of feed up (goal-setting) and feed back-forward (How am I going and where to next?); and elaboration of feedback is perceived in terms of positive and negative feedback. Furthermore, students that perceive the feedback to be positive and to provide information on how they are going and what next steps to take are most satisfied with their supervision and perceive learning most from their supervisor. Findings are discussed in relation to findings in coursework settings and are explained using goal orientation theories.

¹ This chapter is based on Kleijn, R.A.M., Mainhard, M.T., Meijer, P.C., Meijer, Brekelmans, M., & Pilot, A. (*in press*). Master's thesis projects: student perceptions of supervisor feedback. *Assessment & Evaluation in Higher Education*. DOI:10.1080/02602938.2013.777690

2.1 Introduction

Studies in higher education repeatedly find that feedback practices are far from optimal, often describing problems such as students misinterpreting feedback, not recognising the possible benefits of feedback, or not acting upon feedback (e.g., Carless, 2006; Chanock, 2000; Hyatt, 2005; Orrell, 2006; Price et al., 2010; Weaver, 2006). Most of these studies investigated feedback in coursework settings (Caffarella & Barnett, 2000; Carless, 2006; Ferguson, 2011; Hyatt, 2005; Orrell, 2006; Orsmond & Merry, 2011; Price, Handley, Millar, & O'Donovan, 2010). However, next to coursework, feedback plays an even more important role in the final piece of work in most master's programmes, which is writing a master's thesis. As will be discussed below, the process of writing a thesis is distinctively different from doing coursework in several respects that might lead to fundamentally different feedback processes.

Feedback in master's thesis projects

A master's thesis project can be characterised by three elements in which it differs distinctively from general coursework: the *duration* of the project, the individual nature of the *supervision*, and the complexity of the *goals*. First, in the Netherlands the duration of a master's thesis project is often at least half a year, with a weight of about 15 European Credit Transfer and Accumulation System Credits (ECTS), whereas a course often lasts about three months with a weight of 7.5 ECTS. Several studies in higher education have indicated that students in general find that feedback could be more helpful (e.g., Weaver, 2006) and students do not use feedback to improve their future work (e.g., Walker, 2009). The main reason for this, argue Gibbs and Simpson (2004), is that students are often provided with feedback when it does not matter to them anymore, i.e. when they have already received their grade, and not in time for them to pay attention to further learning or receive further assistance.

The second element specific to the master's thesis is related to this cyclical process, namely the fact that the interaction between supervisor and student is one-on-one and mostly also face-to-face. Mostly, students have chosen or are assigned to a supervisor with whom they usually have face-to-face supervision meetings on a regular basis in addition to communication via email. Nicol (2010) emphasises the importance of framing feedback as a dialogue rather than a monologue, in which 'feedback should be conceptualised as a dialogical and contingent two-way process that involves coordinated teacher-student and peer-to-peer interaction as well as active learner engagement' (p.503). He argues that findings of student dissatisfaction with written feedback can be signs of an impoverished dialogue. For the master's thesis, however, the fact that supervisor and student have supervision meetings, and that the given or requested feedback can actually be discussed, provides lots of opportunities for creating a two-way feedback dialogue. This is also, for instance, the case in situations in which students produce concrete work (such as an architectural design or other pieces of art) and receive face-to-face, one-on-one and cyclical feedback on their work. This study, therefore, might also have implications for situations such as these, but possible resemblances and differences would need to be investigated first. Also, it should be noted that in some universities supervision of master's theses takes place in groups of two or more students (e.g., Dysthe, Samara, & Westrheim, 2006). In the present study we focus on one-on-one situation solely.

Thirdly, unlike coursework, the goals of a master's thesis project are often complex. In general, the educational goal of a master's thesis is often twofold in that it has a learning goal and a performance goal (Todd, Bannister, & Clegg, 2004). Also, self-determination has been labelled the ultimate goal of a master's thesis (Sachs, 2002). The complexity of goals is also related to the fact that students, to a large extent, can individually choose the topic and design of their study, whereas in coursework the content to be learned is often predetermined and highly structured. This often means that there is room for student creativity and thus neither the student nor the supervisor know what the research findings and conclusions will be. Cowdroy and de Graaff (2005) indicated that creative ability is difficult to assess, which may also have consequences for the feedback process. For instance, it could happen that a supervisor provides certain feedback (e.g., 'this information is not needed in the theoretical framework of your thesis'), but later in the process, based on possible surprising findings, provides the opposite feedback (e.g., 'given these findings you would need to include this information in your theoretical framework after all'). This can create tensions in the feedback process as previous studies in higher education have indicated the importance of clear goals and expectations in a feedback process (Carless, 2006; Hyatt, 2005). Moreover, psychological research has indicated that negative feedback can diminish creative behaviour (e.g., Fodor & Carver, 2000; Zhou, 1998), indicating that feedback in situations in which creativity is appreciated might function differently from situations in which it is more a matter of reaching clear-cut goals.

Thus, the master's thesis can be considered to be distinctively different from coursework, likely leading to different mechanisms in the feedback process (a cyclical process, with more opportunities for in-depth dialogue, with complex goals). However, despite the obvious and important role of feedback in master's thesis projects, studies that have investigated feedback in higher education in such one-on-one and face-to-face context are scarce. The present study therefore aims to explore feedback perceptions in master's thesis projects.

A student perspective on feedback

Feedback processes can be investigated from at least four perspectives: the sender's perspective, the seeker/receiver's perspective, a relational perspective (both sender and seeker/receiver) and/or an observant perspective. Recently in higher education a shift seems to have been taking place from a focus on the senders and their intentions with the feedback to the seekers/receivers and their preferences and actions (e.g., Orsmond & Merry, 2011). This shift underpins our view that students should be active agents in the feedback process; that is, teachers can provide very constructive and possibly helpful feedback, but when students do not process it or act upon it, feedback is unlikely to lead to learning. Therefore, in the present study a student perspective is taken. From the student perspective, the first process that takes place is that the student *perceives* the feedback before even accepting and acting upon it (Ilgen, Fisher, & Taylor, 1979). From studies in other contexts we know that student perceptions are an important mediator for the relation between teacher activities and student outcomes (Shuell, 1988). Recently, several studies in higher education have investigated student perceptions of feedback (e.g., Carless, 2006; Chanock, 2000; Kumar & Stracke, 2007; Lizzio & Wilson, 2008; Orsmond & Merry, 2011; Poulos & Mahony, 2008; Weaver, 2006). In investigating feedback perceptions Orsmond and Merry (2011) included what students perceive to be feedback (see

also Poulos & Mahony, 2008), the perceived effectiveness of feedback (Poulos & Mahony, 2008) and the usefulness of feedback (Carless, 2006; Kumar & Stracke, 2007; Weaver, 2006). In addition, Chanock (2000) included students' understanding of feedback. In the present study, following the influential work of Ilgen, Fisher and Taylor (1979) in the field of feedback, we distinguished the perception of feedback from the acceptance and judgment of feedback. Feedback perceptions are thus concerned with how a learner perceives the feedback, which is assumed to be influenced by the feedback message, characteristics of the feedback provider and the frame of reference of the feedback receiver (Ilgen, Fisher, & Taylor, 1979). The students' acceptance and judgment of the feedback are addressed by also measuring the two process quality measures of student satisfaction with the supervision and the extent to which students perceive their supervisor as contributing to their learning. Therefore, we distinguish the feedback perception from the feedback judgment.

Exploring student perceptions of feedback

Compared with studies in higher education, an overwhelming body of research has studied the content of feedback in classroom settings in secondary education. Because we want to build on what is already known about feedback, we used the findings of two recent and influential review studies (Hattie & Timperley, 2007; Shute, 2008) in the context of classroom settings as a basis for conceptualising feedback perceptions in the present study. In summary, Hattie and Timperley (2007) describe feedback in terms of level, which we refer to as focus, and feed up (where am I going?), back (how am I going?) and forward (where to next?) which we summarise as goal-relatedness. Shute (2008) adds feedback elaboration to that. Therefore, these three elements of feedback are investigated in the present study.

First, the *focus* of feedback concerns the aspect of performance to which the feedback draws the receiver's attention. Kluger and DeNisi (1996) in their meta-analysis described three hierarchical levels of focus: task learning, task motivation and meta-tasks. Hattie and Timperley (2007) discerned four levels: task, process, self-regulation and self. Both the meta-analyses of Kluger and DeNisi (1996) and Hattie and Timperley (2007) and the review findings of Shute (2008) indicated that in order to support student learning, feedback should be focused on task and process, rather than on the learners themselves.

Second, one of the most important functions of feedback is guiding students in reducing the discrepancy between their current performance and a goal (Hattie & Timperley, 2007; Sadler, 1989; Shute, 2008). Sadler argued that, in order to improve their work, learners have to understand what the standards and goals are, compare their actual level of performance with those standards and goals, and act in order to close the gap between their actual performance and the aforementioned standards and goals. In line with this, Hattie and Timperley (2007) state that feedback should answer the following three questions: where am I going (feed up), how am I going (feed back) and where to next (feed forward)? We can thus say that in order to support student learning, the content of feedback should be *goal-related*.

Third, Shute (2008) concluded that feedback should be *elaborated*, by which she means the explanation and underpinning of the feedback in terms of the what, how and why of students' work. The 'what' is the extent to which a performance is correct (i.e. the verification component). The 'why'

describes why a given performance has reached the standard or not (i.e. the explanation component). But most importantly, feedback should provide strategies for 'how' the current performance can be improved, i.e. the strategic hints component. Thus, in order to support student learning, feedback should contain this type of information to help students to evaluate the quality of their work, and can provide a starting point for improving their performance.

We therefore see that focus on task, process and self-regulation, goal-relatedness and elaboration of feedback are found to be important in classroom situations. In the present study, we explore whether these are also important elements of student perceptions of feedback in one-on-one and face-to-face situations such as the master's thesis, as we know student perceptions are an important mediator between teacher activities and student outcomes (Shuell, 1988).

Study aim and research questions

Given the highly personalised nature of research projects such as the master's thesis (in terms of topic, goals, supervisor, etc.), student satisfaction with supervision is considered to be an important process quality measure (e.g., Kam, 1997). Furthermore, we assume that students can gain a variety of learning outcomes from master's thesis projects. Therefore, we use perceived supervisor contribution to learning as a proxy measure for student learning that might be attributed to the supervisor (de Kleijn, Mainhard, Meijer, Pilot, & Brekelmans, 2012).

The present study addresses the following research questions:

- (1) *What feedback content (in terms of focus, elaboration and goal-relatedness) do students perceive they receive from their supervisor in master's thesis projects?*
- (2) *What factors underlie these student perceptions?*
- (3) *How are these factors related to student satisfaction with supervision and perceived supervisor contribution to learning?*

The most important contributions of this study will be (a) a theoretically and empirically underpinned framework for student perceptions of feedback, (b) insight into how students perceive feedback in the one-on-one and face-to-face context of the master's thesis, and (c) insight into what feedback perceptions are beneficial for student satisfaction with supervision and perceived contribution of the supervisor to student learning.

2.2 Methods

Participants and procedure

The target population included three cohorts of students (2009-11) who were involved in writing their academic master's thesis within the departments of Social and Behavioural Sciences, Geosciences and Humanities at a large Dutch research university. All of the students enrolled in a one-year master's programme in one of these departments received an email between November 2008 and June 2011 with a link to the online questionnaires. Participation was on a strictly voluntary and anonymous basis.

We collected 1016 completed online questionnaires. As privacy legislation of the university would prescribe that online questionnaires are distributed by administrators rather than researchers and as we had no information about the number of emails that were sent out, no accurate response rate could

be calculated. Therefore, based on the completion rates of the included departments (average number of students who graduate from the departments), we estimated the response rate of the questionnaire to be about 30%. Most students were female (77%), which is in line with the gender ratio of the departments involved. The students were between 20 and 65 years old ($M=25.0$, $SD=5.0$). At the time of completing the questionnaire, 15% of the students had recently finished their thesis and the other 85% were still working on it.

Instrumentation

In order to map the students' feedback perceptions, a questionnaire was developed with items concerning feedback focus ($N=8$), goal-relatedness ($N=9$) and elaboration ($N=6$) (see Table 2.1 for an overview). In the pilot phase, 12 think-aloud interviews were conducted. From the results of these interviews, final items for the questionnaire were crafted. Students who participated in the pilot study were not included in the final sample. Items were statements that had to be rated on a five-point Likert-type scale ranging from 1 = '(almost) never' to 5 = '(almost) always'.

To measure the two outcome measures a different set of seven questions was used (see Table 2.2). Student satisfaction with supervision (SSS) was measured by asking the students to indicate their level of satisfaction on two items on a seven-point scale, which were combined into one scale: satisfaction with their supervisor and satisfaction with the supervisor feedback ($r=.81$; $M=5.23$; $SD=1.51$). Five items were used for mapping perceived supervisor contribution to learning (PSCL); on four items, students indicated the extent to which the supervision meetings had contributed to their understanding of the task, and on one item students indicated how much they had learned from the supervisor feedback ($\alpha=.89$; $M=3.52$; $SD=0.86$).

Analysis

In order to investigate the underlying structure in student perceptions of supervisor feedback in terms of focus, goal-relatedness and elaboration, exploratory factor analyses were run on the 23 feedback items. We used a maximum likelihood (ML) estimation with an Oblimin rotation, and the scree plot for determining the number of factors, as recommended by Costello and Osborne (2005). An exploratory factor analysis with ML estimates the level of shared variance (communalities) for the items, which leads to the solution being more generalizable and reproducible than by using principal component analysis, because it does not inflate the variance estimates. An oblique rotation (such as Oblimin) will reproduce an orthogonal solution but not vice versa. Further, items with factor loadings above .40 were used for interpreting and labelling the factors (Stevens, 1992). Next, standardised factor scores were computed based on the Bartlett method. This method produces rather unbiased estimates, as it uses maximum likelihood estimation and produces high-validity estimates between the factor scores and the factor (DiStefano, Zhu, & Míndrila, 2009).

In order to investigate the relationship between student perceptions of feedback and the process quality measures SSS and PSCL, a structural equation model was fitted with the feedback perception factors predicting the process quality measures with Mplus (Muthén & Muthén, 1998). In order to evaluate the model fit, the following fit indices were inspected: chi square, comparative fit index (CFI; acceptable at $>.95$), Tucker-Lewis index (TLI; acceptable at $>.95$) and the root mean square error of

approximation (RMSEA; acceptable at $<.05$). Statistical equivalent models were tested in order to make sure that the hypothesised relations between variables fitted the data best (Kline, 2005).

2.3 Results

Student perceptions of feedback

The scree plot of the exploratory factor analysis showed a hitch at two, four and seven factors. Based on the relation between the factor solutions and our theoretical framework we chose to interpret the six-factor solution following the hitch at seven factors. This solution explained 49.5% of the total variance, compared to 30.4% and 39.1% respectively for the one- and three-factor solution and 46.9% and 51.9% for the five- and seven-factor solution.

The descriptive statistics and the factor loadings for each of the feedback perception items are presented in Table 2.1. From this table it can be seen that focus, elaboration and goal-relatedness items each clustered into two factors. First, the two factors with the high-loading focus items were labelled Focus on task (factor 6) and Focus on self-regulation (factor 4). Second, the factors with the high-loading elaboration items were labelled Positive elaboration (factor 2) and Negative elaboration (factor 3). Lastly, the factors with the high-loading goal-relatedness items were labelled Feed up (goal-setting; factor 1) and Feed back-forward (factor 5). One factor loading larger than 1.000 was found; this does not have to be problematic as in factor analysis with oblique rotation factor loadings should be interpreted as a regression coefficient, not as a correlation coefficient (Kenny, 2004).

Looking at the descriptive statistics of the feedback perception items, the low means for the items loading high on Focus on self-regulation and Feed up stand out. Low means would indicate that students perceive that they almost never receive this type of feedback and high means indicate that students perceive they receive this type of feedback often. Also, the means for the items loading high on Positive elaboration and some Feed back-forward items are rather low. The highest means were found for the items loading high on Focus on task and Negative elaboration.

The eigenvalues (after rotation) are presented in Table 2.3, and show that the factors Feed up and Feed back-forward explain most variance in the data structure, and contribute most to the factor solution. Furthermore, Focus on self-regulation explains least variance in the variables, followed by Negative elaboration. The correlations between the factors ranged from .19 to .62 (see Table 2.3). As can be seen, the correlation between the two factors that contain the goal-relatedness items, i.e. Feed up and Feed back-forward, is high (.61). This suggests that when describing student perceptions of feedback, we could speak of high or low perceived goal-relatedness. However, the correlation between the factors with high-loading focus items (Focus on task and Focus on self-regulation) is only small to moderate (.19). This suggests that for describing perceived focus of feedback, two rather different aspects need to be described (i.e. Focus on task and Focus on self-regulation). In addition, a small to moderate correlation was also found between the factors with high-loading elaboration items, i.e. Positive elaboration and Negative elaboration (.19). Therefore, for describing student perceptions of feedback elaboration we also need to describe the extent of perceived positive and negative feedback separately. This suggests that perceptions of Positive and Negative elaboration are distinctive elements of feedback elaboration.

Table 2.1

Factor loadings of exploratory factor analysis with ML estimations and Oblimin rotation and descriptive statistics per item

Focus	Factor						M	SD
	1	2	3	4	5	6		
<i>The feedback of my supervisor concerns...</i>								
1. the methods of my study	.373	.019	.101	.062	-.022	.097	3.39	1.08
2. the use of theory in my study	.120	.057	.106	-.055	.016	.440	3.75	1.00
3. the content of my written work	.045	.073	.036	-.157	.218	.438	3.97	0.95
4. the structure of my written work	.054	.023	-.032	.028	-.017	.660	3.65	1.06
5. the style of my written work	-.038	-.021	.015	.104	-.007	.489	3.04	1.22
6. my motivation	-.008	.108	.010	.605	.073	-.031	2.06	1.13
7. my planning	.132	-.007	.089	.347	.161	-.020	2.50	1.19
8. my work ethos	.029	-.020	.003	.776	-.078	.150	1.85	1.03
Elaboration								
<i>The feedback of my supervisor concerns...</i>								
9. what I do well	.000	.816	-.058	.017	.052	.062	3.19	1.16
10. what I do not do well yet	-.041	-.078	.820	.070	-.043	-.021	3.41	1.11
11. why something is good enough	.050	.831	.063	.039	-.021	-.044	2.81	1.26
12. why something is not yet good enough	.031	.182	.701	-.050	.044	.050	3.31	1.12
13. hints for how I could have done it better	.034	.135	.229	.106	.156	.186	3.07	1.15
14. hints for how I could best handle something	.198	.189	.094	.019	.368	-.022	3.27	1.18
Goal-relatedness								
<i>The feedback of my supervisor indicates...</i>								
15. what a good thesis looks like	.585	.013	-.060	.024	.087	.095	2.66	1.20
16. how a good study is executed	1.058	.038	-.031	-.063	-.090	-.050	2.90	1.17
17. how a good researcher operates	.569	.020	-.005	.114	.154	-.036	2.57	1.13
18. to what extent my work meets the expectations	.074	.043	.018	.097	.448	.036	2.81	1.14
19. to what extent I am on the right track	-.031	.184	-.095	-.018	.647	.100	3.41	1.10
20. to what extent I progressed in light of previous time	-.029	.143	.035	.107	.489	.037	2.61	1.25
21. what I have to do to reach my goals	.085	-.047	.033	.041	.780	-.063	3.12	1.15
22. the next steps to take	.086	.012	.120	-.084	.489	.139	3.54	1.07
23. on what aspects I need to improve my study	.118	-.049	.290	-.153	.311	.175	3.66	1.01

Note. **Bold** indicates factor loadings >.40; Grey indicates factor loadings <.30.

Table 2.2

Items for measuring Student Satisfaction with Supervision (SSS) and Perceived Supervisor Contribution to Learning (PSCL)

Item	M	SD
SSS		
I am satisfied with the feedback that I receive	5.18	1.55
I am satisfied with my supervisor	5.28	1.62
PSCL		
After a meeting with my supervisor...		
...I understand what is expected from me	3.77	0.97
...I understand what I have to do in order to progress	3.89	0.92
...I understand how I can best handle things best	3.50	1.04
...I understand how I can deal with difficult situations	3.21	1.04
Because of the feedback of my supervisor, so far I have learned a lot	4.84	1.61

Table 2.3

Correlation matrix for feedback perception factors

	Eigenvalue	High-loading goal-relatedness items		High-loading elaboration items		High-loading focus items	
		a	b	c	d	e	f
a. Feed up (goal-setting)	4.88	---	---	---	---	---	---
b. Feed back-forward	5.66	.605	---	---	---	---	---
c. Positive elaboration	4.17	.438	.616	---	---	---	---
d. Negative elaboration	3.20	.372	.427	.194	---	---	---
e. Focus on task	3.66	.433	.462	.354	.454	---	---
f. Focus on self-regulation	1.95	.244	.199	.265	.181	.191	---

Note. **Bold** indicates correlations $>.40$; Grey indicates correlations $<.30$.

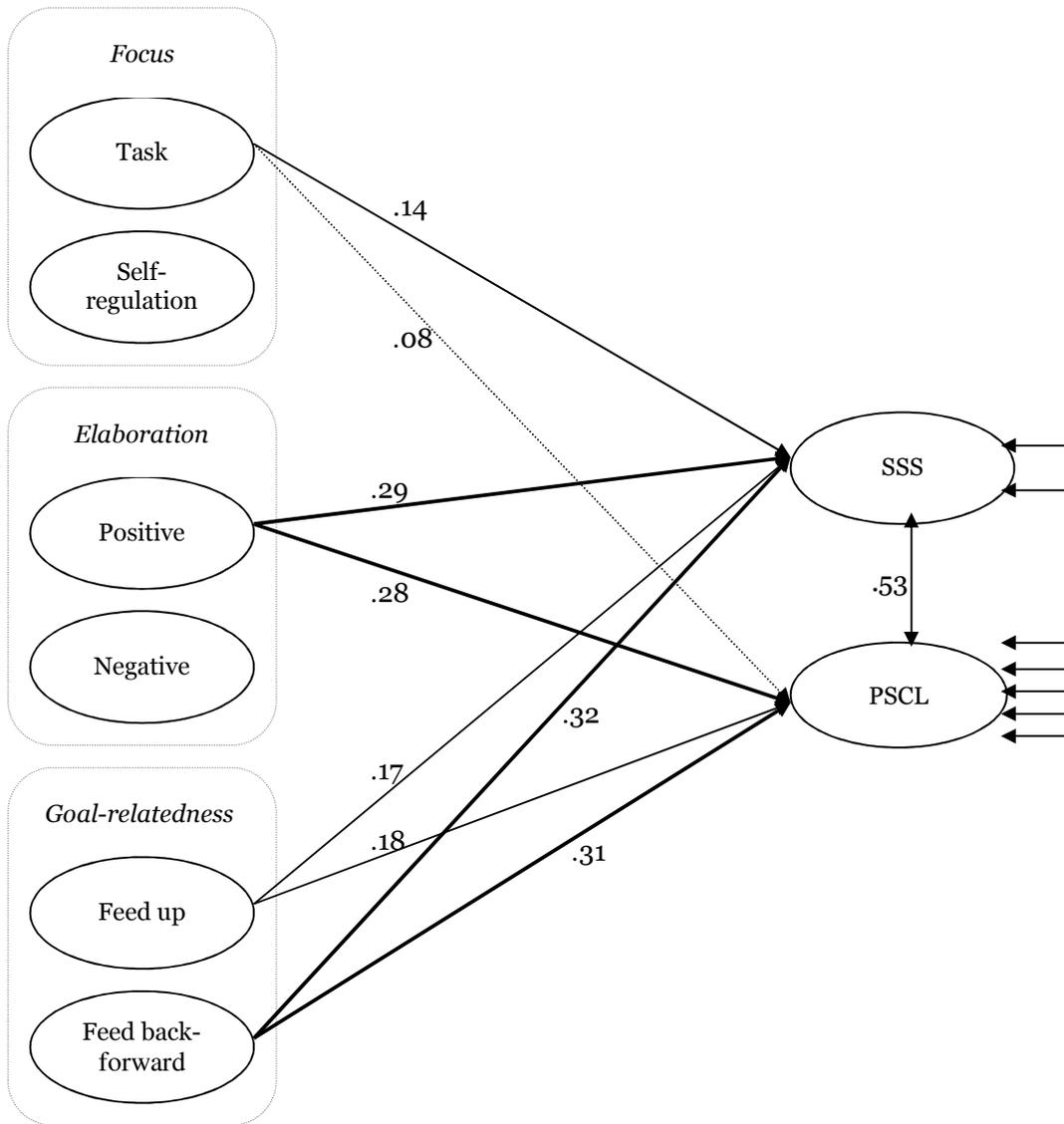


Figure 2.1 Final structural equation model, with feedback perceptions predicting Student Satisfaction with Supervision (SSS) and Perceived Supervisor Contribution to Learning (PSCL), with standardised coefficients. Presented relations are significant at $p < .05$. $R^2_{SSS} = .58$, $R^2_{PSCL} = .52$.

Model with feedback perceptions predicting process quality measures

The structural equation model predicting Student Satisfaction with Supervision (SSS) and Perceived Supervisor Contribution to Learning (PSCL) is presented in Figure 2.1. For both SSS and PSCL the measurement model was included and for the feedback perceptions the factor scores were included as if they were observed variables. As earlier models showed the non-significance of the relations between Negative elaboration and Self-regulation on the one hand and SSS and PSCL on the other, in the final model these relations were constrained to be zero. Furthermore, for two pairs of items of PSCL, cross loadings between the error terms had to be included in order for the model to properly fit the data. This could be explained as the first pair of items both concerned the *what* of the task ('after a meeting with my supervisor I understand what is expected from me'; 'after a meeting with my supervisor I understand what I have to do in order to progress') and the second pair of items both concerned the *how* of the task ('after a meeting with my supervisor I understand how I can handle things best'; 'after a meeting with my supervisor I understand how I can deal with difficult situations'). A significant chi square term was found for the final model ($X^2(34, N=996)=105.37, p<.01$), which might be interpreted as a bad fit. However, given the large sample, chi square was very likely to be significant in the first place (Kline, 2005). Therefore, based on the other fit indices (TLI=.98; CFI=.99; RMSEA=.05), we conclude that the final model fitted the data well.

In general, the model indicates that four of the six feedback perception factors are significant predictors for SSS and PSCL. From strong to weak these are: Feed back-forward, Positive elaboration, Feed up and Focus on task. Most factors comparably predicted SSS and PSCL, with the exception of Focus on task which is a stronger predictor for SSS than for PSCL. Surprisingly, it was found that neither Negative elaboration nor Focus on self-regulation could predict SSS or PSCL. In total, the model explained a proportion of .58 of the variance in SSS, and a proportion of .52 of the variance in PSCL. These proportions are considered to be large (Cohen, 1988).

2.4 Discussion

Next, conclusions are discussed in the light of research findings of other studies and in relation to the specific context of the master's thesis project. First, with respect to feedback *focus*, in contrast to Feedback on task, Feedback on self-regulation was minimally perceived and was not found to predict Student Satisfaction with Supervision and Perceived Supervisor Contribution to Learning. This is surprising as Hattie and Timperley (2007) concluded that in classroom settings, feedback on self-regulation is powerful in terms of enhancing deep processing and task mastery. Also, Heikkilä and Lonka (2006) found deep learning approaches to be related to self-regulation. As a master's thesis project can be considered a complex task in which deep learning is required, it would be expected that feedback on self-regulation would be appreciated maybe even more than feedback on task.

Interestingly, this was not found. A possible explanation is that students do not recognise the possible value of feedback on self-regulation (Price et al., 2010). This might be due to the fact that students do not receive it that much in the first place. It might also be the case that students working on a master's thesis project are in the final stage of their educational programme and have already developed their self-regulation strategies and do not need Feed back on it anymore. A third explanation might be that students are more concerned with short-term goals, i.e. completing the task, than long-term goals, i.e.

becoming self-regulated learners, which would be in line with the findings of Orsmond and Merry (2011). Fourthly, it might be possible that the items in the questionnaire themselves suggested short-term goals. Future research might investigate the issue of feedback on self-regulation in higher education more deeply to better understand the findings of this study, by, for instance, exploring both linear and non-linear relations.

Second, concerning *goal-relatedness*, our factor analysis distinguished the factors Feed up and Feed back-forward, which indicates that students do not seem to see feed back and feed forward as different elements of their feedback. This might be explained by the context of the master's thesis in that the supervision is often cyclical and thus attention can be paid concurrently to how students are doing as well as what the next steps to take are. This explanation is strengthened by the fact that Orsmond and Merry (2011), in the context of one-instance coursework feedback, found that tutors gave only minimal feed forward. Furthermore, we found that Feed back-forward was a stronger predictor for the outcome measures than Feed up. This is interesting as one might expect that when the feedback does not address the goals (Feed up), then Feed back-forward is also less clear (see also Bloxham & Campbell, 2010). Indeed, Weaver (2006) found that students find feedback that is not related to the assessment criteria less effective. A possible explanation for this finding might again be that students are more concerned with the short-term process (what is the next step to take?) instead of the long-term process (what is the final goal?), which again relates to the findings of Orsmond and Merry (2011). Another possible explanation would be that feed back-forward messages from a supervisor are in fact related to the goals, but that this is not recognised by students as such. The fact remains that students did perceive the feedback to only minimally concern feed up, while it does contribute to students' satisfaction and perceived supervisor contribution to learning.

Third, concerning feedback *elaboration*, other than how Shute (2008) conceptualised it in terms of what, how and why, students in the context of master's thesis supervision seem to perceive feedback as being positively elaborated or negatively elaborated. It is important to note the difference between our findings and the way, for instance, Young (2000) describes positive and negative feedback. He found in his qualitative study that students, depending on their self-esteem, tend to view feedback as being more positive or negative. With positive he refers to the student *response to* the feedback, rather than the *perception of* the feedback. So students in this study seem to differentiate between whether feedback is about something they did well or about something that was not yet good enough and needs improvement. Furthermore, it was found that Positive elaboration was a strong predictor for the outcome measures whereas Negative elaboration was not. This is rather surprising as most authors recommend a balance between positive and negative feedback as being the most effective (Lizzio & Wilson, 2008). Maybe a balance is mainly determined by positive feedback, as negative feedback is more often provided. Ferguson (2011), investigating student perceptions of feedback in the context of teacher education, also found that students really appreciate and need positive feedback. Again this might be explained by taking a student perspective and considering student goals. If most students mainly have a performance goal orientation (i.e. achieving a standard and getting things done) instead of a learning orientation, it is likely that they are more satisfied with positive feedback (indicating that they are approaching the standard) than with negative feedback (indicating that there is more to learn and improve; VandeWalle, 2003). Future research should address student goals in master's thesis

projects in order to find out whether student goals can indeed explain the relation between students' perceptions of feedback and their satisfaction and perceived supervisor contribution to learning.

With regard to the complete set of factors that we found in this study, they show a remarkable resemblance to the findings of Lizzio and Wilson (2008), who asked students what kind of feedback they found the most effective, useful or helpful. After a study in which qualitative data were gathered and used for designing a questionnaire, they found three factors: *developmental*, *encouraging* and *fair feedback*. Developmental feedback provided information about the gap between the current performance and the standard in order to reach this standard, which shows a resemblance to our Feed back-forward and Feed up factors. Encouraging feedback provided information about what a student did well in terms of both task and process, which we think shows a clear resemblance to our Positive elaboration factor. Fair feedback concerns the clarity and consistency of feedback and is therefore more form related than content related. Interestingly, Lizzio and Wilson (2008) also found developmental feedback and encouraging feedback to explain most variance in their data and to be strongly related to a perceived effectiveness of feedback measure. In our view, our findings build on the findings of Lizzio and Wilson by partly confirming their findings in a different context and by adding the aspect of Feed up and of Focus on task, as we found that both were also related to the outcome measures. Furthermore, as Lizzio and Wilson asked students about a range of assessment tasks, the resemblances indicate that the factors we found might not be so specific for one-on-one and face-to-face feedback situations after all. Lastly, we deem the finding that perceptions of Focus on self-regulation were not related to the outcome measures to be an important contribution that requires further study.

However, it is important to note that only overall feedback perceptions were investigated and not perceptions related to specific feedback instances. We thus treated perceptions of feedback as a concept that can be measured in general, whereas in fact it may differ considerably at each supervision meeting and thus results might have been different if feedback perceptions had been investigated on the level of specific feedback instances. In terms of addressing the generalizability of these findings, it should be noted that caution is needed. The questionnaire was administered at one university in one country. These findings thus cannot be generalised to situations in which master's thesis projects are arranged differently (i.e. with group supervision).

Conclusion and implications

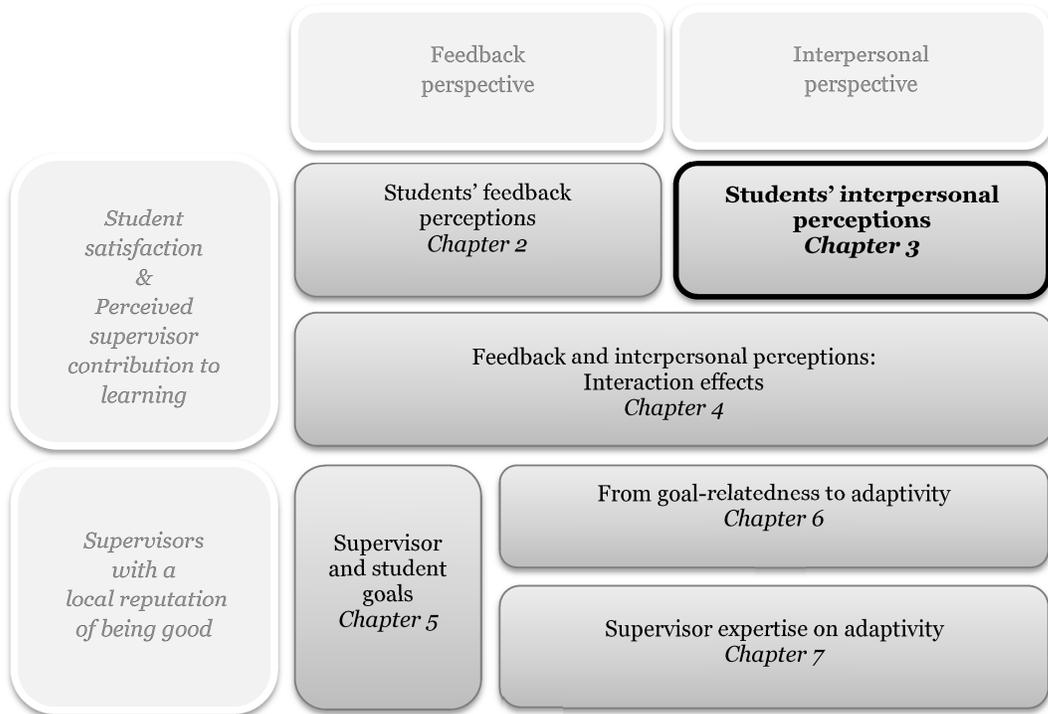
The present study investigated student perceptions of feedback in the context of master's thesis supervision. We addressed the following research questions: How do students perceive their feedback in terms of focus, goal-relatedness and elaboration items? What factors underlie these student perceptions and how are these factors related to student satisfaction and perceived supervisor contribution to learning? It is concluded that students perceive supervisor feedback largely in accordance with the theoretical concepts that are used in feedback literature, namely in terms of: Feed up, Feed back-forward, Focus on task, Focus on self-regulation, Positive elaboration, and Negative elaboration. Furthermore, most importantly we conclude that with respect to supervisor feedback, most students perceive only a minimal Focus on self-regulation and little Feed up whereas they perceive more Focus on task and more Negative feedback. Lastly, it is concluded that perceptions of

Negative elaboration and Focus on self-regulation do not contribute to Student Satisfaction with Supervision and Perceived Supervisor Contribution to Learning, whereas Positive elaboration and Feed back-forward contribute most to these outcome measures.

The practical implications of this study can be found in combining the extent to which students perceive getting a certain type of feedback with the strongest predictors for the outcome measures. Feed back-forward and Positive elaboration were found to be the strongest predictors, while low means were found for most of their high-scoring items. Therefore, we would suggest that master's thesis supervisors should invest in providing more feed back-forward and positive elaborated feedback in addition to the feedback that is already provided. The same holds for Feed up, as this was found to contribute to Student Satisfaction with Supervision and Perceived Supervisor Contribution to Learning, but in the view of students is only minimally provided. We do acknowledge that measuring the effectiveness of feedback is difficult to establish and that Student Satisfaction with Supervision and Perceived Supervisor Contribution to Learning may not be optimal outcome measures. However, we agree with Price et al. (2010) that even though the learner may not always recognise the benefits that feedback can provide, the learner is in the best position to judge the effectiveness of feedback as they are the ones who actually work with the feedback. This study has shown that for students it is important that they receive positive and goal-related feedback from their supervisor during their master's thesis project.

Quality of supervision

Perspectives on master's thesis supervision



Chapter 3

Students' interpersonal perceptions ²

Master's thesis supervision is a complex task given the two-fold goal of the thesis (learning and assessment). An important aspect of supervision is the supervisor-student relationship. This quantitative study (N=401) investigates how perceptions of the supervisor-student relationship are related to three dependent variables: final grade, perceived supervisor contribution to learning, and student satisfaction. The supervisor-student relationship was conceptualised by means of two interpersonal dimensions; control and affiliation. The results indicated that a greater degree of affiliation was related to higher outcome measures. Control was positively related to perceived supervisor contribution to learning and satisfaction, but for satisfaction, a ceiling effect occurred. The relation between control and the final grade was U-shaped, indicating that the average level of perceived control is related to the lowest grades. The results imply that it is important for supervisors to be perceived as highly affiliated and that control should be carefully balanced.

² This chapter is based on Kleijn, R.A.M., Mainhard, M.T., Meijer, P.C., Meijer, Pilot, A., & Brekelmans, M. (2012). Master's thesis supervision: relations between perceptions of the supervisor-student relationship, final grade, perceived supervisor contribution to learning, and student satisfaction. *Studies in Higher Education*, 37(8), 925-939.

3.1 Introduction

Several studies have indicated that the supervisor-student relationship is an important aspect in master's thesis supervision (e.g., Seagram, Gould, & Pyke, 1998). Most studies concerning the supervisor-student relationship are small-scale interview studies and descriptive in nature (e.g., Anderson, Day, & McLaughlin, 2006). Insight into how the supervisor-student relationship in the context of master's thesis supervision is related to other variables, such as student and supervisor satisfaction, time to complete, quality of the thesis, and the quality of the learning process of the student, would provide relevant starting points for understanding and improving supervision processes. In this study we aim to investigate how the supervisor-student relationship is related to student satisfaction, final grade, and perceived supervisor contribution to learning.

In most European countries the final assessment in a master's degree programme is the master's thesis (Meeus, van Looy, & Libotton, 2004) in which students individually perform a piece of research. This master's thesis is a complicated task for students, since the goal of doing the thesis is twofold; the thesis has both a learning goal and an assessment goal (Todd, Smith, & Bannister, 2006); on the one hand, students, mostly for the first time in their education, perform a piece of research independently and therefore have to *learn* how to actually do research, and on the other hand students have to show that they are *capable* of doing research independently and are worthy of the master's degree.

Students can be supported in this complex task in several ways. Dysthe, Samara and Westrheim (2006) described three forms of support: supervision groups, student colloquia and individual supervision. Based on a cohort case study, they concluded that the three forms of support supplement each other, and that individual supervision is crucial to students for getting specific advice. Furthermore, there is variation in supervision between different research fields (Egan, Stockley, Brouwer, Tripp, & Stechyson, 2009; Smeby, 2000). In some fields researchers work together in small groups in labs, and master's students doing their thesis are enrolled in such a research group. This is in line with Hasrati (2005), who argued that research supervision is a form of legitimate peripheral participation. Another scenario is that researchers tend to work more independently and consequently the supervision of students is more a one-on-one relationship and thus is more intimate in nature. Several studies have indicated the importance of individual research supervision for time to complete the thesis, and for the learning outcomes of the students (e.g., Drennan & Clarke, 2009; Ives & Rowly, 2005; Seagram, Gould, & Pyke, 1998).

In the Netherlands, traditionally master's students have one supervisor who guides them through the process of their research in a more or less one-on-one relationship. When the student has completed their thesis, their supervisor, together with a second and independent assessor, determines the final grade for the thesis. Consequently, the supervisor has two important roles, as a supervisor and as an assessor. Thus, the goal for supervisors is obviously two-fold: the supervisor on the one hand has to guide the student in his or her research, and on the other hand has to assess the quality of the research of the student. This can lead to conflicting interests for supervisors. For instance, when the supervisor guides the students a lot in their learning process it becomes more difficult to appropriately judge the quality of their thesis, since the supervisor has also influenced that quality.

This may result in the supervisor grading his or her own work, instead of the thesis of a student. Therefore, it is important to understand the relationship between supervision and student outcomes.

One potentially influential aspect of research supervision is the interpersonal relationship between supervisor and student (Halse & Malfroy, 2010; Peterson, 2007). Most studies that investigate the supervisor-student relationship are small-scale interview studies, resulting in a framework for describing different forms of the supervisor-student relationship (e.g., Acker, Hill, & Black, 1994; Anderson, Day, & McLaughlin, 2006; Dysthe, 2002; Grant, 2003; Ylijoki, 2001). A recurrent finding is that the relationship can be described by means of two dimensions, which are given various names: intimacy and direction (Acker, Hill, & Black, 1994), supporting and structuring (Anderson, Day, & McLaughlin, 2006), cold-warm and structure-free (Brown & Atkins, 1988), professional role-personal self and dependence-independence (Lee, 2008), affiliation and power (Nelson, 1997), and proximity and influence (Mainhard, van der Rijst, van Tartwijk, & Wubbels, 2009). In all these studies one dimension describes the extent to which the supervisor is emotionally involved in the project and/or with the student, and the other dimension describes the extent to which the supervisor gives direction to the student activities. Therefore, in the present study these two dimensions form the basis for investigating the supervisor-student relationship. Next, in the theoretical framework, the conceptualisation of the supervisor-student relationship is described.

Theoretical framework

Supervisor-student relationship

In the current study students' interpersonal perceptions of their supervisor are employed as an indicator of the supervisor-student relationship. Student perceptions are considered an appropriate indication because a supervision relation is intimate in nature and thus can be best judged by the participants themselves (Kam, 1997). Interpersonal perceptions are described in terms of two dimensions that describe the amount of control and affiliation a supervisor conveys according to the student (e.g., Kiesler & Auerbach, 2003; Tiedens & Fragale, 2003). Interpersonal theory claims that these two dimensions underlie all social behaviour (e.g., Fiske, Cuddy, & Glick, 2006; Judd, et al., 2005). Interpersonal circumplex models combine these two dimensions in one framework (e.g., Kiesler & Auerbach, 2003; Leary, 1957).

Wubbels, Créton and Hooymayers (1985) adapted the Leary interpersonal circumplex to the educational context. The control dimension describes the extent to which a particular teacher or supervisor influences the student activities; the affiliation dimension describes the emotional distance or interpersonal proximity between a supervisor and a student. According to the circumplex structure, all possible behaviours are associated with both dimensions. For example, supporting behaviour can be characterised as being very positively associated with affiliation and moderately positively with control. Accordingly, uncertain behaviour can be characterised as moderately low on affiliation and low on control. Note that the control dimension does not equal teacher regulation (e.g., Vermunt & Verloop, 1999). For instance, a supervisor saying: 'I want you to find your own literature, and only consult me in case you really get stuck' is high on interpersonal control, but this supervisor is low on teacher regulation and does not take over the student's activities.

Final grade, perceived supervisor contribution to learning, and satisfaction

In this study we aim to investigate the relation between the supervisor-student relationship and outcomes. However, it is difficult to define an appropriate outcome measure. As described above, the master's thesis often has two main goals: the students should show that they are able to carry out and report research (assessment goal) and the students should learn about doing research (learning goal). Both goals are broad and it is unclear how it can be decided to what extent a student is indeed able to do research, and to what extent the student has learned from doing the master's thesis, and more importantly *what* the student has learned. Pearson and Brew (2002) describe the difficulty of describing the goals of research training in a list of generic skills that should be mastered after finishing the master's thesis. Furthermore, they argue that such lists would underestimate the complex interactions between the skills that are necessary to be a successful researcher.

The definition of the goals of the master's thesis becomes even more complicated when this question is raised: who determines what the goals are? Is it the departments, the supervisors, or maybe the students themselves? Irrespective of this, several studies have indicated the importance of goal alignment between supervisor and student (e.g., Anderson, Day, & McLaughlin, 2006; Denicolo, 2004; Grant & Graham, 1999; Halse & Malfroy, 2010; Philips & Pugh, 2005), which indicates that it is not just a matter of who determines what the goals are. It is important that the different stakeholders agree on the most important goals.

However, despite the difficulty of defining the goals of the master's thesis and the supervision, three generic outcomes can be described, and they will be used in this study. First, given the assessment goal of the master's thesis, the quality of the thesis is an important student outcome of the master's thesis project. An indicator for this quality is the final grade for the thesis. In the Netherlands, theses are usually awarded a grade on a scale of 1.0 to 10.0, with 5.5 being satisfactory. The final grade is awarded by the student's supervisor after a consultation with an independent assessor. The assessment procedures are evaluated internally each year by an exam committee, and externally every six years. This is to ensure that each grade is assigned in a relatively independent manner. However, in our view, the final grade is never entirely independent of the supervisor. This is important to bear in mind when investigating the link between the supervisor-student relationship and the student's final grade.

Secondly, even though it is not quite clear what *exactly* students should learn and maybe want to learn, the master's thesis project does serve a learning goal. Therefore, it is important that supervision contributes to the learning process of the student. Students can be asked to report the perceived contribution of the supervision meetings and supervisor feedback to their learning. However, Bowman (2010) found that in higher education, student self-reported learning did not seem to be an appropriate measure of longitudinal growth, and the extent to which students can correctly estimate their supervisor's contribution to their learning is disputable. On the other hand, we argue that the perceived contribution is at least as important the actual contribution made by the supervisor, as the students' perceptions are one of the most important mediators in the relation between teacher behaviour and student outcomes (Shuell, 1988). In other words, the greater the perceived supervisor contribution to learning, the more the students will actively use their supervisor's comments and

input. Therefore, we consider perceived supervisor contribution not as an indication of the supervisor's actual contribution but as an important variable in itself.

Thirdly, student satisfaction will be taken into account. Kam (1997) argues that given the highly personalised nature of the supervision process, it is important to use satisfaction as an indicator for the quality of the supervision. Furthermore, Ives and Rowley (2005) found in their study with PhD students that dissatisfied students are less likely to finish their thesis. This stresses the importance of including satisfaction in studies concerning thesis supervision. Student satisfaction can include satisfaction with the student's own role, satisfaction with their own rate of progress, satisfaction with their supervisor, etc. For the purpose of this study, we focussed specifically on students' satisfaction with their supervisors. Next, research findings in terms of the relation between the supervisor-student relationship and student outcomes and satisfaction are discussed, which will lead to the research question of this study.

Supervisor-student relationship, student outcomes and satisfaction

In this section the findings of two lines of research will be discussed: (1) findings from large-scale and quantitative studies in secondary education investigating the relation between the two interpersonal dimensions and student outcomes, and (2) findings from studies in the context of master's thesis supervision, which are often small-scale and qualitative in nature. First, findings with respect to the control dimension are discussed.

Research in secondary education has shown that the control dimension is positively related to both cognitive student outcomes and affective outcomes (mostly measured as subject specific motivation; Wubbels & Brekelmans, 2005). In the context of research supervision, several studies describe the difficult task for supervisors of creating a delicate balance between the need to guide and structure the student work on the one hand, and to preserve the student's autonomy on the other hand (Delamont, Parry, & Atkinson, 1998; Li & Seale, 2007). Also, Anderson and colleagues (2006) found that supervisors find it difficult to balance their shaping behaviour. This suggests that even though in secondary education more control is related to better student outcomes, in thesis supervision too much control might interfere with the student's learning outcomes. Surprisingly, however, even though this is widely accepted, this suggestion has not previously been empirically investigated.

Considering the affiliation dimension, research in secondary education has indicated a positive relationship with both cognitive and affective student outcomes (Wubbels & Brekelmans, 2005). However, some studies suggest that a ceiling effect occurs for the positive effect of affiliation (den Brok, 2001; den Brok, Brekelmans, & Wubbels, 2004), indicating that teachers can be too affiliated. In the context of master's thesis supervision, Anderson and colleagues (2006) found that students reported that emotional support from their supervisor was an important factor in their supervision, contributing to their effectiveness. The study of Lindèn (1999) with PhD students also indicated that when students were asked about problems within the supervision, they most frequently reported a lack of genuine interest and emotional support. On the other hand, too much affiliation in terms of the supervisors' interest in their students' personal lives might also be risky, given the fact that supervisors still need to be able to grade the final thesis as objectively as possible (Manathunga,

2007). Therefore, it is interesting to question whether or not a ceiling effect occurs for affiliation, as it seems to do in secondary education..

All of this leads to the following research question to be addressed in the present study: *how can the relation between the supervisor-student relationship in terms of perceived interpersonal control and affiliation on the one hand, and outcomes measures in terms of final grade, perceived supervisor contribution to learning, and satisfaction on the other hand, best be described?*

3.2 Methods

Participants

The target population included all students who were involved in writing their master's thesis on a one-year master's programme at the Faculties of Social and Behavioural Sciences, Geo Sciences, and Humanities at a large Dutch university. We collected 409 completed online questionnaires. Eight cases were excluded from the analysis (three students were from other departments, four had had no supervision meetings yet, and one student accidentally completed the questionnaire twice so the second set of data was excluded from analysis). Of the included participants, 77% were female students. The high percentage of women in the sample reflects the percentage of women in the master's programmes of the departments. Students were 21 to 65 years old ($M=24.76$, $SD=4.70$). At the time of completing the questionnaire, 75 students had recently finished their thesis and 326 students were still working on it. The students who respectively completed and were still working on their thesis had on average been working on it for 30 and 20 weeks ($SD=20.51$; 16.39), and had had on average eight and five supervision meetings ($SD=5.69$; 4.91).

Instrumentation

Supervisor-student relationship

Student perceptions of the supervisor-student relationship in terms of interpersonal control and affiliation were tapped with the Dutch version of the Questionnaire on Supervisor Doctoral Student Interaction (QSDI; Mainhard et al., 2009). Items of the QSDI are formulated as statements that have to be rated on a five-point Likert-type scale ranging from 1 = '(almost) never' to 5 = '(almost) always'. Example items are: 'My supervisor trusts me' and 'My supervisor wants me to do things his/her way'. Because the QSDI is based on a *circumplex structure*, each of the two example items refers to both interpersonal dimensions (the former is more strongly weighted for the affiliation, the latter for the control dimension). Some items were reworded to better fit the context of the master's thesis project.

To investigate the validity of the QSDI, a confirmatory factor analysis was conducted. Results of this analysis suggested that a model with two independent dimensions (i.e., control and affiliation) and circular ordering of the items fitted the data well ($\chi^2(15, N=401)=36.52$, $p=.002$; TLI=.96; CFI=.98; RMSEA=.09). The correlations between empirical factor scores (based on the confirmatory factor analyses) and theoretical factor scores (based on circumplex based loadings) for control and affiliation were respectively .93 and .99. This suggests that the deviations from the ideal model in this study only had a minimal effect on the reported theoretical dimension scores. The Cronbach's alpha for control was .78 and for affiliation .93, and scores could theoretically range from -2.60 to 2.60.

Outcome measures

Three dependent variables were included. First, the quality of the thesis was measured by using students' final grades. Because most students were still working on their thesis at the moment of completing the questionnaire, students could indicate whether they were willing to provide their final grades after finishing their thesis. In total, 223 students provided us with their final grades. In the Netherlands theses are graded on a scale from 1 to 10, with a 5.5 being satisfactory. Grades are awarded by the supervisor and an independent assessor.

Secondly, perceived supervisor contribution to learning was measured. Therefore, on a five-point scale, students indicated how much they had learned from the supervision, and on four items they indicated to what extent the supervision meetings contributed to their understanding of the task ($\alpha=.89$).

Thirdly, the supervision outcome student satisfaction was measured. Students were asked to indicate satisfaction with the supervision on a seven-point segmented graphic rating scale on two items ($r=.82, p<.001$).

Procedure

With the permission of the Deans of the Faculties, all potentially relevant students received an email in November 2008 or June 2009, with a link to the online Dutch version of the QSDI. In this email students were asked whether they had started their master's thesis project and, if so, they were invited to participate in the present study on a voluntary and anonymous basis. Due to the university's privacy regulations, no reminder could be sent to students who did not respond to the email. Also, due to these regulations we were not able to determine how many students received the email, and were consequently unable to determine the exact response rate. The estimated response rate, based on the number of students per Faculty, is 30%.

Analysis

To answer the research question, several structural equation models were fitted. In the models, control and affiliation predicted perceived supervisor contribution to learning, final grade, and satisfaction. In order to investigate how the relation between control, affiliation and the outcome measures could be best described, both linear and quadratic effects were explored. A quadratic effect between two variables is U-shaped and always has a quadratic term in the regression equation (i.e. X^2). Therefore, following the procedure set out by Kline (2005), a quadratic term was computed for both the control and affiliation scores.

First, a linear only model was fitted as a baseline model. In this model, all of the relations between the quadratic terms of control and affiliation on the one hand and perceived supervisor contribution to learning, the final grade and satisfaction on the other were constrained to equal zero. Second, a quadratic model was fitted in order to investigate whether or not quadratic effects would improve the model fit. In the quadratic model, all of the relations between the quadratic terms of control, affiliation, perceived supervisor contribution to learning, the final grade and satisfaction were freely estimated. Only the significant relations were retained in this model. Thirdly, a final model was fitted in order to ensure that only the relevant quadratic effects were retained in the model. The relevance of

adding the quadratic effects was investigated by inspecting the added explained variance in the dependent variables. The final model thus included only those quadratic effects that were considered to be relevant. The model fits were evaluated by inspecting the Tucker-Lewis index, comparative fit index (CFI), and root mean square error of approximation (RMSEA). Threshold levels were .90 for TLI and CFI and .10 for RMSEA (Kline, 2005).

3.3 Results

Descriptive statistics

For all variables included in the analyses, Table 3.1 presents the descriptive statistics. On average, students perceive their supervisors to be somewhat controlling and fairly affiliated. Furthermore, we found that students are satisfied, perceive that they learn considerably from undertaking a master's thesis, and on average their theses are awarded with a 7.50, ranging from 5.00 to 9.50.

Comparison of models

First, the linear only model is discussed in which all significant linear effects were modelled, and all quadratic effects were constrained to equal zero. Then, the quadratic model and the final model, in which the relevant quadratic effects were added, are presented. Fit indices for all three models are presented in Table 3.2.

The fit indices of the linear only model indicated a good fit. It was found that control was positively related to perceived supervisor contribution to learning and satisfaction, but not to the final grade. Affiliation was related to all three dependent variables; final grade, perceived supervisor contribution to learning and satisfaction.

In the quadratic model the significant relations between the quadratic terms and the dependent variables were freely estimated. It was found that the quadratic model fitted the data better than the linear only model, with a significant decrease in the chi-square value ($\Delta\chi^2(3, N=1)=37.57, p<.01$). This was supported by a small improvement in TLI, CFI, and RMSEA (see Table 3.2). With respect to affiliation no quadratic effects were found on any of the dependent variables. With respect to control quadratic effects were found on all three dependent variables: perceived supervisor contribution to learning, final grade, and satisfaction.

Table 3.1

Descriptives for control, affiliation, perceived supervisor contribution to learning (PSCL), final grade, and student satisfaction

	<i>N</i>	<i>M</i>	<i>SD</i>	Min.	Max.
Supervisor-student relationship					
Control	401	0.44	0.41	-1.27	1.49
Affiliation	401	1.17	0.68	-1.54	2.33
Dependent variables					
PSCL	401	3.90	0.92	1.00	5.00
Final grade	223	7.50	0.71	5.00	9.50
Student satisfaction	401	5.32	1.50	1.00	7.00

Table 3.2
Comparison of nested models

	<i>Df</i>	χ^2	TLI	CFI	RMSEA
Model 1: Linear only model	13	73.20*	.90	.96	.11
Model 2: Quadratic model	10	37.57*	.94	.98	.08
Model 3: Final model	11	41.48*	.94	.98	.08

* $p < .05$.

To investigate the relevance of adding the individual quadratic effects, the linear only model and the quadratic model were compared in terms of proportion of explained variance per dependent variable (see Table 3.3). It was found that the addition of the quadratic effect of control on satisfaction and final grade explained an additional 2% and 3% of variance in these variables. Therefore, these relations were considered to be relevant. For perceived supervisor contribution to learning only less than 1% was additionally explained by the quadratic effect of control, and was therefore not considered to be relevant. Therefore, in the third and final model the quadratic effect of control on perceived supervisor contribution to learning was removed. The final model is presented in Figure 3.1.

Parameter estimates of the final model

With respect to control both a linear and a quadratic effect were found on satisfaction. The relation between control and satisfaction is graphically represented in Figure 3.2 (line 3). As can be seen, the bended curve indicates that at the lower level of control a gain in control is associated with higher satisfaction. The higher the control, the smaller the gain in satisfaction becomes. With high levels of control, satisfaction tends to drop slightly. Furthermore, a small effect was found for control and perceived supervisor contribution to learning, indicating that students who perceived more supervisor control also believed they had learned (a little) more from their supervisors than other students (see Figure 3.2, line 2). Finally, for final grade, only a quadratic effect was found to be significant. However, in this case the quadratic effect is positive, as opposed to the negative relation to satisfaction. The relation between control and final grade is graphically represented in Figure 3.2 (line 1). From the figure it becomes clear that, from low levels of control to the average level, an increase in control is related to a decline in final grade. From an average level to high levels of control, an increase in control is related to an increase in final grade.

Table 3.3
Proportions of explained variance for perceived supervisor contribution to learning (PSCL), final grade, and satisfaction

	PSCL	Final grade	Satisfaction
Model 1: Linear only model	.63	.06	.75
Model 2: Quadratic model	.63	.09	.77
Model 3: Final model	.63	.09	.77

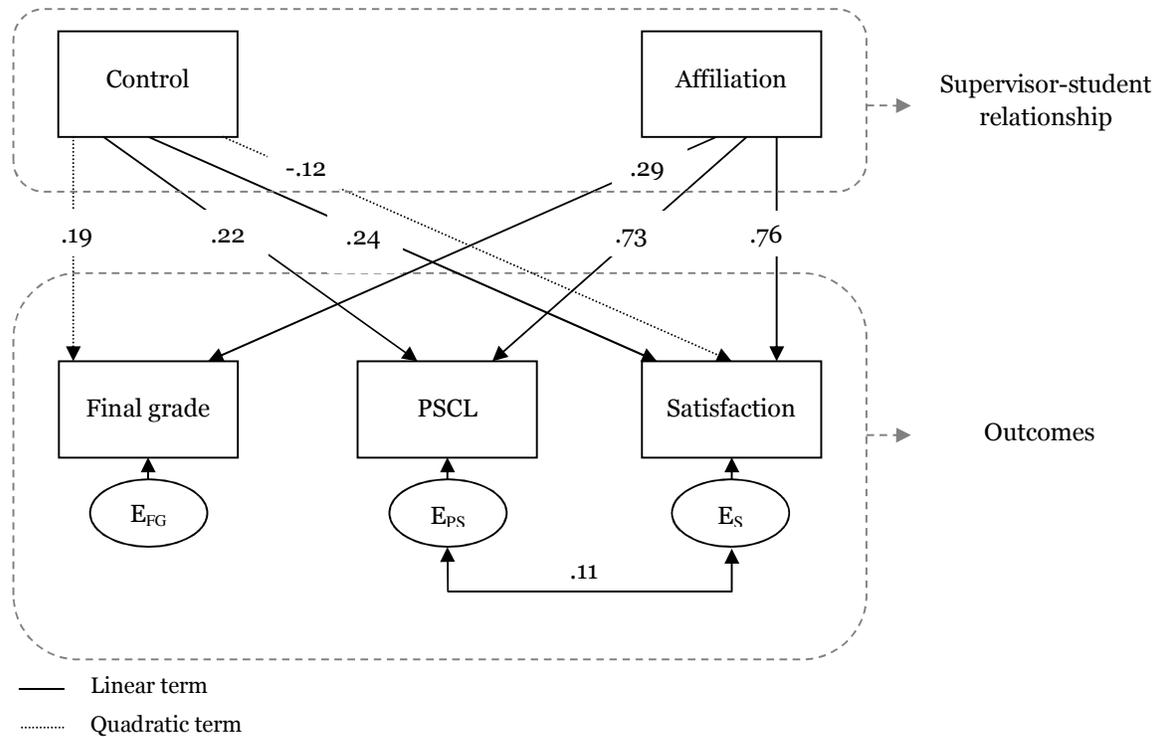


Figure 3.1 Structural model for the relation between perceptions of the supervisor-student relationship and the outcome measures; E_{FG} = error final grade, E_{PS} = error perceived supervisor contribution to learning, E_S = error satisfaction.

For affiliation only linear and no quadratic effects were found. Affiliation was strongly related to perceived supervisor contribution to learning and satisfaction and moderately to final grade (see Figure 3.3). Overall, it was found that in general both interpersonal dimensions are positively related to satisfaction and perceived supervisor contribution to learning, with affiliation being a stronger predictor than control. Lastly, it was found that the error terms of perceived supervisor contribution to learning and satisfaction were related. This indicates that these two variables have more overlap than is accounted for by the variables included in the model.

In summary, students perceived their supervisors to be somewhat controlling and fairly affiliated. They are quite satisfied, believe they have learned considerably from the supervision, and on average are awarded fairly high grades. Furthermore, at lower levels of control, students who perceived higher interpersonal control reported higher satisfaction. At higher levels of control, students who perceived higher control reported only little higher satisfaction, and at a certain point students with higher control even reported lower levels of satisfaction. Furthermore, higher perceived control resulted in higher perceived supervisor contribution to learning. Lastly, with respect to students' final grades, it was found that students who perceived average control received the lowest grades, students who perceived low control received higher grades, and students who perceived high control received the highest grades. With respect to affiliation, it was found that this dimension was positively related to both satisfaction and perceived supervisor contribution to learning.

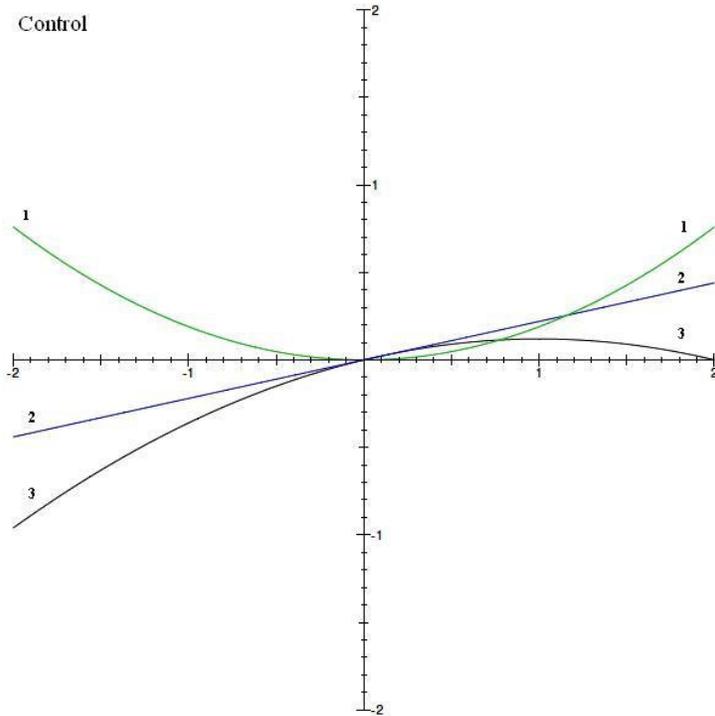


Figure 3.2 Relation between final grade ($y(x)=.19*x^2$) [line 1], perceived supervisor contribution to learning ($y(x)=.22*x$) [line 2], and satisfaction ($y(x)=.24*x-.12*x^2$) [line 3] on the y-axis and control on the x-axis for centred scores.

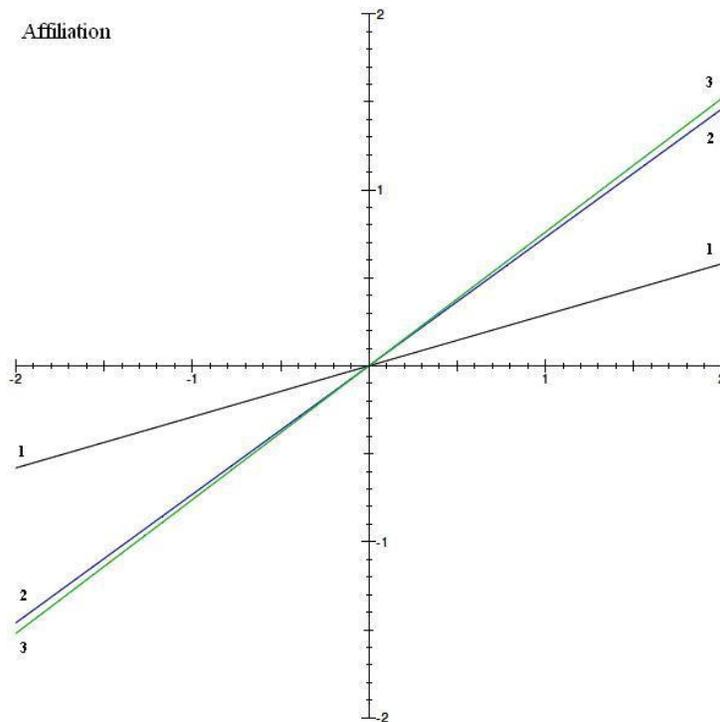


Figure 3.3 Relation between final grade ($y(x)=.29*x$) [line 1], perceived supervisor contribution to learning ($y(x)=.73*x$) [line 2], and satisfaction ($y(x)=.76*x$) [line 3] on the y-axis and affiliation on the x-axis for centred scores.

3.4 Discussion

The aim of the present study was to investigate how student perceptions of the supervisor-student relationship are related to final grade, perceived supervisor contribution to learning and student satisfaction. Perceptions of the supervisor-student relationship were measured by using a questionnaire measuring perceived interpersonal control and affiliation. Various authors suggested non-linear relations (e.g., Delamont, Parry, & Atkins, 1998), and therefore both linear and quadratic effects were explored. From the results of this study, it can be concluded that students that perceive more affiliation from their supervisor receive higher final grades, are more satisfied, and perceive their supervisor to have a larger contribution to their learning. So, no quadratic effects were found for affiliation. With respect to control we conclude that high levels of perceived supervisor control lead to a decrease in student satisfaction, as expected, and to a continuing increase in perceived supervisor contribution to learning, as was not expected. Also, the finding that students that perceive average control receive the lowest grades, was unexpected.

The quadratic effect of control on satisfaction is in line with the argument put forward by Delamont, Parry and Atkins (1998), that too much control on the part of the supervisor can lead to students feeling that they are not the owner of their work, and that therefore too much control might be related to a decline in satisfaction. In terms of perceived supervisor contribution to learning, however, no decrease was found for students who perceived higher levels of control. These findings indicate that students supervised by a highly controlling supervisor are less satisfied but perceive that their supervisor contributes more to their learning.

The positive quadratic effect of control on students' final grades, is not in line with research findings either from secondary education or from the context of master's thesis supervision. A possible explanation for the unexpected finding might be found in the grading practices. The supervisor and a second independent assessor determine the final grade for the thesis. They might focus on either the learning or the assessment goal in their grading practice. For the supervisors this focus might be reflected in their interpersonal relation with students. Supervisors focusing on the learning goal, might be perceived as having high interpersonal control because they provide students with a lot of guidance and structure in order for them to learn optimally from doing their thesis. Their students thus might be awarded with higher grades. On the other hand, supervisors focusing on the assessment goal, might be perceived as having low interpersonal control because they interfere minimally in the process because they want students to show what they are capable of. These supervisors might award their students with higher grades when they worked rather autonomously. This raises the question of what criteria are used for grading the theses, and how these criteria are weighed: what is *actually* graded? And more interestingly, how are supervisor goals of a thesis related to how they build interpersonal relationships with students. However, next to the judgment of the supervisor the final grade also reflects the judgment of the second and independent assessor.

For affiliation, it was found that more perceived interpersonal affiliation was related to higher levels of satisfaction and perceived supervisor contribution to learning. This is in line with the findings of Anderson, Day and McLoughlin (2006), Lindèn (1999), and Wubbels and Brekelmans (2005), who also found that a higher level of affiliation was related to higher student outcomes. However, no ceiling effect was found as was expected based on the work of Manathunga (2007). These findings

suggest that emotional involvement with the students is not a sign of softness or of non-professional behaviour, but is essential in order for students to be satisfied and to feel that they are learning from their thesis project.

Furthermore, a small relation was found with the final grade. This might be explained by the fact that students who have a more affiliated supervisor are more motivated, work harder on their thesis, and therefore hand in theses of higher quality. Indeed, research into secondary education has indicated that affiliation is strongly related to subject-specific motivation (Wubbels & Brekelmans, 2005).

Limitations

Even though the findings of this study provide relevant insights into the role of the supervisor-student relationship in master's thesis supervision, it is important in interpreting these findings to be aware of some of the limitations of the study. First, in the present study we investigated perceived supervisor contribution to learning. For this variable, it is possible that a halo effect has occurred (Pike, 1999), which is a faulty consistency in raters' scores. More specifically, it is possible that students who were satisfied with their supervisors automatically wrote that they perceived that they had learned a lot from their supervisor. This is supported by the correlation between the error terms of both variables. However, this correlation was only small, so it can be assumed that, to a certain extent, satisfaction and perceived supervisor contribution to learning do represent two distinct variables rather than one.

Secondly, as addressed above, the final grade of the students is supposed to represent the quality of the theses. However, these grades are decided upon by the students' supervisor and a second assessor who was not involved in the supervision. Naturally, all supervisors grade theses from their own frame of reference and find some aspects of student performance more important than others. The same may be true for the independent assessor, but he or she only has information about the content of the thesis, and not about the research process. Furthermore, as the goal of the master's thesis is twofold (learning and assessing), this grade often represents a combination of the quality of the learning and the quality of the thesis itself, and it is unclear how both aspects are weighted in the final grade. Therefore, it is unclear to what extent the final grade represents the quality of the thesis on the one hand and the quality of the learning process on the other. Our research findings raise the issue of the transparency of the grading procedure. In future research, therefore, three distinct measures should be used: the assessor's grade for the quality of the thesis, a supervisor's grade for the quality of the thesis, and a supervisor's grade for the research process and the quality of the writing.

Lastly, this study addressed general trends and relationships. This is not, however, to suggest that there is one superior type of supervisor-student relationship. There is a lot of variation between individual students, which leads to students having their own individual needs. Next to the general trends investigated in this study, it is of course important for supervisors to pay attention to these individual needs.

Practical implications

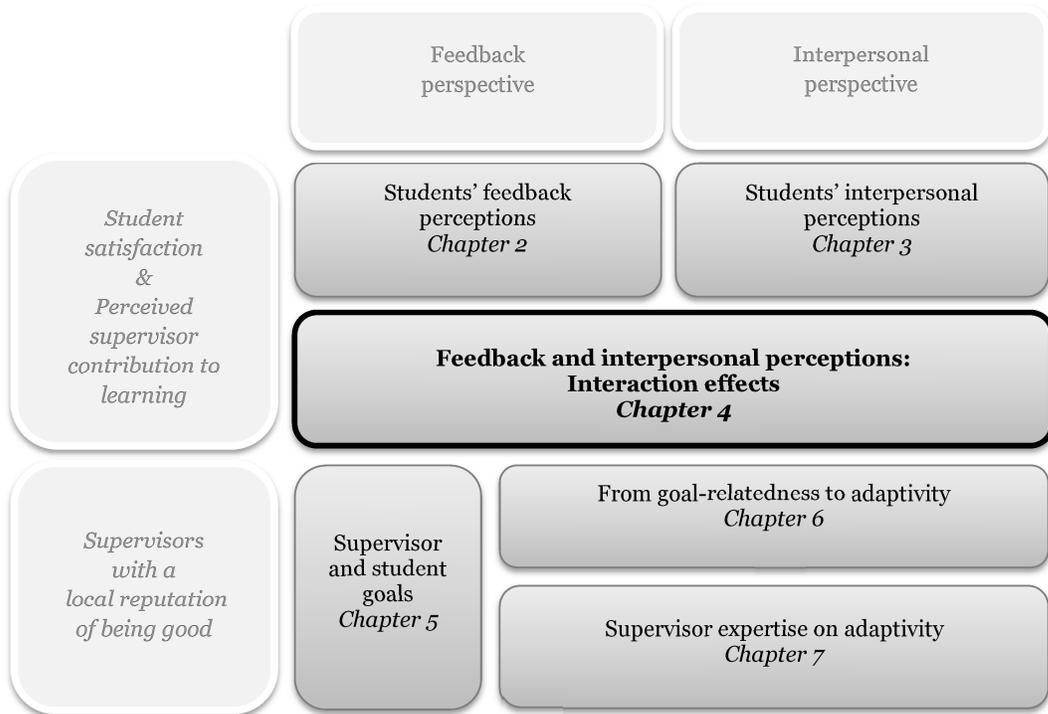
Despite the discussed limitations, practical implications can be drawn from the findings of this study. First, the importance of personal support was confirmed by this study, indicating that it is important for supervisors to be personally involved in the master's thesis projects of their students. This can be established by, for instance, asking students how they are doing in their research, responding to student emails quickly, and showing a personal interest in the topic and/or thesis. Even though some supervisors might view thesis supervision as a strictly professional relationship, it is still important for students to feel support from their supervisor.

Secondly, the difficulty of balancing interpersonal control by a supervisor has become clearer. For student satisfaction and perceived supervisor contribution to learning it is important for supervisors not to take a submissive role, but to provide some structuring and guidance to the students. However, it is still important to adapt the level of structuring to the specific student for students to feel ownership of their project. The key element is that students *perceive* structuring and guidance, and some students will need more explicit structuring than others. Therefore, it is advisable for supervisors to check this with the students themselves.

Thirdly, in the grading of the thesis, it is advisable that supervisors clarify what they have actually graded and how they weighed different aspects. A strategy for clarifying goals could be to provide a graded thesis by another student, so that students can actually see how a thesis is graded and when the goals are met. Another strategy is to implement peer feedback in the master's thesis project. By having students provide feedback to others by means of the criteria that will be used to grade their own thesis, the criteria and goals become clearer to students (van den Berg, Admiraal, & Pilot, 2006). When the thesis has both assessment and learning goals, it would be best to grade the quality of the thesis and the learning of the student independently of each other. Future research could investigate the extent to which supervisors (and students) pursue these goals and how these goals may influence the supervision process.

Quality of supervision

Perspectives on master's thesis supervision



Chapter 4

Feedback and Interpersonal Perceptions³

Research supervision can be investigated from social–emotional and cognitive perspectives, but most studies include only one perspective. This study aims to understand the interplay between a social–emotional (supervisor–student relationship) and cognitive (feedback) perspective on the outcomes of research supervision, by investigating student perceptions of both. Questionnaire data (N=1016) were collected and analysed using regression analyses. It was found that in relation to student satisfaction (SS) and students’ perceived supervisor contribution to learning (PSCL), affiliation by far is most important, followed by control for SS and feed back-forward for PSCL. Also, interaction effects between feedback and interpersonal perceptions were found, indicating that the role of feedback perceptions is most important in situations in which no optimal supervisor–student relationship could be established. Findings imply the importance for supervisors of creating warm relationships with students and that if this is problematic, extra care should be taken concerning how students perceive the feedback.

³ This chapter has been submitted for publication in adapted form as: Kleijn, R.A.M. de, Meijer, P.C., Meijer, Pilot, A., & Brekelmans, M. (*submitted*). The relation between feedback perceptions and the supervisor–student relationship in master’s thesis projects.

4.1 Introduction

In most academic higher education institutions in Europe, a master's thesis is the final element of a master's degree programme (Meeus, van Looy, & Libotton, 2004). A master's thesis can be characterised as a complex research task in which a good supervision process is indispensable (e.g., Heath, 2002; McCormack, 2005; Seagram, Gould, & Pike, 1998). Mostly, this supervision entails supervision meetings between supervisor and student and sometimes this is complemented with written feedback via email. In order to understand the effects of the supervision process, this can be investigated from several perspectives; for instance from social–emotional perspectives such as giving thanks (e.g., Unsworth, Turner, Williams, & Piccin-Houle, 2010), and the supervisor–student relationship (de Kleijn, Mainhard, Meijer, Pilot, & Brekelmans, 2012; Nelson & Friedlander, 2001); or from cognitive perspectives, such as the discourse between a supervisor and a student (Vehviläinen, 2009), and the feedback that is provided by a supervisor (de Kleijn, Mainhard, Meijer, Brekelmans, & Pilot, *in press*; Pyhältö, Stubb, & Lonka, 2009). Most studies aiming to understand the process of research supervision, view supervision from one of such perspectives. However, arguably, in order to gain a more comprehensive understanding of the supervision process, more than one perspective may need to be included. Therefore, in order to understand the outcomes of the supervision process, in the present study both a social–emotional perspective and a cognitive perspective are included: the supervisor–student relationship and student perceptions of feedback. More specifically, whether it is possible for the relation between feedback perceptions and the quality of the supervision process to vary depending on the supervisor–student relationship as perceived by the student is explored. For instance, consider the following feedback message: ‘You might need to rewrite your introduction section so that it better fits your research question.’ This feedback might be interpreted differently when it is said by a supervisor that is perceived as highly insecure compared to a supervisor that is perceived as demanding and steering. To the best of our knowledge, so far no studies have addressed this interplay between student perceptions of feedback and of the supervisor–student relationship. Therefore, this study aims to provide a more comprehensive understanding of the quality of the supervision process by both investigating feedback perceptions and perceptions of the supervisor–student relationship.

Theoretical framework

Outcomes of the supervision process

In previous studies concerning the outcomes of research projects and research supervision, a wide variety of outcome measures are used, including both objective measures, such as time to complete (Seagram, Gould, & Pyke, 1998), number of publications (Martinsuo & Turkulainen, 2011), and final grade (de Kleijn et al., 2012), but also more subjective measures, such as student satisfaction (SS) (Kam, 1997; de Kleijn et al., 2012; de Kleijn et al., *in press*; Armstrong, 2004), perceived research skill development (Drennan & Clarke, 2009), perceived supervisor contribution to learning (PSCL) (de Kleijn et al., 2012; de Kleijn et al., *in press*), and student well-being (Nelson & Friedlander, 2001; Pyhältö, Stubb, & Lonka, 2009). But, if we want to measure the outcome of research supervision which measure would be most suitable?

De Kleijn et al. (2012) argued that the use of final grades might be problematic as the goals of thesis projects are often twofold, namely learning and assessing. They argue that it remains implicit whether a grade represents growth (learning) or the objective quality of a thesis (assessing). In this regard, Hamilton, Johnson and Poudrier (2010) also argue that appraising theses and dissertations in order to establish educational quality would be problematic for two reasons: students' pre-existing attributes, such as verbal ability, can be mistaken for educational effectiveness and there is no accounting for the effect of the richness and dynamism of the faculty–student interaction during research projects. In other words, they argue that the quality of a thesis does not only represent educational quality, but also students' pre-existing attributes and the quality of the faculty–student interaction. Therefore, such quasi objective measures might be invalid in measuring the outcomes of students' research projects.

In line with that, Kam (1997) argued that the effectiveness of research supervision could be best judged by those involved, namely the students, as they are in the best position to judge the supervision project. Also, Price et al. (2010), in discussing the effectiveness of feedback, argued that students are most capable of determining the effectiveness of feedback. Still, they do acknowledge that students might not always recognise the benefits of feedback. Based on these considerations, in the present study we decided to include two outcome measures from a student perspective that describe the quality of the supervision process: students' general satisfaction with the supervision and student perceptions of the extent to which the supervision has contributed to their learning to approximate the actual contribution of a supervisor in spite of the pre-existing attributes of students.

Cognitive perspective: feedback perceptions

According to students, one of the most important tasks of a research supervisor is to provide constructive feedback (Todd, Bannister, & Clegg, 2004). Also, Pyhältö, Stubb and Lonka (2009) found that students, who reported less stress, exhaustion and anxiety as a result of their thesis projects, were more satisfied with the supervisor feedback.

The concept of feedback can be viewed from the viewpoint of the sender, the receiver (or seeker), and/or an observer. We took the seeker/receiver's viewpoint, leading to the following conceptualization of feedback: information from a supervisor to a student that the student perceives to be about his/her performance and/or understanding. This study thus concerns student perceptions of feedback.

Building on the review findings of Hattie and Timperley (2007) and Shute (2008), a previous study showed that student perceptions of feedback in terms of feedback focus, elaboration, and goal-relatedness can be described in terms of six aspects. First, feedback focus could be described as perceived *focus on the task*, that is, the writing of a thesis, and perceived *focus on the student's self-regulation*, that is, the motivation, planning, and attitude of a student. Second, feedback elaboration could be described in terms of perceived *positive elaboration*, indicating the extent to which the feedback addresses and explains those aspects in which a student has already done well and perceived *negative elaboration*, indicating the extent to which the feedback addresses and specifies elements of the student's performance that are not yet good enough. Third, feedback goal-relatedness could be described as *feed up*, that is, for instance, the extent to which the feedback provides information about

what a good thesis looks like, and *feed back-forward* which provides information about where the student stands and which next steps a student should or can take (de Kleijn et al., *in press*). In the present study, these six aspects are used to describe student perceptions of feedback.

Social–emotional perspective: supervisor–student relationship

Given the highly personalised nature of the one-on-one interaction and long duration of a master's thesis project, the supervisor–student relationship is an inevitable part of research supervision. Nelson and Friedlander (2001) investigated student problems in conflictual supervisory relationships. These students reported, among other things, being overworked, experiencing extreme stress and self-doubt as well as developing health problems. Also, Halse and Malfroy (2010) found that supervisors consider a personable relationship with their students important, indicating that supervisors themselves highly value the supervisor–student relationship.

Often, interpersonal relationships are investigated, employing perceptions of those being part of the relationship (e.g., Wubbels & Brekelmans, 2005). In the present study, based on the model for interpersonal teacher behaviour (Wubbels, Créton, & Hooymayers, 1985), interpersonal perceptions are conceptualised in terms of two dimensions that describe the amount of *control* and *affiliation* a supervisor conveys, according to the student (e.g., Kiesler & Auerbach, 2003; Tiedens & Fragale, 2003). Interpersonal theory claims that these two dimensions underlie all social behaviour (e.g., Fiske, Cuddy, & Glick, 2006; Judd, James-Hawkins, Yzerbyt, & Kashima, 2005). The control dimension describes the extent to which a particular supervisor influences student activities; the affiliation dimension describes the emotional distance or interpersonal proximity between a supervisor and a student. Interpersonal circumplex models combine these two dimensions in one framework (e.g., Kiesler & Auerbach, 2003; Leary, 1957), indicating that all possible behaviours are a combination of both dimensions. For example, uncertain behaviour can be characterised as moderately low on affiliation and low on control. In the present study, student perceptions of interpersonal control and affiliation are used to describe the supervisor–student relationship.

Feedback perceptions and the supervisor–student relationship

Even though studies concerning both feedback and the provider–receiver relationship are scarce, we did find studies providing some suggestions for the relation between both. Back in 1979, the review findings of Ilgen, Fisher and Taylor suggested that feedback perceptions are influenced by three characteristics of the feedback provider as perceived by the receiver: psychological closeness, credibility, and possibly power. Ilgen, Fisher and Taylor suggested that the accuracy with which a receiver interprets feedback would be higher when the receiver perceives the feedback provider as psychologically close, credible, and standing higher in hierarchy. In this regard, Lee and Schallert (2008), based on two case studies concerning written feedback in learning English as a foreign language, found that establishing a trusting relationship between teacher and student may be fundamental to the effective use of feedback in revision. They favour a reform of the cognitive process models of revision by including the role of the relationship between teacher and student.

Research question

Based on the presented problem definition and theoretical framework, this study addresses the following research question: *how are student perceptions of feedback and of the supervisor–student relationship related to student satisfaction and perceived supervisor contribution to learning, in the context of master’s thesis supervision?*

Based on the findings of Ilgen, Fisher and Taylor (1979) and Lee and Schallert (2008) this study explores whether perceptions of the supervisor–student relationship might affect the relationship between feedback perceptions and student satisfaction and perceived supervisor contribution to learning.

4.2 Methods

Participants

Between November 2009 and June 2011 all master’s students from three departments of a large Dutch university were invited to complete our online questionnaires. In total, 1016 students completed the questionnaires, an estimated response rate of 30%. Students were between 20 and 65 years old ($M=24.89$, $SD=5.03$). At the time of completing the questionnaire, 158 students had recently finished their theses and 857 students were still working on them. On average, they had been working on their theses for 29 and 21 weeks respectively, and had had, on average, 8 and 5 supervision meetings.

Instrumentation

Feedback perceptions

In order to measure students’ feedback perceptions, the questionnaire on student feedback perceptions (QSFP; de Kleijn et al., *in press*) was used and comprised items that were based on the theoretical framework concerning feedback focus, elaboration and goal-relatedness. Items of the QSFP are formulated as statements that have to be rated on a five-point Likert-type scale ranging from 1 = ‘(almost) never’ to 5 = ‘(almost) always’. Example items are: ‘the feedback of my supervisor concerns what next steps to take’ and ‘the feedback of my supervisor concerns why something was good’. Based on earlier findings of exploratory factor analysis of this sample, six factors were defined (de Kleijn et al., *in press*). Scores for these six factors were computed by using all items and their concurrent factor loadings on a specific factor using the Bartlett method (de Kleijn et al., *in press*; DiStefano, Zhu, & Mîndrilă, 2009). The scales were labelled feed up, positive elaboration, negative elaboration, feedback on self-regulation, feed back-forward, and feedback on task. Correlations between the six factors ranged from .19 to .62.

Perceptions of the supervisor–student relationship

Student perceptions of the supervisor–student relationship, in terms of interpersonal control and affiliation, were tapped using the shortened Dutch version ($N=32$) of the Questionnaire on Supervisor Interaction (QSI), based on the Questionnaire on Supervisor Doctoral Student Interaction (Mainhard et al., 2009; de Kleijn et al., 2012). Items of the QSI are formulated as statements that have to be rated on a five-point Likert-type scale ranging from 1 = ‘(almost) never’ to 5 = ‘(almost) always’. Example

items are: 'my supervisor trusts me' and 'my supervisor wants me to do things his/her way'. Because the QSI is based on a circumplex structure, each of the two example items refers to both interpersonal dimensions (the former is more strongly weighted for the affiliation, the latter for the control dimension).

To investigate the validity of the QSI, a confirmatory factor analysis was conducted. The results of this analysis confirmed that a model, with two independent dimensions (i.e. control and affiliation) and circular ordering of the items within eight subscales, fitted the data reasonably well ($\chi^2(28, N=1016)=4003.214, p<001$; TLI=.95; CFI=.98; RMSEA=.08). The Cronbach's alpha for control was .80 and for affiliation .90, and dimension scores could range from -2.60 to 2.60.

Quality of the supervision process

To measure Student Satisfaction (SS) the students were asked to indicate their level of satisfaction on two items on a seven-point scale; satisfaction with their supervisor and satisfaction with the supervisor's feedback ($r=.81$). With respect to perceived supervisor contribution to learning (PSCL) five items were used; students indicated on a five-point scale how much they had learned from the supervisor's feedback, and, using four items, indicated the extent to which the supervision meetings had contributed to their understanding of the task ($\alpha=.89$).

Procedure

With the permission of the Deans of the Social and Behavioural Sciences, Geosciences, and Humanities departments, all of the students enrolled in a one-year master's programme in one of these departments received an email in November 2008, June 2009, June 2010 or June 2011 with a link to the online questionnaires. The students who had started or recently finished their master's thesis projects were invited to participate in this study on a voluntary and anonymous basis.

Analysis

In order to answer the research question, several types of analyses were conducted. In order to explore the relation between feedback and interpersonal perceptions on the one hand and SS and PSCL on the other, both direct and interaction effects were tested for significance in several regression models. First, using centred variables we computed all possible interaction terms between the feedback and interpersonal perceptions ($N=12$). Second, all direct effects were regressed on SS and PSCL. Third, in separate models, the interaction effects with Control and Affiliation were added to the significant direct effects. Fourth, in a final model all significant direct and interaction effects were included. Fifth, as interaction effects generally are not significant for the total range of the moderator, using the Johnson-Neyman technique, as described by Hayes and Matthes (2009), the regions of significance of the interaction effects were established. Last, in order to interpret significant interaction effects, these were graphically interpreted with interpersonal Affiliation and Control being the moderators for the relation between feedback perceptions and SS and PSCL: the scores on Affiliation and Control were divided in two or three groups representing the regions of significance and non-significance. For each of these groups, the regression line for the relation between the feedback perception scale and SS or PSCL was plotted and interpreted.

4.3 Results

The final models of the regression analyses are presented in Table 4.1. For both SS and PSCL the direct effects of Negative elaboration and Focus on self-regulation were not significant, whereas all other direct effects were. Also, in both models, the strongest predictor by far was Affiliation, with Control being the second best predictor for SS, and feed back-forward being the second best predictor for PSCL.

In addition, for SS four significant interaction terms were found. For the interaction effect between Feed up and Affiliation the Johnson-Neyman significance region was $-.15$ and below. It was thus found that, in combination with Affiliation scores smaller than $-.15$, the effect of Feed up on SS was stronger than the main effect of Feed up. In other words, for students who perceive low supervisor Affiliation, Feed up leads to a higher increase in SS than for students who perceive high supervisor Affiliation (see Figure 4.1d). For the interaction between Affiliation and Feed back-forward it was found that the positive relation between Feed back-forward and SS was stronger for students who perceive low supervisor Affiliation ($<.48$) than the main effect of Feed back-forward (see Figure 4.1c). For the interaction between Control and Feed up it was found that the relation between Feed up and SS was stronger when students perceived low levels of Control ($<.12$; see Figure 1b). And lastly, for the

Table 4.1

Standardised regression coefficient for direct and interaction effects of feedback and interpersonal perceptions on Student Satisfaction

Variable	M1: Final model for SS	M2: Final model for PSCL
Supervisor–student relationship		
Affiliation	.604**	.489**
Control	.206**	.154**
Feedback		
Feed up	.065**	.132**
Feedback–forward	.127**	.173**
Positive elaboration	.065**	.118**
Negative elaboration	---	---
Focus on task	.070**	.091**
Focus on self-regulation	---	---
Interaction effects		
Affiliation * Feed up	-.052*	---
Affiliation * Feedback–forward	-.047*	---
Affiliation * Negative elaboration	---	-.037*
Control * Feed up	.038*	---
Control * Negative elaboration	-.044*	---
<i>R</i> ²	.778	.690
<i>F</i>	336.755	305.362

Note. $N=1016$

* $p < .05$. ** $p < .01$.

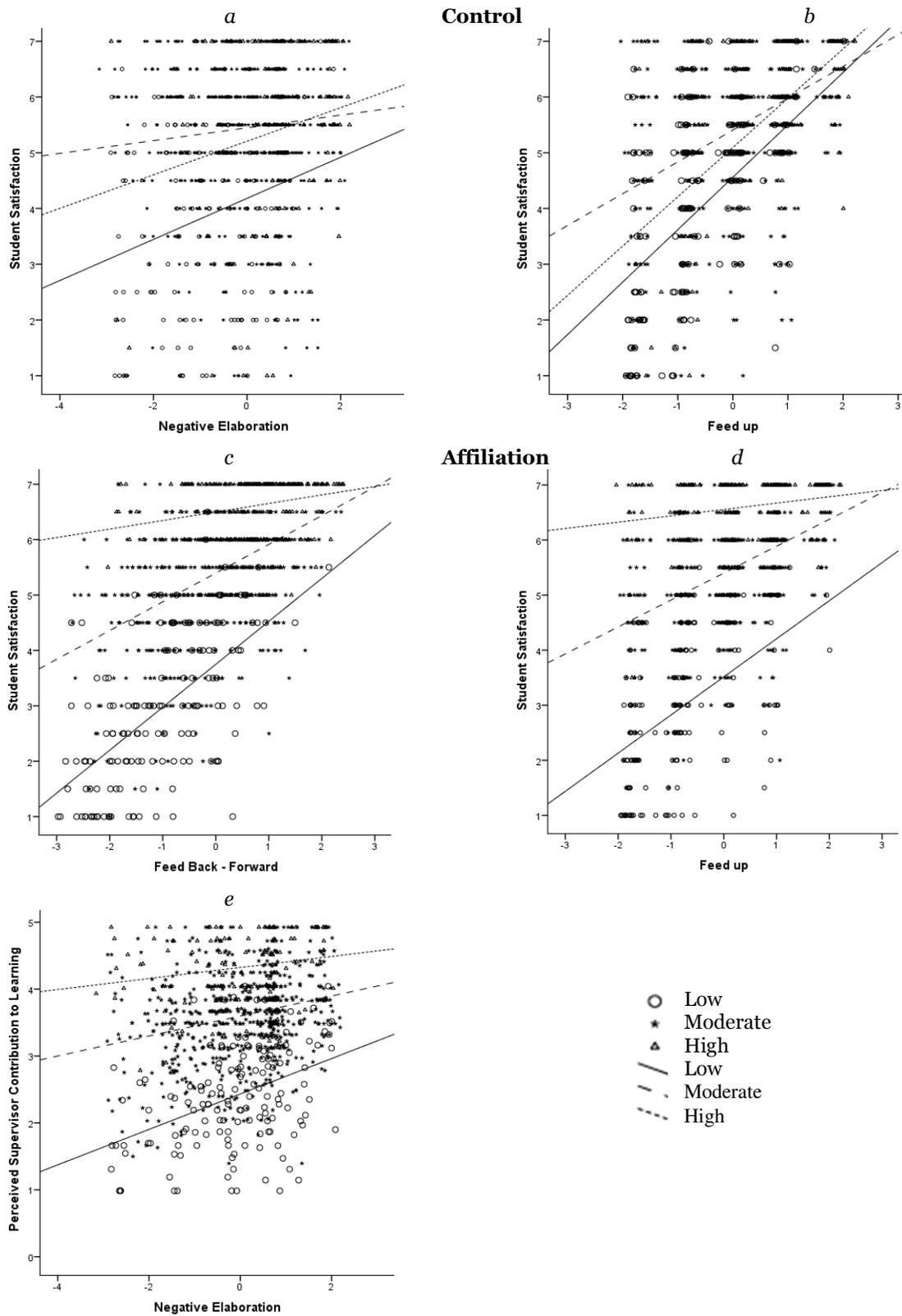


Figure 4.1 Graphical representation of interaction effects between feedback perception and perceptions of the supervisor–student relationship in relation to Student Satisfaction (a–d) and Perceived Supervisor Contribution to Learning (e).

interaction between Control and Negative elaboration, it was found that the relation between Negative elaboration and SS was significant for students who perceived low interpersonal Control ($<-.05$) and also significant but less strong for students who perceived high interpersonal Control ($>.40$; see Figure 4.1a). For PSCL only the interaction between Affiliation and Negative elaboration was found to be significant. It was found that for students with low perceived Affiliation ($<-.21$) the relation between Negative elaboration and PSCL was significantly positive (see Figure 4.1e).

4.4 Discussion

Previous research mainly investigated research supervision from either a social–emotional or a cognitive perspective. The present study aimed to combine both by including a feedback and a supervisor–student relationship perspective in order to assess the two process quality measures student satisfaction and perceived supervisor contribution to learning. Our research question therefore was: *how are student perceptions of feedback and of the supervisor–student relationship related to student satisfaction and perceived supervisor contribution to learning, in the context of master’s thesis supervision?* Based on the findings of Ilgen, Fisher and Taylor (1979) and Lee and Schallert (2008) it was expected that perceptions of the supervisor–student relationship might affect the relationship between feedback perceptions and student satisfaction and perceived supervisor contribution to learning.

First, concerning the relative importance of feedback and interpersonal perceptions with respect to student satisfaction and perceived supervisor contribution to learning, we found that affiliation by far is the most important aspect for students. We interpreted this as students attaching great value to feeling supported by their supervisors. In this regard, Martinsuo and Turkulainen (2011) found that, with respect to progress in research (measured by the number of publications), supervisor support interacted with personal time commitment; indicating that a student would need personal time commitment *and* supervisor support to advance in research, confirming the importance of supervisor support. We thus see that supervisor support or affiliation is important for both the objective and subjective outcome measures of research projects. Relating our findings to results in secondary education, it is interesting that in secondary education it was found that interpersonal control was more important for cognitive outcomes (e.g., achievement), and affiliation was more important for affective outcomes (e.g., subject-specific motivation; Wubbels & Brekelmans, 2005). Student satisfaction might be considered an affective outcome, but supervisor contribution to learning might be considered as a self-reported cognitive outcome. Therefore, it might appear to be surprising that, in this study, affiliation is so much more important than control. A possible explanation would be that a classroom situation would ask for more interpersonal control than a dyadic situation, as, in a classroom situation, possibly more than twenty learning processes need to be fostered compared to only one learning process in a dyadic situation. Another explanation could be that students in secondary education need more interpersonal control from their teachers than do higher education students, as the latter have developed into more self-regulated learners. However, this hypothesis should be tested in future research by, for instance, asking students about their ideal relationship with a teacher/supervisor.

Second, we found several interaction effects between feedback and interpersonal perceptions for student satisfaction and one for perceived supervisor contribution to learning. Interestingly, all of them indicated that, for students who perceive a less optimal supervisor–student relationship (i.e. low affiliation and/or low control), the effect of feed up, back, and forward and negatively elaborated feedback is stronger than for students who perceive a more optimal supervisor–student relationship. In other words, in less optimal supervisor–student relationships it matters even more how students perceive the feedback in order to establish student satisfaction and students feeling that their supervisor contributes to their learning process. Ilgen, Fisher and Taylor (1979) argued that feedback from a source that feels more psychologically close, is credible and has more power, is perceived more accurately. And even though our findings cannot be related to the credibility and power of the feedback provider, assuming that feedback that is perceived as intended leads to more satisfaction and learning, our findings do not confirm their hypothesis for closeness. After all, we found that students with low affiliated supervisors (i.e. emotionally distant) benefit even more from feed up, back, forward and negative elaboration than students with supervisors that are emotionally more close. However, we did not take into account the extent to which students perceive the feedback as was intended, so future research is needed to understand the interplay between accuracy of feedback perceptions, the student–teacher relationship and the effect of feedback. Lee and Schallert (2008) found that written feedback was more effective in a more trusting student–teacher relationship. Taking perceived supervisor contribution as a measure of the effectiveness of feedback, again our findings could not confirm that feedback perceptions in a more affiliated or warm relationship are more powerful. So, contrary to expectations, we found that in less optimal supervisor–student relationships the effect of feedback perception is stronger rather than weaker. A possible explanation for this could be that the expected role of the supervisor–student relationship takes place in the process of students perceiving the actual feedback message rather than in the process of feedback perceptions leading to satisfaction and/or perceived learning. This might be studied in a quasi-experimental design, by investigating whether students that perceive different levels of control and affiliation would perceive exactly the same feedback message differently in terms of feed up, back, forward and negative elaboration. Still, in the studies of Ilgen, Fisher and Taylor (1979) and Lee and Schallert (2008) the emphasis is on the emotional or affiliation dimension, but our results suggested that also interpersonal control interacts with feedback perceptions. This indicates that the effect of feedback perceptions does not only depend on the closeness of a supervisor but also on the supervisor’s steering.

Limitations, future research, and implications

A first limitation is that we measured student perceptions at only one time point during their master’s thesis projects, implicitly assuming that these are stable. However, it is unlikely that these perceptions are indeed stable taking into account the fact that for instance Anderson, Day and McLaughlin (2006) found that supervisors indicate constantly balancing their supporting and shaping commitments and actions. And even though our sample included students in different phases of their master’s thesis projects, future research might address perceptions of supporting and shaping using a longitudinal design in which how student perceptions change during the course of a master’s thesis project can be investigated. Also, in this study we approached the supervisor–student relationship as possibly being

conditional for the effectiveness of feedback perceptions. However, this might be a too simplistic way to conceptualise this relation as it is reasonable to think that also the feedback process might affect the supervisor–student relationship in the long run. Therefore, future research with a longitudinal design could address both these issues, for instance using cross-lagged panel regression models (e.g., Woldman, Vermunt, Bronkhorst, & Brekelmans, *submitted*).

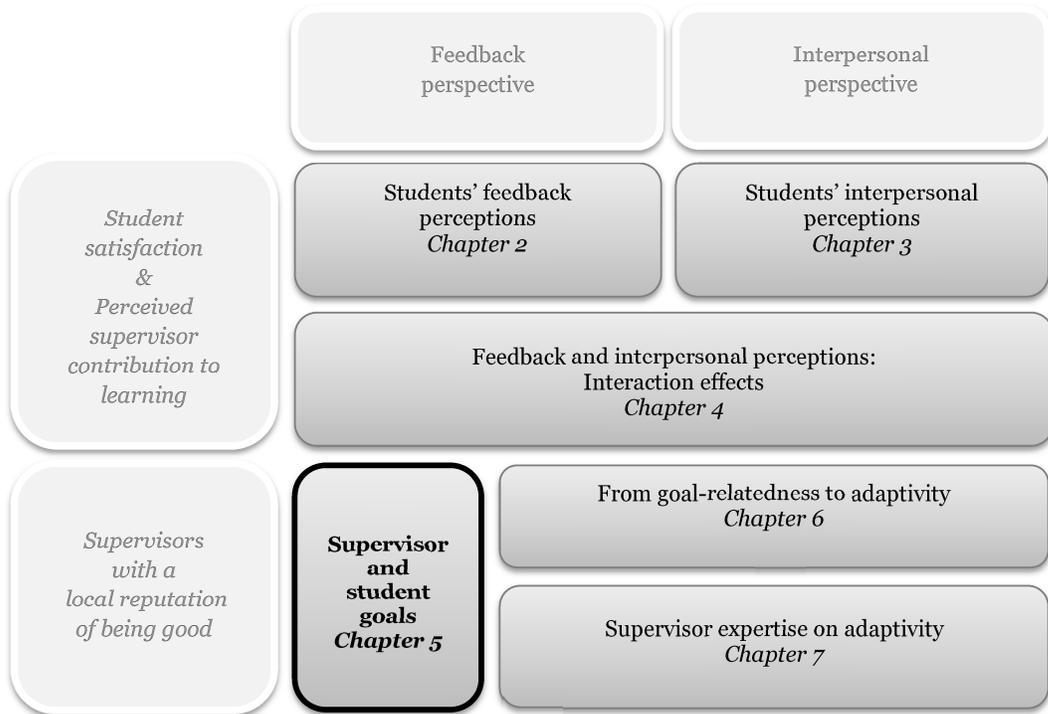
Second, we used the outcome measures student satisfaction and perceived supervisor contribution to learning. Price et al. (2010) argued that students are well able to recognise the role of feedback in improving performance but might not be equipped with some understanding of pedagogic concepts and processes in order to appreciate its contribution to the long-term development of learning and understanding, confirming the importance of distinguishing student satisfaction from perceived supervisor contribution to learning. But, even though self-reported outcome measures can provide interesting and important information, this does not automatically mean that students have actually learned from their thesis projects and the feedback. Therefore, only using self-reported outcome measures is not optimal in that it does not paint a complete picture. Therefore, we would suggest that future research also uses measures to map learning outcomes. However, this is not as easy as it seems, students (can) learn a wide variety of skills in general related to research but also related to their specific topic of study, which makes it difficult to measure learning outcomes in master's thesis projects. Furthermore, it immediately raises the issue of who will determine the learning outcomes: the student, the supervisor, an external observer (Price et al., 2010)? Still, we think this field of study is in need of more learning focused measures for measuring the effects of research projects. A first start for such an exploration could be interviewing graduate students about what they have learned from their theses in hindsight and interviewing experienced supervisors about what they think students in general learn from master's thesis projects, in order to develop instruments to measure such learning outcomes.

Lastly, we draw two practical implications from these findings. First, it was clear that for students to be satisfied and to perceive learning from the supervision process, interpersonal affiliation is most important. For supervisors this indicates the importance of creating warm relationships with students in which students feel seen, supported, and motivated by their supervisors. However, we do realise that this might be easier said than done. Second, the interaction effects between feedback perceptions and the supervisor–student relationship would suggest that, especially for supervisors that experience difficulty in creating relationships with students who can be characterised as steering and helpful (i.e., high control and affiliation), it is beneficial for their students to explain more explicitly their feed up, back, forward and negatively elaborated feedback. Related to this it is important to note that negative elaboration is not just indicating that which is not good enough in students' work but also explaining why it is not yet good enough.

In general, it is concluded that, from a student perspective, a warm supervisor–student relationship seems most important, and that the role of feedback perception is most important in situations in which such a relationship could not be established.

Quality of supervision

Perspectives on master's thesis supervision



Chapter 5

Supervisor and Student Goals⁴

To be effective, feedback should be goal-related. In order to better understand goal-related feedback in master's thesis projects, the present study explores the goals of supervisors and students in supervision dyads and similarities and differences within and between these dyads. Twelve supervisors and students were interviewed, and their goals were categorised using a curricular perspective and personal goals perspective. Results indicated that most students and supervisors pursue both curricular and personal goals, which is explained with the transitional phase from being a student to becoming a professional. Within dyads goals of supervisors and students vary greatly and supervisors recognise students' curricular goals better than students' personal goals. The findings suggest that goal-related feedback in master's thesis supervision can be complex, as students and supervisors (1) can pursue different goals and (2) do not always correctly perceive each other's goals.

⁴ This chapter is based on Kleijn, R.A.M., Meijer, P.C., Meijer, Brekelmans, M., & Pilot, A. (2013). Curricular goals and personal goals in master's thesis projects: Dutch student-supervisor dyads. *International Journal of Higher Education*, 2(1), 1-11.

5.1 Introduction

In most higher education institutions in Europe a master's thesis is the final element of a master's degree (Meeus, van Looy, & Libotton, 2004). In most cases a master's thesis project is characterised by a substantial research component, of which the learner determines the direction through prolonged engagement and with the support of a supervisor (Todd, Bannister, & Clegg, 2004). The quality of the supervision process is deemed one of the most important factors contributing to a successful project (e.g., Seagram, Gould, & Pyke, 1998), and providing effective feedback is an important task for the supervisor (e.g., Dysthe, Samara, & Westrheim, 2006). Research has indicated that effective feedback is, among other things, goal-related (e.g., Hattie & Timperley, 2007); which means that feedback should provide information to the learner about what the goals are, how a student's performance or understanding relates to the goals, and what a student can do to better reach those goals (e.g., Sadler, 1998). In a previous study in which 1028 master's students' perceptions of their master's thesis supervisors were surveyed, we found that in terms of goal-relatedness they perceived their feedback to provide only limited feed up, i.e., clarification of the goals (de Kleijn, Mainhard, Meijer, Brekelmans, & Pilot, 2012). In order to understand what goal-related feedback with feed up means in the context of master's thesis projects and how goal-relatedness might be improved, as a first step it is important to gain insight in what the goals of a master's thesis project are for those involved.

In literature the main goal of higher education in general is often described as preparing students for a successful career in working life and thus a good position on the labour market (Livanos, 2010; Jacob & Weiss, 2010). In the specific context of master's thesis projects, goals described in the literature include learning, assessing, and self-regulation (de Kleijn et al., 2012); students are supposed to learn to conduct and report a piece of research, students are supposed to learn to work rather independently, and students are assessed in terms of whether they meet the standards and are worthy of a master's degree. However, as feedback is usually provided during face-to-face meetings between a supervisor and a student, not only such curricular goals are important for understanding and improving goal-related feedback, but also the goals that are pursued by the specific supervisor and student who are the active agents in the supervision process and thus in the feedback dialogue.

Furthermore, we assume that in order for feedback to be provided and perceived as goal-related it is important for supervisor and student to know each other's goals. If students and supervisors work towards different goals, there could be misunderstandings or miscommunications during the supervision process. Indeed, Collier and Morgan (2008) and Lovvitts (2007) emphasised the importance of students correctly understanding what professors or supervisors expect of them, in order to achieve a good performance. One can imagine that when a supervisor and student have different goals without being aware of it, feedback might be provided and perceived from different perspectives, leading to the feedback process being perceived as not goal-related. The present study therefore aims to provide insight into the specific goals pursued by both supervisors and students in supervision dyads and into the extent to which they know each other's goals, addressing the following three research questions:

- 1) What goals do students and supervisors in a supervision dyad have for a master's thesis project?
- 2) What are similarities and differences between supervisor and student goals within and between dyads?
- 3) How do supervisor's goals relate to the student's perceptions of supervisor goals and how do student's goals relate to the supervisor's perceptions of student goals?

Theoretical framework

Conceptualising goals in higher education

Following the motivational systems theory (Ford, 1992), we understand goals to 'represent the consequences to be achieved (or avoided), and they direct the other components of the person to try to produce those consequences (or prevent them from occurring)' (p.83). In other words, goals are consequences to be achieved and are expected to steer behaviour so that these are indeed achieved. We also assume that one's goals influence how the behaviour of other people is interpreted.

A considerable number of studies have investigated student goals in higher education (e.g., Litmanen, Hirsto, & Lonka, 2010; Mikkonen, Ruohoniemi, & Lindblom-Ylänne, 2013; Pintrich, 2000; Vandewalle, 1997). Based on the work of Pintrich (2000) two goal-orientations are often distinguished: a mastery (also learning) goal-orientation and a performance goal-orientation. However, recently several researchers distinguished more types of goals; work-related, social enhancement and social affiliation goals (Ng, 2008); qualification, study process, study success, and other goals (Litmanen et al., 2010). Indeed, especially given the fact that students working on their master's thesis are in a transitional period in their life (from student to professional), we think a more elaborate view of goals is appropriate, that is a view that includes more than only curricular goals. This is in line with the reasoning of Boekaerts, de Koning, and Vedder (2008) who propose three conceptual frameworks to be used when investigating goals in educational contexts, in order to do more justice to the complexity and variety of goals in education; Ford and Nichols' (1991) taxonomy of human goals to describe the different content of goals that might interact in classrooms, Carver and Scheier's (2000) hierarchical goal model to describe the links that students might establish between different content goals, and Schwartz's (1992) trans-situational value structure to examine contextual effects on goal orientation and engagement. As this study explores the content of goals, Ford and Nichol's taxonomy was used in addition to a framework for curricular goals.

Curricular goals

In order to describe curricular goals, we chose to use the Dublin descriptors. These describe the generally expected attributes of students who have completed a Bachelor's, master's or doctoral degree. For each qualification attributes are described in terms of 'knowledge and understanding', 'applying knowledge and understanding', 'making judgments', 'communication', and 'learning skills'. We consider these five attributes to be highly relevant for master's thesis projects. The Dublin descriptors framework was developed as part of the Bologna process which aims, among other things, to improve the compatibility, comparability and competitiveness of higher education institutions across Europe (Gänzle, Meister, & Kind, 2009). These shared goals were developed in the form of the

Dublin descriptors (Joint Quality Initiative, 2004). We will use the framework, because we think it is a suitable overview of curricular goals in higher education (see Table 5.1).

Taxonomy of human goals

In order to describe goal content, Ford and Nichols developed a taxonomy of human goals (1987; 1991; 1992; 2007; see Table 5.2). In this taxonomy a distinction is made between within-person goals on the one hand, referring to the person themselves, and person-environment goals on the other hand, referring to the relationship between person and environment. The within-person goals are subdivided into affective goals, cognitive goals, and subject organization goals. The person-environment goals are subdivided into self-assertive social relationship goals, integrative social relationship goals, and task goals.

Relating the goals in this taxonomy to distinctions made in goal-orientation research, a performance goal orientation can be seen in categories such as individuality, superiority, and resource acquisition. Work-related goal orientation can be seen in the resource provision category, social goals are also represented in the taxonomy. There is also a category labelled *mastery*, however, in goal-orientation literature mastery is described as a focus on the learning of a skill (e.g., Pintrich, 2000), whereas in this taxonomy mastery it is also about meeting a challenging standard. Applied to an educational context, meeting the standard indicates achieving a sufficient grade in order to pass. Cognitive goals are also described: exploration, understanding, intellectual creativity, and positive self-evaluations. However, instead of using these general cognitive goals to describe supervisor and student goals in a master's thesis project, we use the Dublin descriptors framework. We thus replace the cognitive goals of the taxonomy for human goals with the Dublin descriptors framework.

Student and supervisor goals in master's thesis projects

With respect to student goals, Anderson et al. (2008) interviewed fifteen professional part-time students involved in a master's thesis project, and found three categories of goals that were all intrinsic in nature: a strong wish to advance practice through the results of the thesis (practice intrinsic), a desire to make intellectual progress (academic research intrinsic), and a satisfying sense of personal involvement, development and/or change (personal intrinsic). In contrast, based on 72 student interviews Ylijoki (2001) described four narratives about the way students experienced their master's thesis projects; heroic, business-like, tragic, and penal. In the 'penal' narrative, she describes students who do not understand why a thesis should be written in the first place. These students experienced their thesis merely as punishment. The findings of both Anderson et al. and Ylijoki suggest that students can have different views on, and goals for, a master's thesis.

With respect to supervisor goals Anderson et al. (2006) interviewed 13 supervisors who had a local reputation for competence. Their main goals for students were to align them to the routines of the research community by disembedding them from the assumptive world of everyday contexts, adopting an open and questioning perspective, and to encourage them to follow academic conventions in order to be able to actively defend their stance on a topic. Furthermore, the supervisors interviewed wanted their students to exercise responsibility for progressing the thesis and to show commitment to their project. Some supervisors found it important that the thesis had an impact on practice, even

though others found the student development towards achieving a critical and reflective intellectual stance to be the most salient goal of the thesis process. In general, no specific differences between disciplines were found in previous research (e.g., Anderson et al., 2006; Ylijoki, 2001).

In these previous studies concerning student and supervisor goals, independent groups of students and supervisors were sampled. In the present study supervisors and students are selected in dyads, in order to gain insight into the nature of and variation in goals of dyads that actually are working together on a master's thesis project. Furthermore, goals were studied bottom up, whereas in this study existing goal frameworks are used.

5.2 Methods

Participants

Supervisors with a local reputation for being good supervisors were invited to participate in the present study. In order to generate some variance between these good supervisors, we included supervisors from three faculties of a large Dutch university; Social and Behavioural Sciences, Geosciences, and Humanities. Fifteen supervisors were selected with a local reputation for being successful in the role of supervisor as indicated by the Dean of the faculty. Twelve supervisors agreed to participate and they each selected one of their master's students who were being supervised at the time and whose supervision process was perceived as being representative. All these students agreed to participate.

Two supervisors and eight students were female. Students were between 23 and 35 years old and had taken part in 1 - 20 supervision meetings at the time of the interview. The supervisors ranged from being PhD students to full professors.

Procedure and instrumentation

For each dyad, we interviewed both student and supervisor separately immediately after a supervision meeting. During these interviews, supervisors were asked what the main goal(s) of a master's thesis project was for them and what they perceived to be the main goal(s) of a master's thesis project for their students. Students were also asked about the main goals of their master's thesis project and what they perceived their supervisor's goal(s) to be. The interview questions were piloted to check their comprehensibility for the respondents.

Analysis

The analysis of the interview data was performed according to the following steps. In order to establish the unit of analysis in the transcribed answers of both students and supervisors to both questions, the goals (both students' and supervisors' own and perceived other's goals) were first selected per person per question. Along with the transcribed answers, these selections were then given to a second and independent researcher, who checked the selections for completeness (are all important elements of the transcribed answer included in the selection?) and visibility (are all elements of the selection visible in the transcribed data?). This resulted in 102 goals in total.

The goals were then coded, using the five Dublin descriptors as a starting point (see Table 5.1). Goals that could not be coded as belonging to a descriptor were coded using the goal taxonomy of

Ford and Nichols (see Table 5.2). We could thus clearly distinguish educational goals from additional personal goals. The data was coded by the first author and a third, independent, researcher. Based on a discussion of these codings some additional coding rules were described in order for reliable coding to be possible. An extra category was described as *imposed/external goal* (e.g., ‘it is just an obligatory part of the educational programme’). Two supervisor goals, as perceived by students, could not be coded with either of the two frameworks because these students described what the supervisors themselves wanted to achieve with a student’s master’s thesis rather than what the supervisors wanted the students to achieve; one student described a perceived supervisor goal as providing the best supervision they possibly could, and another student suggested that the supervisor wanted to make students enthusiastic about becoming one of their PhD students after their master’s. One supervisor also indicated that he found it too difficult to describe the student’s goals as he perceived them.

Finally, the first author coded the data again and codings were compared to the codings of a fourth and independent researcher. This resulted in a Cohen’s kappa of 0.89 for the Dublin descriptors and 0.76 for the Ford and Nichols goal taxonomy.

Table 5.1

Coding scheme based on Dublin descriptors for the master’s level as described by the NVAO

Dublin descriptor	Description of master’s qualification	Example from data
Knowledge and understanding	Has knowledge and understanding, based on knowledge and understanding of the Bachelor’s degree that exceeds and deepens this, and also a basis to make an original contribution to the development or application of ideas, often in the context of research.	‘I want to broaden my knowledge of research.’ (<i>student</i>)
Applying knowledge and understanding	Is able to apply knowledge and understanding in new or unknown circumstance within a broader (or multidisciplinary) context that is related to the field of study; is able to integrate knowledge with complex information.	‘Students should show that they can apply everything they have learned before.’ (<i>supervisor</i>)
Making judgments	Is able to formulate a judgment based on incomplete or minimal information, considering social and ethical responsibilities, that are connected to the application of the own knowledge and judgments.	‘This is the moment that their critical thinking will crystallise.’ (<i>supervisor</i>)
Communication	Is able to communicate conclusions clearly and unambiguously to a public of specialists and non-specialists, as well as the knowledge, motives and considerations that underlie these conclusions.	‘Students should be able to write in an accessible and convincing way.’ (<i>supervisor</i>)
Learning skills	Has the learning skills that put him/her in the position that (s)he can do a follow up programme with a largely self-directed or autonomous character.	‘I want to learn to work independently.’ (<i>student</i>)

Table 5.2

Coding scheme based on taxonomy of human goals (Ford & Nichols, 1991)

		Example from data
<i>Affective Goals</i>		
Entertainment	Experiencing excitement or heightened arousal; Avoiding boredom or stressful inactivity	'For me it's just fun, a hobby.' (<i>student goal</i>)
Tranquillity	Feeling relaxed and at ease; Avoiding stressful over-arousal	-
Happiness	Experiencing feelings of joy, satisfaction, or well-being; Avoiding feelings of emotional distress or dissatisfaction	'I think the student him or herself should be satisfied with the project' (<i>supervisor goal</i>)
Bodily sensations	Experiencing pleasure associated with physical sensation, physical movements, or bodily contact; Avoiding unpleasant or uncomfortable bodily sensations	-
Physical well-being	Feeling healthy, energetic, or physically robust; Avoiding feelings of lethargy, weakness, or ill health	-
<i>Cognitive Goals</i>		
Exploration	Satisfying one's curiosity about personally meaningful events; Avoiding a sense of being uninformed or not knowing what's going on	-
Understanding	Gaining knowledge or making sense out of something; Avoiding misconceptions, erroneous beliefs, or feelings of confusion	-
Intellectual creativity	Engaging in activities involving original thinking or novel or interesting ideas; Avoiding mindless or familiar ways of thinking	'I think my supervisor wants to breed an academic attitude.' (<i>student perception</i>)
Positive self-evaluations	Maintaining a sense of self-confidence, pride, or self-worth; Avoiding feelings of failure, guilt, or incompetence	'Purely to prove to myself that I can write a thesis.' (<i>student goal</i>)
<i>Subject Organization Goals</i>		
Unity	Experiencing a profound or spiritual sense of connectedness, harmony, or oneness with people, nature, or a greater power; Avoiding feelings of psychological disunity or disorganization	-
Transcendence	Experiencing optimal or extraordinary states of functioning; Avoiding feeling trapped within the boundaries of ordinary experience.	-

<i>Self-Assertive Social Relationships Goals</i>		
Individuality	Feeling unique, special, or different; Avoiding similarity or conformity with others	'I think it is important that students really present themselves.' (<i>supervisor goal</i>)
Self-determination	Experiencing a sense of freedom to act or make choices; Avoiding the feeling of being pressured, constrained, or coerced	'I find it important for students to do their own thing.' (<i>supervisor goal</i>)
Superiority	Comparing favourably to others in terms of winning, status, or success; Avoiding unfavourable comparisons with others	-
Resource acquisition	Obtaining approval, support, assistance, advice, or validation from others; Avoiding social disapproval or rejection	'I mean, this is the final judgment on my research skills.' (<i>student goal</i>)
<i>Integrative Social Relationship Goals</i>		
Belongingness	Building or maintaining attachments, friendships, intimacy, or a sense of community; Avoiding feelings of social isolation or separateness	-
Social responsibility	Keeping interpersonal commitments, meeting social role obligations, and conforming to social and moral rules; Avoiding social transgressions and unethical or illegal conduct	-
Equity	Promoting fairness, justice, reciprocity, or equality; Avoiding unfair or unjust actions	-
Resource provision	Giving approval, support, assistance, advice, or validation to others; Avoiding selfish or uncaring behaviour	'She really wants to contribute to the field of practice.' (<i>supervisor perception</i>)
<i>Task Goals</i>		
Mastery	Meeting a challenging standard of achievement or improvement; Avoiding incompetence, mediocrity, or decrements in performance	'They should show that they are little researchers.' (<i>supervisor goal</i>)
Task creativity	Engaging in activities involving artistic expression or creativity; Avoiding tasks that do not provide opportunities for creative action	-
Management	Maintaining order, organization, or productivity in daily life tasks; Avoiding sloppiness, inefficiency, or disorganization	-
Material gain	Increasing the amount of money or tangible goods one has; Avoiding the loss of money or material possessions	-
Safety	Being unharmed, physically secure, and free from risk; Avoiding threatening/depriving/harmful circumstances	-

5.3 Results

Table 5.3 presents students' and supervisors' own goals and their perceptions of the goals of the other actor in the supervision dyad in terms of the Dublin descriptors and the goal taxonomy of Ford and Nichols (1991). In general it was found that with respect to their own goals most supervisors and some students reported more than one goal. Two cells in the table are empty, as this student and supervisor indicated that they could not indicate respectively their supervisor's and student's goal(s).

Student goals and supervisor goals

For the supervisors, 20 out of the 29 supervisor goals fitted one of the Dublin descriptors, whereas for students only 10 out of 24 student and supervisor goals fitted the Dublin descriptors. This suggests that students seem to be less concerned with curricular goals than supervisors. Within the Dublin descriptors, supervisors mainly focused on applying knowledge and understanding, whereas students mainly focused on gaining knowledge and understanding.

With respect to the additional personal goals that were mentioned, resource acquisition was mentioned several times by both supervisors and students. Resource acquisition was mostly described in terms of gaining a diploma or validation that they are capable of doing research. Interestingly, three students also described a within-person (i.e., within-student) goal such as entertainment or positive confirmatory self-evaluations, but none of the supervisors did so. These are rather intrinsic goals. On the other hand, three students described the master's thesis as an imposed assignment that they felt they had to complete, which could be considered as extrinsic.

On a dyadic level, for half of the dyads a shared goal was found, i.e., supervisor and student described the same goal. Still, in these dyads only one goal was shared and in the other six dyads no shared goals were found.

Matches between goals and perceptions

We compared supervisor goals with student perceptions of supervisor goals. In total we found six dyads in which the students correctly perceived one of their supervisor's goals. In two dyads this concerned the goal Applying & understanding, and in the other dyads the correctly perceived goal varied. Surprisingly, none of the students perceived learning skills (working independently) to be an important goal whereas four supervisors described this goal. Connected to learning skills is self-determination, mostly described in the sense that students should feel ownership over their thesis project and should feel the freedom to do what they want to do. No student perceived this to be a supervisor goal, whereas two supervisors described this goal. This seems to indicate that students do not recognise learning to work independently or being the owner of their thesis as an important supervisor goal.

Comparing student goals and supervisor's perceptions of student goals, we found four dyads in which the supervisors correctly perceived one of their student's goals. Interestingly, in three out of the four instances this concerned the goal Resource acquisition, i.e., acquiring a diploma or degree.

Table 5.3

Supervisor and student goals and perceptions represented per supervision dyad

Dyad	Supervisor goals		Student goals	
	Supervisor self-reported goal	Student perception	Student self-reported goal	Supervisor perception
1	Resource acquisition Knowl & Underst Applying & Underst Communication	Applying & Underst	Resource acquisition	Resource acquisition
2	Applying & Underst Learning skills Resource acquisition	Knowl & Underst	Knowl & Underst Learning skills	Resource acquisition
3	Knowl & Underst Making judgments	-	Knowl & Underst Resource acquisition	Effort
4	Knowl & Underst Applying & Underst Mastery	Intellectual creativity Mastery	Resource acquisition	Resource acquisition
5	Applying & Underst Resource provision Resource acquisition	Effort Resource provision	Knowl & Underst Learning skills Mastery	Resource acquisition Mastery
6	Applying & Underst	Resource provision	Knowl & Underst	-
7	Resource acquisition Self-determination	Resource acquisition	Knowl & Underst Pos self-evaluation	Resource acquisition
8	Applying & Underst	Resource acquisition	Applying & Underst Entertainment Imposition	Knowl & Underst Resource acquisition
9	Applying & Underst Learning skills Individuality	Applying & Underst	Applying & Underst Resource acquisition	Self-determination
10	Knowl & Underst Communication	Knowl & Underst Effort	Resource acquisition Mastery Pos self-evaluation	Resource acquisition Knowl & Underst
11	Self-determination Applying & Underst Learning skills	Mastery Happiness	Self-determination Resource acquisition	Resource provision
12	Applying & Underst Learning skills	Resource acquisition	Knowl & Underst Self-determination	Resource acquisition

Note. **Bold** indicates supervisor and student have this goal in common; Shades indicate goal and perception are the same. A minus (-) indicates missing data.

5.4 Discussion

Related to the *first research question* concerning student and supervisor's own goals, we expected that in master's thesis projects not only curricular goals (as described by the Dublin descriptors) would play a role for the students, but also other personal goals. Indeed we found that part of the supervisor and student goals could be described in terms of the Dublin descriptors, mainly knowledge and understanding, the application of knowledge and understanding, and learning skills. In addition, a substantial number of goals were found to be personal goals. And relatively, for students we found more personal goals than for supervisors. So confirming our expectation, we found that goals in a master's thesis project go beyond curricular goals such as the Dublin descriptors, and therefore empirically confirm the suggestion of Boekaerts, de Koning, and Vedder (2006) that goals in education should not only be addressed from a curricular or educational perspective, but also from a perspective beyond that. This might be specifically important in the context of master's thesis projects as students are in a transitional phase from being a student pursuing curricular goals, to becoming a professional pursuing personal goals.

Furthermore, other studies have found or argued that three prominent goals of the master's thesis are assessment, learning, and self-regulation (Anderson et al., 2006; de Kleijn et al., 2012; Todd et al., 2004; Nelson, 1997; Sachs, 2002). These three goals were also found in the present study, but can be described more specifically given the detailed coding schemes; assessment was found in terms of the thesis being an imposed or external goal and being a way to acquire a degree (a resource) with which to enter the labour market; learning was found in the Dublin descriptors, which specify *what* should be learned, which was mainly knowledge and understanding and/or the application of knowledge and understanding; and self-regulation was found as a learning skill to be learned and as self-determination. Thus, our findings confirm the goals that were described in previous studies, but more importantly provide a more nuanced view of how students and supervisors talk about these goals and shed light on other goals that can be pursued, such as resource provision, imposition and positive self-evaluations. Furthermore, Ford and Nichols' (1991) taxonomy of human goals proved to be a valuable instrument for analysing students' and supervisors' goals in higher education that go beyond a curricular perspective.

Concerning the *second research question* which addressed similarities and differences between supervisor and student goals within and between dyads, some similarities but mainly differences were found. In half of the dyads we found one shared goal. Not having shared goals, might be problematic since, as described before, working towards different goals could potentially lead to misunderstanding and miscommunication (Collier & Morgan, 2008; Lovitts, 2007). More specifically, students focus mainly on knowledge and understanding whereas supervisors often focus on applying knowledge and understanding. This corresponds to the study of Murtonen, Olkunuora, Tynjälä, and Lethinen (2008) who found that students from the USA and Finland are not convinced that they will need research skills in working life, and therefore might focus more on learning new content and understanding theories rather than applying them in a research project. In addition, both students and supervisors see the thesis as a way to acquire resources, and some students see the thesis mainly as an imposed task.

The *third research question* concerned the relationship between supervisor and student goals on the one hand and the corresponding perceptions of their goals on the other hand. Our findings indicated that student's and supervisor's goals are sometimes perceived as such by the other, but that a lot of supervisor and student goals are not known by the other half of the dyad. Apparently, students do not seem to be aware of the fact that supervisors want them to work rather independently and that knowledge and understanding should not only be *gained* but most importantly should be *applied*. Here we might have an explanation for an earlier finding, that feedback is rarely perceived as goal-related (de Kleijn et al., 2012), as students seem to have no clear idea of what is expected of them. This might turn out to be problematic as Collier and Morgan (2008) stressed the importance of students understanding what professors expect of them, as student performance is ultimately graded by the supervisor (although in consultation with a second and independent assessor).

Conclusion

We conclude that in master's thesis projects, supervisor goals, but more importantly that student goals exceed the scope of curricular goals and also include personal or human goals. This can be explained by students engaging in a transition from being a student to becoming a professional, which indicates that the timing of the thesis can be seen as complex. Secondly, we conclude that supervisor goals seem to have somewhat different focus compared to student goals, with students focusing more on gaining knowledge and supervisors focusing on applying knowledge. Still, in several instances supervisors and students do pursue a shared goal. Thirdly, we conclude that supervisors and students perceive each other's goals correctly in only a few cases. This might be worrying as the supervisors in this study had a local reputation of being good supervisors. Even though some supervisors correctly perceive that students want to get a diploma, they do not recognise the students personal goals. In general, the results of this study suggest that providing goal-related feedback in the context of master's thesis projects might not be as straightforward as in the context of secondary education or courses in higher education in which the tasks are less complex, and the goals more clear.

Limitations and implications

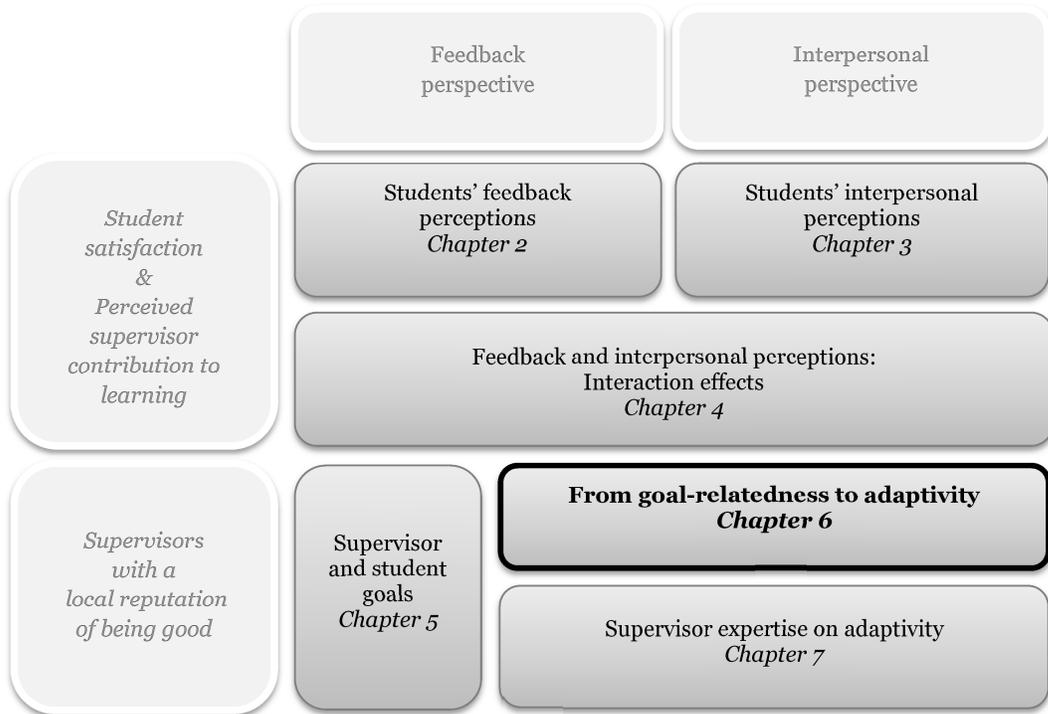
Despite the interesting and sometimes surprising findings of this study, some limitations need to be addressed. In the present study only a small sample was included from one university in the Netherlands, but we did include students from three departments. As students from different fields of study can have different life goals (García-Aracil, Gabaldo, Mora, & Vila, 2007; Mikkonen et al., 2013), it is also possible that they have different goals in relation to a master's thesis. In addition, the supervisors participating in this study were selected because of their local reputation for being good supervisors. For these two reasons, our findings cannot be generalised to other departments, universities, countries, or supervisory settings. Future studies need to investigate this set of goals further in other, preferably larger and more heterogeneous samples. The results of this study therefore, should be considered to represent a single instance of student and supervisor goals as pursued and perceived.

Students and supervisors were interviewed only once, and in different phases of the thesis project. This indicates that the presented findings resulted in an instantaneous sample, which might be oversimplified as Ford (1992) indicated that goals can change over time.

Despite these limitations, some practical implications can be drawn from this study. Our findings indicate to some extents an incongruence of goals for supervisors and their students, implying that communication about goals should be enhanced in thesis projects. More specifically, as our findings indicate that students often do not have a congruent idea of their supervisor's goals, it seems important for supervisors to pay (even) more attention to discussing and aligning their goals with students. The first supervision meeting is potentially a good time to discuss curricular, supervisor, and student goals. However, this might not be enough, as goals might change over time. Therefore, we deem it important that goals are explicitly addressed on a regular basis during the supervision process, by linking feedback explicitly to the various and sometimes evolving goals. Also, it might be beneficial for students if supervisor feedback is related not only to curricular goals, but also to personal goals as students do not only pursue curricular goals but may have various personal goals for which they strive. This is not surprising, given the fact that master's thesis students are in a transitional phase from student to graduate and most likely will enter the labour market soon after graduating.

Quality of supervision

Perspectives on master's thesis supervision



Chapter 6

From goal-relatedness to adaptivity⁵

Despite the importance of goals in educational theories, goals in master's thesis projects are rarely investigated. Therefore, this study aimed to explore how goals play a role in master's thesis supervision in terms: what are the goals (up-component)?; where does the student stand in relation to the goals (back-component)?; and how can the student more closely reach the goals (forward-component)? Twelve supervisors and students were interviewed and the adaptive approach of supervision emerged as a recurrent theme. Applying qualitative content analysis, the findings indicated that the role of goals can be described as aiming to reach the goals (up-component) based on students' specific needs and on where they stand (back-component), and by adapting the support strategies (forward-component), which was termed 'adaptivity'. Providing adaptive supervision can also involve tensions concerning the level of regulation and the strength of criticism. Findings are discussed in relation to other studies concerning research supervision.

⁵ This chapter has been submitted for publication in adapted form as: Kleijn, R.A.M. de, Bronkhorst, L.H., Meijer, P.C., Meijer, Pilot, A., & Brekelmans, M. (*submitted*). Understanding the up, back, and forward-component in master's thesis supervision with adaptivity.

6.1 Introduction

Most academic master's programmes are completed with a master's thesis project, which can be described as a research project that students undertake independently. These projects have some specific characteristics compared to general coursework in terms of duration, focus, teacher-student interaction, and goals. First, the *duration* of a master's thesis project is often at least half a year, with a minimum weight of 15 European Credit Transfer and Accumulation System Credits (ECTS), whereas a course usually lasts about three months with a weight of 7.5 ECTS. As the student works on one project throughout these six months, this leads to the supervision process being more cyclical rather than linear because the same piece of work is discussed in each meeting. Second, the *focus* of the research that is carried out in a master's thesis project is determined to a large extent by the student, both in terms of topic and research design. Unlike most coursework assignments, this implies that both the student and the supervisor do not know beforehand what the results of the research will be. Third, the *teacher-student interaction* in coursework can usually be characterised as one-on-many as usually there is one or a couple of teachers and a large group of students. The teacher-student interaction in master's thesis project, on the other hand, can be characterised as one-on-one. Although in several places explorations with group supervision are described (e.g., Dysthe, Samara, & Westrheim, 2006), one-on-one supervision still seems to be the most common form of supervision. Fourth, in coursework there tends to be a clear distinction between assignments that are intended to support learning (for instance, assignments during tutorials) and assignments that are intended to assess learning (that is assignments that are graded). The master's thesis, however, has the curricular *goal* of supporting and assessing student learning at the same time, which could be seen as rather complex (Todd, Bannister, & Clegg, 2004). For supervisors, this means that they should support students in their learning process, but they also need to assess the quality of the thesis in the end.

Of these four characteristics, most studies in the context of master's thesis projects concern the supervisor-student interaction (e.g., Dysthe, 2002; de Kleijn et al., 2012) or the students' and supervisors' general experience and evaluation of supervision (e.g., Anderson, Day, & McLaughlin, 2006, 2008; Drennan & Clarke, 2009). Goals in master's thesis projects are rarely researched, which might be considered surprising giving the prominence of goals in several educational theories such as goal-orientation theories (e.g., VandeWalle, 1997), self-regulation theories (e.g., Pintrich, 2000), and feedback theories (e.g., Sadler, 1989).

However, goals of master's thesis projects are addressed in some studies. Regarding the *type* and *nature* of goals in master's thesis projects, Anderson, Day, and McLaughlin (2006) concluded that supervisors' main aim of thesis projects is to ensure the values of the research community guide the students' practice. From a student perspective, they found that part-time students had three types of goals with the research projects: advancing practice, making intellectual progress with a commitment to academic standards and values, and gaining a satisfying sense of personal involvement, development, and/or challenge (Anderson, Day, & McLaughlin, 2008). In addition, in a previous study (de Kleijn, Meijer, Brekelmans, & Pilot, 2013) we distinguished curricular goals from personal goals in the context of master's thesis projects. With respect to the *importance*, in another earlier study (de Kleijn et al., *in press*) we investigated 1016 students' feedback perceptions in the context of master's thesis projects, and found that feed back (how am I going?) and feed forward (where am I

going?) were strong predictors for student satisfaction and perceived supervisor contribution to learning. Feed up (goal-setting) was also found to predict these outcome measures, yet it appeared that students perceived only little feed up.

Even though these findings provide some insights into the type and nature of goals in master's thesis projects and their possible importance, it remains unclear *how* supervisors and students work towards reaching these goals. In order to fill this theoretical gap, the present study investigates goal-relatedness of supervision by means of accounts from supervisors with a local reputation of being good.

Goal-relatedness of supervision

As described above, goals play an important role in several educational theories. Following Sadler (1989), we conceptualise a goal as a designated degree of performance or excellence that is desired, aimed for, or aspired to. In the context of research supervision, these can be curricular goals (e.g., gaining knowledge and understanding) and/or personal goals (e.g., getting a diploma or providing policy recommendations) of the student and/or the supervisor (de Kleijn et al., 2013). Sadler (1989) describes that goals have the greatest impact on performance when they are specific and clear, hard and challenging, and close to the upper limit of an individual's capacity to perform, because such goals focus attention, mobilise effort, and increase persistence at a task (e.g., Locke & Latham, 2002). In addition, based on the work of Carver and Scheier (2001), we assume that these goals play a role on three levels: the master's thesis project as a whole, the supervision process, and individual supervision meetings.

Subsequently, we approach the concept of goal-relatedness from a feedback perspective by viewing it as the extent to which supervision supports the student in closing the gap between their current performance and their goals. In this respect, Sadler (1989) explains that if the gap between a learner's current status and the goal is too small, it might not motivate the learner to put additional effort into reaching it. Conversely, if the gap is too large, the learner might perceive the goal as unattainable and therefore this would not encourage increased effort and persistence. Therefore, Sadler (1989, p.130) suggests that 'the teacher may find it useful to negotiate the aspiration level with the student, or at least to take individual student characteristics into account'. However, in order to close this gap, knowing the goals does not suffice, as closing the gap would also require the comparison of the current performance to the goals by applying standards and criteria (Sadler, 1989). As well, when the gap is determined, its closing can be supported by deciding on appropriate moves or strategies to bring the performance closer to the goal. Generally, this is seen as the task of the supervisor, but Sadler argues that ultimately the students themselves should be able to do so.

In line with this reasoning, Hattie and Timperley (2007) addressed three comparable elements of feedback which they termed feed up (where is the learner going?/what are the goals?), feed back (how is the learner going?/how does the learner's performance relate to the goals?), and feed forward (what's next?/what steps does the learner need to take in order to more closely reach the goals?). They found that feedback should provide answers to these questions in order to promote student learning and performance. Therefore in exploring how goal-relatedness can be described in supervision, we

refer to these three information components as the up-component, the back-component, and the forward-component.

Present study

In this study, we set out to study master's thesis supervisors with a local reputation of being good supervisors, as we assume that good supervisors have considerable knowledge about the role of goals in supervision. This will not only increase our understanding of goal-relatedness in supervision, but also enables us to provide practical implications for supervisors in general. Therefore, the present study addresses the following research question: *How do expert supervisors describe goal-relatedness in their master's thesis supervision and what are their considerations in this respect?*

6.2 Methods

Participants

Fifteen supervisors with a local reputation of being good supervisors were invited to participate in the present study. We opted to include supervisors from three faculties of a large Dutch university as their master's thesis projects are similar: Social and Behavioural Sciences, Geosciences, and Humanities. The Deans of the respective faculties indicated which supervisors were considered successful in their role. Twelve supervisors agreed to participate and they each selected a master's student they supervised at that moment, whose supervision process was perceived as being representative. All students agreed to participate. Two supervisors and eight students were female (see Table 6.1). Students were between 23 and 35 years old and had taken part in 1-20 supervision meetings at the time of the interview. The supervisors ranged from being post-doctorates to full professors. For each dyad, we interviewed both the student and supervisor separately immediately after a supervision meeting.

Table 6.1

Characteristics of participating supervisor-student dyads

Dyad	Department	Supervisor gender	Supervisor position	Student gender	Student age	No. of meetings
1	GEO	M	Full professor	M	25	4
2	HUM	M	Associate prof.	M	25	1
3	SBS	M	Associate prof.	F	24	6
4	HUM	M	Associate prof.	F	24	12
5	HUM	M	Assistant prof.	M	32	2
6	GEO	M	Full professor	F	23	20
7	SBS	M	Assistant prof.	F	26	5
8	GEO	M	Assistant prof.	F	24	10
9	HUM	M	Full professor	M	35	6
10	HUM	F	Assistant prof.	F	26	4
11	SBS	M	Post-doc.	F	24	5
12	GEO	F	Assistant prof.	F	28	5

Note. GEO = Geo sciences; HUM = Humanities; SBS = Social and behavioural sciences.

Instruments

In order to explore supervisor and student experiences of goal-relatedness of supervision in master's thesis projects, an interview scheme was developed based on the presented theoretical framework (see Appendix 1). We included goals of the master's thesis, goals of the supervision, and goals of a specific meeting. Questions labelled with an A refer to the up-component, and accordingly questions with the labels B and C refer to the back- and forward-component, respectively. As supervision is an interaction between supervisor and student, we included questions about their own goals and their perception of each other's goals. Also, for both perspectives we included questions concerning how they give notice of their goals and how they signal each other's goals.

The interview scheme was piloted using a think aloud procedure and by having test interviews with both students and supervisors who were not included in the final sample. This verified the comprehensibility of the interview scheme as a whole, as well as the individual questions. All interviews were audio-recorded and fully transcribed.

Analysis

Initially, the first author intensively read the interview transcripts multiple times. From these readings, a recurrent theme in the supervisor interviews seemed to be the adaptive approach of the supervision. Therefore, the interviews were read again in order to confirm this preliminary theme as being recurrent and relevant. Indeed in all supervisor interviews and in all but one student interviews, fragments were found in which the concept of a supervisor handling differences between students by adapting his/her supervision to a specific student was addressed.

Subsequently, the adaptive approach of supervision (later referred to as adaptivity) was used as a sensitising concept (e.g., Bowen 2006) for selecting fragments from the supervisor and student interviews to answer our research question. From this selection, five categories emerged from the supervisor interviews and two categories from the student interviews (see Table 6.2). The interviews were read again in relation to these categories in order to check whether all relevant fragments were included. No fragments could be selected from supervisor Mark (dyad 8). This can be explained by his indication of deliberately not providing adaptive supervision⁶.

The selected fragments were then organised in a role-ordered matrix (Miles & Huberman, 1994). Subsequently we found that in supervisor and student accounts of adaptive supervision, a distinction could be made between general descriptions and concrete examples of adaptivity and we considered it helpful to include both in order to illustrate the concept of adaptivity. Therefore, we made this distinction in the columns of the matrix; the rows represented the supervisor-student dyads (see Table 6.3). The data from the student interviews were used to triangulate and complement the supervisor data (Johnson, 1997). First, based on the column 'supervisor description of adaptive character of supervision', the first author described adaptivity as a way of describing the role of goals in master's thesis supervision, which was then complemented with additional information in the column 'student description of adaptivity'. Second, the columns 'supervisor concrete example of adaptivity' and

⁶ This supervisor said: 'You can say you have to empathise with the one who is in front of you and you have to make knowledge available on their/his/her level, whatever. And then I think 'no'. [...] As a student you have to deal with different kinds of teachers and supervisors and it is up to you to get what you need'.

‘student concrete example of adaptivity’ were analysed and summarised, which led to a further exploration of the concept of adaptivity as a way of describing goal-relatedness in supervision. Lastly, the column ‘supervisor consideration concerning adaptivity’ was analysed and summarised in order to understand the reasoning of supervisors with respect to providing adaptive supervision. These considerations are presented in terms of two tensions in relation to the goals of a master’s thesis. All the steps of the analyses were performed by the first author and in order to promote transparency, results were extensively discussed with the third author. To increase validity, the relation between the results and the theoretical framework was explicitly discussed with the second author. All names used in the result section are pseudonyms.

Table 6.2

Categories that emerged from the interviews

Supervisor interviews
<i>Describing goal-relatedness</i>
Indication of adapting supervision to different students
Indication of what kind of student a specific student is
Indication of differences between students
<i>Considerations</i>
Indication of why (s)he supervises the student in a specific way
Indication of the extent to which a supervisor has an interest in/knows the personal situation of a student
Student interviews
<i>Describing goal-relatedness</i>
Indication/example of supervisor adapting supervision to the individual student
Indication of what a supervisor knows about the student

Table 6.3

Columns of the role-ordered matrix and order of analyses

<i>Describing goal-relatedness</i>
Supervisor description of adaptivity (general)
Student description of adaptivity (general)
Supervisor concrete example of adaptivity
Student concrete example of adaptivity
<i>Considerations</i>
Supervisor consideration concerning adaptivity

6.3 Results

Describing goal-relatedness: adaptivity

In the master's thesis projects, the supervisors do not have different goals for different students, but the way in which they try to reach these goals varies as students differ from each other. This is, for instance, illustrated by supervisor Harry:

'In that respect, these are kinds of meta goals. And in fact, I have applied them to every thesis and student as long as I have been doing this work. You colour each of them individually within a project, for a student or for a dyad. One [student] takes it up better than the other, one can handle criticism better than the other, one works more independently than the other, so you adapt it to the person. [...] But the main goal remains the same.' (*Supervisor Harry, dyad 3*)

Thus, supervisors do not differentiate the up-component per student on the level of the thesis as a whole. Several supervisors, when they were asked how they saw the main goals of the master's thesis and of the supervision, explicitly addressed that they adapt their supervision to their perception of the needs of each specific student. In other words, adaptivity mainly is about shaping the forward-component based on the back-component. For instance, in the following excerpt, supervisor Steve indicates that he aims for students to learn from the project and he explains how he tries to support that:

'You see, there are formal goals, but what I find very important for a master's thesis project is that students make progression. That I really feel that they are learning. So I always try to... for instance what I do is, the feedback that I give, I try to adjust it to my estimation of a student's level. I try to give feedback in a way that I feel they learn maximally from this.' (*Supervisor Steve, dyad 11*)

In line with this, supervisor Sandy explains that for her the goal of master's thesis supervision is to provide custom-made supervision:

'Well, that differs per student. So I don't think you can say very unambiguously what supervision should be. Therefore, for me supervision is also about discovering what there is to supervise. It's providing tailor-made supervision.' (*Supervisor Sandy, dyad 10*)

Supervisor Tom uses a chameleon metaphor to explain the goal of his supervision:

'Well, I think you have to realise, as a supervisor I show chameleon-like behaviour. You see, Parker is a bright student, he understands it. But he is somewhat easy-going, so I show a certain type of supervision behaviour. When I have a less bright student in front of me, I show rather different supervision behaviour.' (*Supervisor Tom, dyad 1*)

Interestingly, when asked about what he thought his student expected of him, supervisor Otto said:

'(short silence) What does she expect from me? Ehm... I find it hard to identify that. Ehm because my frame of reference is actually what I provide myself. So I don't have that many ideas about what the student expects from me, other than what I think I should give the student. [...] I could not think of anything else actually, ehm... Yeah I think someone expects wisdom and experience from me, hahaha. Anything else, I don't think I would be willing to give.' (*Supervisor Otto, dyad 6*)

We consider this approach to indicate a crucial element of adaptivity as a way of describing goal-relatedness: it is not just adapting supervision to the *expectations* of the students in order to make the

student happy, but adapting the supervision to what you think a student *needs in order to reach the goals (learn and progress)*. This indicates how goals play a role in supervision. Otto is rather clear that he thinks he knows best what a student needs, irrespective of what the student would prefer. This is supported by Otto's other fragments, in which it becomes clear that he adapts his supervision (e.g., strength of criticism) to what he thinks a student can handle.

Several student interviews confirmed the adaptive approach of the supervision that appeared from the supervisor interviews. For instance, student Nena describes how she thinks her supervisor sees the goal of supervision:

'For each student I think very differently. It is a rather small master's programme, so he knows us all quite well. [...] I think he has a rather different approach for everyone.' (*Student Nena, dyad 4*)

Another example is student Patrick. When asked about how he gives notice of his goals, he said:

'He listens carefully to the needs, so to speak. I do have the idea that he senses what kind of student I am, and he does provide me the opportunity to indicate that myself.' (*Student Patrick, dyad 5*)

Concrete examples of adaptivity to describe goal-relatedness

Most supervisors, in one or more instances, mentioned specific support of a specific student. Three supervisors indicated that they adapted the *strength of criticism* to their goals or the students' goals. For instance, supervisor Otto indicated that he thought the goal of his student for that specific meeting was to hear that her thesis was of a satisfactory level. Even though he thought that her thesis had not yet reached this level, he adapted his strength of criticism:

'I think she had the goal of: 'well this [version] could be sufficient'. [...] I did take that into account in that sense, because I know Andrea comes across as a very tough girl who is socially very intelligent. But I just know from her that she is vulnerable too. [...] So I do pay extra attention during such a meeting whether eh, whatever one gives in terms of critical remarks is not too strong.' (*Supervisor Otto, dyad 6*)

In addition, supervisor Ingrid adapts the strength of criticism to what she thinks the goal of her student is, but she offers her student more rather than less strong criticism:

'But I always have had the idea that she wanted to pick up as much as possible, not only regarding the new literature and the literature related to urban geography, but also the analyses of interviews. Just learning as much as possible. [...] I do have the idea that I have to be sharper with her than with other students, because they settle for... [...] Yes I am more critical with her and I also try to make sure that I have some extra literature or ehm, that I tell her something about qualitative research methods for instance, or that I give her a book to read. So I do go and look for additional material, just because she herself already introduces so many things.' (*Supervisor Ingrid, dyad 12*)

In addition, several supervisors indicated that for their specific student they were *more regulating in terms of content or process* as they thought the student would otherwise fail to reach the standards for a master's thesis:

'I think, Parker is one of the more easy-going ones. And that means that if you do not push him, then he can be such a dreamer and above all do many other interesting things. And then he is not bothered with this. [...] So for him I always have set strict deadlines. And he then says: 'well can't I do it a bit later?' [...] and then I call out: no you can't, you should just work a bit harder.' (*Supervisor Tom, dyad 1*)

'Nena is a student who is not that gifted, who already in her bachelor programme experienced troubles to really focus on the study material. Someone that really needs a guiding hand, otherwise nothing will happen.' (*Supervisor Walter, dyad 4*)

Several concrete examples of adaptivity were also described in the student interviews. For instance, several students indicated that their supervisor explicitly asked for certain information that they then used to shape their supervision, such as '*what are your pitfalls?*', '*how are you doing?*', '*what are the good and weak points [of your work], do you think?*' This shows how supervisors collect information about where the student is (back-component) in order to provide adapted advice (forward-component). Also, students commented that supervisors sometimes explicitly described the students' characteristics that they observed (back-component; '*You're so creative*'; '*You tend to extend things a lot*'; '*I think that is typically you, because I have read that several times now*') to underpin their suggestion for improvement (forward-component). Lastly, some students indicated that their supervisor was able to adapt the supervision to their specific needs, as the supervisor already knew him/her. For instance:

'I have known Smit for a long time by now, from my first year in college, because he then already taught courses I took. And he has supervised my bachelor's thesis as well, so he knows me very well and he knows exactly what my pitfalls are.' (*Student Nena, dyad 4*)

Supervisors' considerations concerning adaptivity

We found that in order to provide adaptive supervision, in some instances, supervisors have potentially conflicting considerations. We summarise these considerations in terms of two tensions that are related to the previously mentioned strength of criticism and level of supervisor regulation.

The first tension concerns situations in which a student is barely able to reach the goals of a master's thesis project, and therefore would require more regulation from the supervisor than the supervisor deems appropriate in light of the goals. For instance, supervisor Walter supervised a student whom he doubted had the ability to complete the thesis, but he found it difficult to fail the student:

'You have to concentrate to do it, it requires power, it takes force, you would need to recharge for that. I don't think she can do it. So we'll see. I wonder whether she can do it. [...] Nena is a problem child for someone like me. That little engine has got to be running and if that doesn't work I am through talking. I can't do anything because I won't do it for her. And then you'll have such a student who after six years still has not... that's very irritating. On the other hand, you can't just give someone a passing grade when actually it is not satisfactory. Those are very difficult considerations.' (*Supervisor Walter, dyad 4*)

Comparably, supervisor Sandy also described that in some situations she helps students more than she would want to, as otherwise these students will not reach the goals:

'And I just said that it should not be the case that I am thinking for the students, but unfortunately there are situations which necessitate you as a supervisor to act in a very steering way to make sure that there is at least some outcome. Also, because meanwhile they have come thus far into the programme, that, specifically related to the master it hardly ever happens that you say: 'you know, this is not going to work'. You cannot just ... In that case at some earlier point a mistake had been made. Either someone has passed the bachelor's programme undeservedly, or the admission interview hasn't been critical enough. Therefore at a certain

point, if someone gets there, then you go out of your way to guide him to the finish.’ (*Supervisor Sandy, dyad 10*)

On the one hand, the second tension concerns the supervisors’ notion that students ‘need’ critical comments in order to reach the goals, but on the other hand it involves the consideration of how critical the comments can be without undermining a student’s motivation. Earlier we already saw that supervisor Otto took into account whether his comments were too heavy, but he immediately added the following:

‘By the way, that should never be overdone, that consideration. Otherwise no one will ever get better, but you have to keep it in mind.’ (*Supervisor Otto, dyad 6*)

This indicates that he thinks that failing to provide enough critical comments would be a detriment to the learning process. Also, supervisor Walter struggled with how critical his comments could be:

‘But you can address someone in such a way that he just gets discouraged and doesn’t do anything anymore, so that is difficult... not [to be] sour or strict, but try to encourage. It is very difficult to find that balance. I’m not sure whether I have succeeded in that.’ (*Supervisor Walter, dyad 4*)

Several supervisors connected this consideration to the extent to which they would become concerned with the personal situation of a student. For instance, the following supervisor argued that he was afraid that a relationship that was too personal would jeopardise the objectivity of his judgment:

‘But I’m not, I’m not like eh shall I take you by the shoulder and ask how you are. That empathy thing. I don’t do it. I find it a bit, it distracts. After all this process concerns content matter. [...] It’s the same for student assistants, [...] I always make sure I don’t supervise them. Because, you do build a confidential relationship with them, and I don’t like such supervision. [...] Well I’m afraid that too much subjectivities are included in my judgment. [...] So I see it as a matter of fact or a factual thing. And I have to be able to say those things and therefore it should not be mingled with subjectivities. That’s why I want to keep a distance. Whereas that doesn’t mean I am a cold hearted person, but in fact you can also have a pleasant distance.’ (*Supervisor Otto, dyad 6*)

Interestingly, supervisor John indicated that he finds it important to have a personal relationship, but he also acknowledged the danger of not being able to provide critical comments:

‘What I would like to say is that I find, [...] the personal relation always very important, that you can get along with each other. [...] I always try, well not personal, well actually it is personal, that the distance between student and teacher is not too large. I like being close, let’s put it that way. [...] On the other hand, it brings the danger of not being able to be critical enough, or strict enough. That also holds true for trying to put things in terms of advice, suggestions, rather than in terms of rejection, severe sharp criticism.’ (*Supervisor John, dyad 9*)

6.4 Conclusion and Discussion

With this study we aimed to provide insight into how expert master’s thesis supervisors describe goal-relatedness in master’s thesis supervision and how this is perceived by their students. We conceptualised goal-relatedness of supervision by means of three information components that are needed to reach a goal (Sadler 1989) and, based on Hattie and Timperley (2007), we referred to these as the up-component, the back-component, and the forward-component. In conclusion, our findings

suggest that most supervisors aim to supervise all students in such a way that they reach the goals of learning and completing a master's thesis of sufficient to high quality (up-component). Subsequently, they provide supervision that is adapted to what they think a student in a specific situation (back-component) would need in order to reach these goals (forward-component), in terms of regulation and critical comments. This way of describing goal-relatedness in supervision was conceptualised as adaptivity. Several students recognised this adaptivity and indicated that supervisors sometimes ask for information or make an observed student characteristic explicit (back-component) in order to underpin their suggestions (forward-component). However, we also found that providing adaptive supervision can lead to tensions that are related to the supervision strategies used, in terms of the level of supervisor regulation and the strength of criticism (forward-component). In addition, tension is also associated with the extent to which supervisors can/want to provide this regulation and criticism and the extent to which students need/can handle this with respect to reaching their goals. Sadler (1989, 130) already hinted in this direction when he stated that teachers 'may find it useful to negotiate the aspiration level with the student, or at least to take individual student characteristics into account'. In fact, our findings shed new light on the nature of adaptivity and the concurrent considerations of supervisors.

Concerning the *nature* of adaptivity in supervision, we introduced that adaptivity is about adapting to what students need in the eyes of the supervisor, given their performance and possibly other characteristics, in order to meet the goals of a master's thesis project; adaptivity is not about adapting to just any students' preferences and wishes. As suggested by Halse and Malfroy (2005), adaptive supervision thus requires some sort of interest in the student and his/her situation in order to adapt the supervision accordingly. However, to establish goal-relatedness in supervision, the involvement with the student should have a function in the context of the learning process or improvement of the product. In doing so, supervisors not only adapt their supervision to their own goals, but also to what they perceive as the student's goals. We found that these supervisors adapt to their own or to students' goals by, for instance, adjusting the extent to which they regulate the student and the strength of their critical comments. To achieve this, from the student interviews we learned that these supervisors collect information about the students and about how they are doing, for instance concerning their perception of their pitfalls and the quality of their work. In other words, they collect information in order to have a clear view on the back-component, where the student stands. Consequently, to underpin their adaptive support or forward-component, they sometimes explicitly described a student's characteristics that they observed. Also, the fact that supervisor and student already knew each other before the master's thesis project started could facilitate this back- and forward-component. Interestingly, in other studies in which research supervisors were interviewed, one of the shared themes was that supervisors were responsive to the students as persons, as well as receptive to their circumstances (Anderson, Day, & McLaughlin, 2006), that supervisors varied the level and type of support from student to student (Todd, Smith, & Bannister, 2006), and that research supervision included being interested in the students and responsive to their needs (Halse & Malfroy, 2010). Nevertheless, other than concluding that it is a shared practice among some supervisors, to the best of our knowledge, no study has specifically addressed this issue of

responsiveness or adaptivity, nor has it been described as a process that is related to the goals during supervision.

In addition, our findings also show that providing adaptive supervision can bring about *conflicting considerations* for supervisors that can lead to tensions and therefore adaptivity is not as straightforward as it may seem at first glance. A first tension was the consideration of how critical comments can be. Critical comments have the intention of making clear that strong improvement is needed in order to reach the goals, but without destroying the student's motivation as that would be counterproductive. In other words, this tension reflects Sadler's (1989) consideration of estimating whether a student will perceive overcoming the gap between their current and desired performance as attainable and necessary. This might be influenced, among other things, by students' self-efficacy and the importance that the students attach to a goal (Locke & Latham, 2002). A second tension concerned the extent to which supervisors can and want to regulate the students that are in fact too weak to reach the goals of their master's thesis project without this regulation. This is related to the goals of a master's thesis project and the degree to which students are supposed to be able to finish their projects independently. This suggests that working independently might be another important goal of the master's thesis, or at least a precondition. But it is also related to the boundaries of the supervisor's responsibility. A comparable tension was found by Anderson, Day, and McLaughlin (2006) who recognised that supervisors have both a personal commitment to the student and a commitment as a gatekeeper of academic standards. Our findings showed that some supervisors in this study tend to be more committed to the student than to their gatekeeper role as they find that students can no longer be told to quit the programme after a certain point. The fact that adaptivity was a recurrent theme in all but one of the twelve interviews with supervisors who had a local reputation of being experts suggests the relevance of this concept. As these skilled supervisors shared the adaptive approach to supervision, we suggest that adaptivity might be a desirable strategy. The findings of McClure's (2005) study on Chinese laboratory-based research students in an overseas environment during the first six to eighteen months of their candidature corroborates that students require different supervisory relationships with their supervisor in order to stay on track, ranging from highly dependent to highly autonomous. Also, based on the use of student vignettes, Deuchar (2008) found that tensions could arise when the supervision did not meet the students' needs. He concluded that the best working relationship would emerge when a supervisor is flexible, responsive to the students' needs in a person-centred way, with open communication and a frank exchange of views. In addition, based on student interviews, Derounian (2011) found that a supervisor's responsiveness and receptiveness in providing feedback, and willingness to negotiate, was in the top three of most important characteristics of a research supervisor. We thus see that other studies have suggested the value of an adaptive approach to supervision, even though they use different terms such as responsiveness. However, it is important to note that these authors did not explicitly distinguish adapting to students' needs in terms of preferences or needs in relation to the goals, as we did in this study.

Limitations and future research

When interpreting the findings of the present study, it is important to bear several elements of the design of this study in mind. For instance, even though adaptivity seemed to be shared by these expert supervisors, our data did not allow for an analysis of whether the students of these supervisors learned more and completed master's theses of higher quality than students of other supervisors. We hope this will be taken up in future investigations concerning research supervision. In line with this, this study only addressed self-reported supervision strategies and considerations rather than actual supervisor behaviour. In future research it would be interesting to match such self-reports with observational data. Still, the student data did confirm the supervisors' self-reports to a high extent as the students identified the adaptive approach of the supervision. Also, supervisors who were locally recognised as skilful participated in this study. Therefore, it cannot be said that this adaptivity is only an attribute of good supervisors. For future research, it would be interesting to investigate whether adaptivity is indeed a supervision strategy that is shared by most good supervisors and to what extent novice supervisors, for instance, provide adaptive supervision.

In addition to these design-related issues it is also important to note that even though adaptivity is clearly presented in relation to 'the goals', it is not necessarily evident what these goals are as they can refer to both personal and/or curricular goals of the supervisors themselves or their perception of the students' goals (see also de Kleijn et al., 2013). Therefore, adaptivity in master's thesis supervision might be more complex than it first appeared. In line with this, the conflicting considerations indicate that providing adaptive supervision is not always easy and straightforward. Therefore, future studies could further explore the concept of adaptivity in research supervision by addressing what it is that supervisors do and do not adapt and specifically what other strategies they have for adapting, besides adjusting the level of regulation and strength of criticism.

Implications

Even though the findings of this study are exploratory in nature, they do suggest that adaptivity can be a way of describing the role of goals in supervision that is useful for students and universities as a whole. Therefore, it could be implied that it is important for supervisors to monitor different students' needs in light of the goals and adapt the supervision accordingly. For students, this implies the importance of providing their supervisor with the information that is needed to deliver adaptive supervision. This way, students can also contribute to an adaptive supervision process. Lastly, the conflicting considerations that were found indicate the complexity of providing adaptive supervision. Therefore, it is important that supervisors are supported in dealing with this complexity. This support could be supplied by means of, for example, workshops, training sessions, or peer review groups.

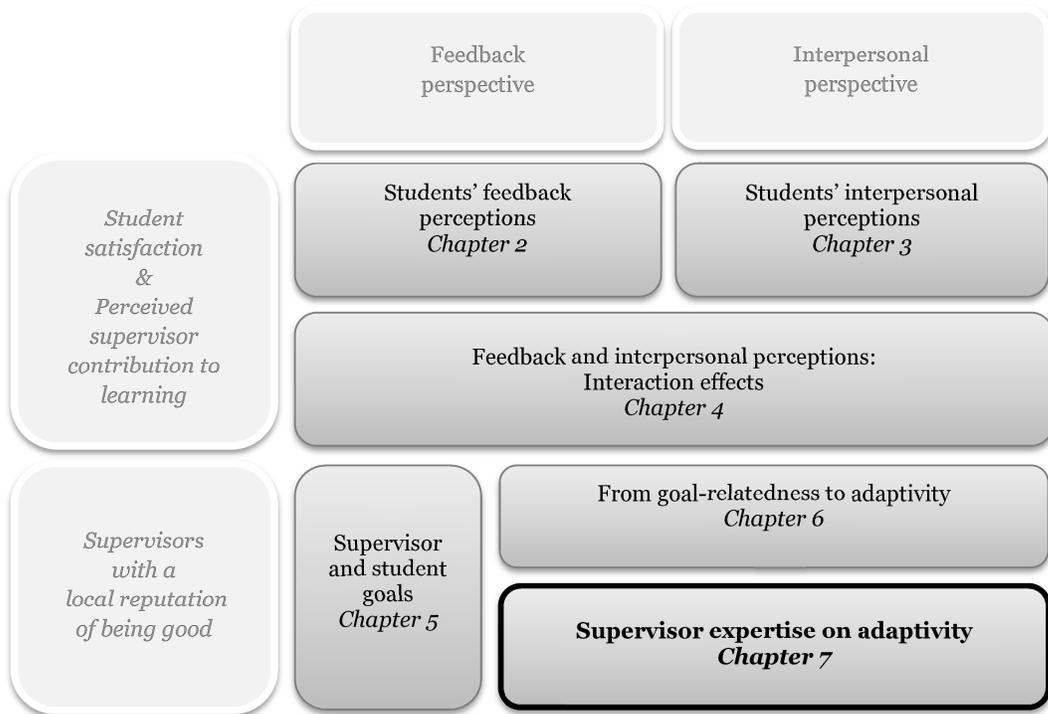
Appendix 1. Interview scheme for exploring the role of goals in master's thesis supervision

	Own/Self perspective	Other perspective
Goals of the master's thesis	1A. What is your goal for the master's thesis project? (C) Do you indicate this in the supervision meetings? If yes, how? Was that also the case in this supervision meeting?	1A'. What do you think is your student's/supervisor's goal for the master's thesis project? (C) How are you aware of that? Did you notice it in this specific meeting? If yes, how?
	2A. How is this master's thesis project going so far according to you?	2A'. How do you think this master's thesis project is going so far according to your student/supervisor?
	3B. To what extent has your goal for the master's thesis project been reached up until now?	3B'. To what extent do you think your student's/supervisor's goal has been reached up until now?
Goals of the supervision	4A. What is the goal of the supervision for you?	4A'. What do you think is your student's/supervisor's goal for the supervision?
	5B. To what extent has the goal of the supervision been reached up until now?	5B'. To what extent do you think your student's/supervisor's goal of the supervision has been reached up until this point?
Goals of the specific meeting	6A. What was your goal for this supervision meeting?	6A'. What do you think was the goal your student's/supervisor's goal for this supervision meeting?
	7B. Has that goal of this supervision meeting been reached? If yes: Could you tell me more about that? If no: Why do you think this is?	7B'. To what extent do you think your student's/supervisor's goal for this supervision meeting was reached? ...

Note. '...' indicates that the same follow up question was used as in the question above.

Quality of supervision

Perspectives on master's thesis supervision



Chapter 7

Supervisor expertise on adaptivity⁷

Several researchers have suggested the importance of being responsive to students' needs in research supervision. Adapting support strategies to students' needs in light of the goals of a task is referred to as adaptivity. In the present study, the practice of adaptivity is investigated by interviewing expert thesis supervisors about diagnosing student characteristics in order to determine students' needs and concurrent adaptive support strategies. The findings show that next to competence, supervisors also diagnose elements of students' determination and context. With respect to support strategies, it was found that supervisors adapt to student needs in terms of explicating standards, quality or consequences, division of responsibilities, providing more/less critical feedback and sympathising. The complexity of the relation between diagnosing student characteristics and adapting support strategies is illustrated and needs further study.

⁷ This chapter is submitted for publication in adapted form as: Kleijn, R.A.M. de, Meijer, P.C., Brekelmans, M., & Pilot, A. (*submitted*). Adaptive research supervision: exploring expert thesis supervisors' practical knowledge.

7.1 Introduction

In most higher education institutions in Europe a master's thesis is the final element of a master's programme (Meeus, van Looy, & Libotton, 2004). In most cases a master's thesis project can be characterised as having a substantial research component, the direction of which is determined by the learner, with prolonged engagement, and with the support of an individual supervisor (Todd, Bannister, & Clegg, 2004). The quality of the supervision process is deemed one of the most important factors contributing to a successful research project (e.g., Drennan & Clark, 2009; Heath, 2002; Seagram, Gould, & Pyke, 1998). Over the years, several scholars in the field of research supervision have suggested or concluded that an important aspect of effective supervision is that it is adjusted to an individual student's needs (Anderson, Day, & McLoughlin, 2006; Derounian, 2011; Deuchar, 2008; Gurr, 2001; Halse & Malfroy, 2010; Kam 1997; de Kleijn, Bronkhorst, Meijer, Brekelmans, & Pilot, *submitted*; Lee, 2008; Maxwell & Smith, 2011; McClure, 2005; Pearson & Brew, 2002; Todd, Smith, & Bannister, 2006; Wass et al., 2011).

From a *supervisor* perspective, Wass and colleagues (2011) found that supervisors needed different and more varying support strategies compared to a situation with a highly structured and pre-determined curriculum. Also, Anderson, Day and McLaughlin (2006), based on 13 interviews with master's thesis supervisors, suggested the idea of principled responsiveness with supervisors describing themselves 'as adjusting their approach to the needs of individual students' (p.166). They concluded that the supervisors participating in their study are responsive to the person and their circumstances. In line with this, Todd, Smith and Bannister (2006), based on eight interviews with social science supervisors, concluded that even though there are some general patterns in the supervision of research students (substantial support at the beginning and then moving away as the student feels more comfortable as an autonomous learner), the level and type of support differs from student to student and supervisors should be sensitive to these differences. In addition, Halse and Malfroy (2010) interviewed supervisors (N=26), and following the work of Aristotle, they framed doctoral supervision as professional work with five facets, one of which was habits of mind; 'being interested in students and their work; responsive to students' needs; able to make balanced judgements about the quality of students' work; able to provide critical yet constructive feedback and advice; and able to learn from these experiences and apply this learning in different situations with different students' (p.85).

From a *student* perspective, McClure (2005) investigated a group of Chinese laboratory-based research students in an overseas environment during the first 6 to 18 months of their candidature, and concluded that even within such a homogeneous group, these students required different supervisory relationships with their supervisor, ranging from highly dependent to highly autonomous. Also, Deuchar's (2008) study, based on the use of student vignettes, found that tensions could arise when the supervision did not meet the students' needs, for instance, when supervisors offered pastoral support and the student was looking for support with project management. He concluded that the best working relationship emerges when a supervisor is flexible, responsive to the student's needs in a person-centred way, with open communication and a frank exchange of views. Students themselves seem to be aware of the value of this practice; Derounian (2011) found that a responsive supervisor,

who is receptive in providing feedback, and willing to negotiate, were the top three most important characteristics of a research supervisor in the eyes of 14 students.

Thus, the idea that research supervision should be responsive to the students' needs seems to be widely acknowledged. Related to this, in an earlier study we found that good supervisors shared the practice of adapting to students' needs (de Kleijn, Bronkhorst, Meijer, Brekelmans and Pilot, *submitted*). Interestingly, these supervisors did not just adapt to the general wishes of the students, but to their needs *in light of reaching the goal(s) of a certain task* such as a master's thesis project. We named this shared practice '*adaptivity*'. Next to the fact that most supervisors indicated that they adapted their supervision strategies to different students' needs in terms of reaching the goals, they also experienced tensions with regard to providing critical comments without diminishing motivation and regulating students who might not be able to finish successfully their master's thesis project as independently as would be intended. The present study aims to provide more insight into the practice of adaptivity in research supervision and to support supervisors in providing adaptive supervision (Pearson & Brew, 2002), by addressing *how* supervisors can actually adapt their supervision to the specific needs of specific students in light of the goals of a task. This study explores the practical knowledge of expert thesis supervisors concerning adaptivity. We first conceptualise the concepts of practical knowledge and adaptivity.

Conceptualising supervisors' practical knowledge

Following Verloop, van Driel and Meijer (2001), we use the term 'practical knowledge' to indicate 'an overarching, inclusive concept, summarising a large variety of cognitions, from conscious and well-balanced opinions to unconscious and unreflected intuitions' (p.446). Teachers' practical knowledge is often distinguished from formal propositional knowledge that is mainly learned in teacher education institutes. As the focus is on the practice of providing adaptive supervision, we use the lens of supervisors' own practical knowledge rather than formal propositional knowledge. The term 'practical' also emphasises the practical nature of the knowledge that is mainly acquired from the activity of supervising students. As argued by Verloop et al. (2001), even though teachers' practical knowledge is strongly related to someone's individual experiences and context, there are elements that are shared by all or large groups of teachers. It is suggested that in order to do justice to the complex and specific nature of practical knowledge, it is important to explore both these shared and individual elements. Therefore, in the present study we aim to explore supervisors' practical knowledge with respect to adaptive research supervision and the extent to which these elements are shared.

Conceptualising adaptivity

Building on the findings of de Kleijn et al. (*submitted*), we conceptualise adaptivity as *adapting support strategies to students' needs in order for them to reach the goals*. This conceptualisation contains three variables that need further elaboration: supervision strategies, students' needs and goals. In the context of research supervision, the term *goals* refers to curricular goals and/or personal goals of the supervisor and/or the student (de Kleijn, Meijer, Brekelmans, & Pilot, 2013). In addition, in a literature review concerning scaffolding, van de Pol, Volman and Beishuizen (2010) found that adapting support to individual students can aim to support students' metacognitive activities,

cognitive activities, or affect. The variables *adaptive support strategies* and *students' needs* are based on Wood's (1991) notion of contingency, which comprises the elements of diagnosing students' understanding and adapting support to that understanding. Hence, adaptivity requires two supervisor activities: diagnosing needs and intervening with adaptive support strategies (see also van de Pol, Volman, & Beishuizen, 2011). In this study we focus on these two activities, and based on the above, we address the following research question: *What is the practical knowledge of expert thesis supervisors concerning providing adaptive supervision?*

7.2 Methods

Design

Two group interviews or group discussion meetings (GDM) were organised and individual interviews were held with five expert thesis supervisors. Between the two GDMS the supervisors filled out a short log file about a supervision meeting with a student. Interviews were chosen as this is a common means of measuring teachers' practical knowledge and beliefs (Meijer, Verloop, & Beijaard, 2002). In addition, we included expert supervisors as an earlier study indicated that they shared the practice of providing adaptive supervision (de Kleijn et al., *submitted*). Following Bogner and Menz (2009), we defined experts as having 'technical, process and interpretative knowledge that refers to a specific field of action, by virtue of the fact that the expert acts in a relevant way' (p.54). In other words, expert knowledge incorporates among other things both 'systematised and reflexively accessible knowledge as well as a range of disparate maxims for action and individual rules of decision, which has the power to produce practical effects' (p.54–55; Bogner & Menz, 2009). In addition, the first two interviews were in a group, because we were also interested in shared practical knowledge (Verloop, van Driel, & Meijer, 2001), and more than one interview was held in order to integrate the findings from the interviews and the log files by using both as input for subsequent interviews. Following Meuser and Nagel (2009), the data were collected using open discussions and interviews based on general topics. The GDMs and interviews focused more on adaptivity on a general level and the log file aimed to provide data about specific students and instances, as de Kleijn et al. (*submitted*) found that supervisors can provide both more general and specific information about adaptivity.

Participants

As we sought to include expert supervisors who produced practical effects (Bogner & Menz, 2009), we asked the deans of three faculties to indicate some of the best supervisors of their faculties and, in addition, we included supervisors who were nominated for the 'best teacher of the year' award by their students in the past five years. These supervisors were invited to take part in the study, of which five supervisors agreed to participate. The supervisors came from four different departments: Humanities, Economics, Pharmacy and Social Sciences. Two supervisors were female and three were male. Two supervisors were teaching staff, two were assistant professors and one was an associate professor.

Procedure

During the first GDM the expert thesis supervisors and the researcher got acquainted and it was discussed what they saw as the main goals for master's thesis projects and how they supervise students to reach these goals. During the GDM, it appeared that all five supervisors applied adaptivity in their supervision. The *outcome* of this GDM was that it became clear that adaptive supervision was a shared practice among these supervisors. Building on this first GDM, in order to explore two activities of adaptivity, diagnosing student needs and providing adaptive support strategies, the supervisors were asked to fill out the log file based on a supervision meeting with a student. Four supervisors completed the log file.

During the second GDM the researcher's summary of the first GDM was discussed and the supervisors spoke about differences between students by describing different student types. They focused mainly on problematic student types. The *outcome* of this second GDM was data concerning the diagnosis of student needs: a list of student types with corresponding descriptions in terms of student characteristics.

Consequently, a list of the student types and accompanying student characteristics discussed in GDM 2 was used as input for the individual interviews for two reasons: (a) as a member check so that they could indicate whether their views were correctly reflected (Krefting, 1991) and (b) as a means to refresh their memory and to invite them to further elaborate on these student types. In the interviews some successful student types were also added. The *outcome* of the interviews was an extended overview of student types and corresponding student characteristics, as well as adaptive support strategies.

Instruments

The topics discussed during the first GDM were goals of the master's thesis and providing feedback (Table 7.1). During the second GDM, to elicit student characteristics that supervisors adapt to, the guiding question was: what types of students do you supervise? For subsequent individual interviews, an interview scheme was developed in which the student types and descriptions were further elaborated on (Table 7.1). The log file was initially designed by the researcher, but adjusted in consultation with the supervisors during the GDM to make sure that the questions fitted the supervisors' practice. The student types mentioned were used to elicit student characteristics and types of adaptive support strategies. Some examples of student types mentioned by the supervisors are the Helper, the Nobel prize winner, the Unguided missile, the Story teller, the Compliant student and the Ideal student.

Analysis

First, fragments concerning student characteristics or adaptive support strategies were selected from the GDM and interview transcripts. As the data concerning student characteristics and adaptive support strategies were collected in relation to the student types that had emerged, these data fragments were then organised in a table with the rows representing the student types that were mentioned by the supervisors in GDM 2 and the individual interviews, and the columns representing student characteristics and adaptive support strategies. Second, from the student characteristics

Table 7.1

*Overview of instruments**Topic list GDM 1*

Introduction and getting to know each other

What are the goals of a thesis project?

How do you provide supervision in order to reach these goals?

Log file

Based on what student signs did you decide on what strategy to use in the supervision meeting?

To what extent are you satisfied with your role in the supervision meeting?

About what specific aspects of the meeting are you satisfied and/or dissatisfied?

Topic list GDM 2

Introduction and summary of GDM 1

What different kinds of students do you supervise?

Interview scheme individual interviews

Which of these student types do you come across and what kind of students are they?

What student types do you come across that are not yet described in this overview?

What is a typical example of feedback you provide to these different student types?

column, the researcher selected the phrases that described one characteristic of a student type and these were put in a separate document thereby disconnecting them from the student types and according support strategies ($N=116$). For the adaptive support strategies column the same procedure was applied ($N=68$). Third, to develop a theory about what student characteristics supervisors adapt to, a grounded theory approach was used when analysing these two lists (Glaser & Strauss, 1967). A grounded theory approach generally concerns three steps: open coding, axial coding and selective coding (e.g., Corbin & Strauss, 1990). During open coding data fragments are conceptually coded, during axial coding the relation between codes is explored and during selective coding the main overarching theme is established (Corbin & Strauss, 1990). The main theme was already established in the GDMs together with the supervisors (i.e., adaptivity in terms of student characteristics and adaptive support strategies). With respect to the open coding, a code was only maintained when at least two supervisors had mentioned it. During the axial coding the codes of the open coding were grouped in several main categories. This step was also performed by a second and independent educational researcher (also experienced as a thesis supervisor) and differences in their findings with respect to the main categories were discussed until agreement was reached. Fourth, in order to investigate the relation between diagnosis of student characteristics and adaptive support strategies, for each student type the accompanying categories of student characteristics and adaptive support strategies were indicated. Therefore, the initial relation between diagnosis and intervention was re-established. The analyses were performed by the first author. For the data collection, data analyses and conclusions an audit procedure was successfully completed (Akkerman, Admiraal, Brekelmans, & Oost, 2008), indicating that a third and independent researcher reviewed all steps taken, decisions and interpretations, so to establish visible, comprehensible and acceptable results and conclusions.

7.3 Results

Diagnosis of student characteristics

Based on 116 student characteristics distilled from the data and the open codes given to the fragments, three main categories were developed together with an independent researcher (Table 7.2). Three fragments could not be labelled as the fragments were too general (e.g., ‘Someone who doesn’t reflect anything’) and seven labels occurred only once. The three main categories were Competence, Determination and Context. The category Competence included general competence, writing competence, abstract and critical thinking and the student’s perception of his/her own competence. The category Determination comprised of enthusiasm about a topic, motivation, ownership and self-regulation, dealing with deadlines, attitude towards supervisor, effort and commitment and focus and consistency. Lastly, the category Context included orientation to profession, social environment and distraction from personal situation. For Competence and Determination the characteristics could be identified as positive or negative, which is indicated with (+) and (–) in Table 7.2.

Adaptive support strategies

With respect to the 68 forms of adaptive support strategies that supervisors described in relation to the different student types, four main categories were developed together with the independent researcher (Table 7.3). Six codes appeared only once, and were therefore not included. The four main categories were Explicating standards, quality or consequences, Division of responsibilities, Providing more/less critical feedback and Sympathising with the student. Explicating standards or consequences included giving an indication of the grade or quality of student work, emphasising the standards and criteria, explicating supervisor satisfaction or dissatisfaction, indicating consequences of certain student behaviour, or explicating why the supervisor chooses a certain supervision strategy. Division of responsibilities included the supervisor assuming a more/less proactive attitude towards the student, the supervisor taking over issues related to planning and deadlines, providing a structuring assignment to the student, giving the student the suggestion to quit or postpone the master’s thesis project, or the supervisor transferring the responsibility to the student. Providing more/less critical feedback concerned strategies in which supervisors choose to be more or less critical towards the student. Lastly, sympathising with the student includes, for instance, listening to students’ personal problems and suggesting where they can turn to for help concerning non thesis-related issues.

Table 7.2

Main categories for diagnosed student characteristics and example fragments

Student characteristic	Example fragments
Competence level	(+) 'That student, she was very good, she just wrote very good pieces.' (<i>Supervisor O, individual interview</i>)
	(-) 'Not being able to distinguish opinions from facts, for instance very politically engaged. They have opinions by selectively perceiving and only hearing that which matches their ideas. Not a critical mind.' (<i>Supervisor H, individual interview</i>)
	(-) 'But they just don't see where something should be going. It sounds a bit awful but some people just don't have it.' (<i>Supervisor K, individual interview</i>)
Determination	(-) 'Ehm, or well they sometimes do not stick to their agreements, or postpone them again.' (<i>Supervisor T, individual interview</i>)
	(+) 'Being able to work, think and act independently. It is not about assertiveness I think, but taking responsibility for your own thesis.' (<i>Supervisor E, individual interview</i>)
	(-) 'Who go from here to everywhere. I recognise that as well. At one point they say: I will do this. And then the next time they say: I will do that. They keep going in different directions rather than one consistent direction, so to speak.' (<i>Supervisor H, individual interview</i>)
	(-) 'Often boys who seem to reach puberty very late and then, well just don't accept me as an authority and make a fuss.' (<i>Supervisor K, GDM2</i>)
Context	'A concrete orientation to the field only, not the reflection, or rethinking of what we know and do not know.' (<i>Supervisor H, individual interview</i>)
	'Some others would love to work at a ministry and find it more important to write policy documents and almost find that as more important than a thesis that is publishable.' (<i>Supervisor K, individual interview</i>)
	'They won't do something scientific or immunology-related, but they go straight to McKinsey, or to a friend of their father.' (<i>Supervisor T, GDM2</i>)

Table 7.3

Main categories of adaptive support strategies and example fragments

Adaptive support strategy	Example fragment
Explicating standards, quality or consequences	<p>‘And then you come to a point where you say: this bears down to a four [an F]. So, if you want to pass this, and it would be wise to try and do so, you will have to do something with my commentaries.’ (<i>Supervisor H, individual interview</i>)</p> <p>‘Well, I put into words: I have the idea that I say things that somehow (points at forehead) don’t end up here. Is that correct? Am I completely off? Is my communication wrong? Is it my style of personality, or... I just don’t see that you understand it, do you think you do?’ (<i>Supervisor H, individual interview</i>)</p> <p>‘And then made it very explicit in the supervision: listen up, I try to get you as far as possible so we’ll go to the last. And that means that you face this. And someone else, for whom the standards is less high, that person would not experience this’ (<i>Supervisor O, individual interview</i>)</p>
Division of responsibilities	<p>‘So whereas for some students I email them with: hey I haven’t heard from you in a while, how are you? For such a student I think, well ok you come and just show me some work.’ (<i>Supervisor T, individual interview</i>)</p> <p>‘That means that they would have to start producing texts: I want to see your first chapter next week, your second chapter in two weeks. Then I focus on time management a lot.’ (<i>Supervisor E, individual interview</i>)</p> <p>‘And no, then I work harder myself too. Then, I don’t just look at what you have written, but I also see it bigger in terms of what can you add and what can you do extra. Did you think of that or have you tried this?’ (<i>Supervisor T, individual interview</i>)</p>
Providing more/less critical feedback	<p>‘Also, in terms of content, because in that case I won’t put the standard too high for them. How bad that might be. Then, we just go for a six [a C], then we don’t go for fantastic scientific research, but just make sure that it is satisfactory. That leads to a different way of providing feedback.’ (<i>Supervisor K, individual interview</i>)</p> <p>‘Students that say, I aim for a nine (an A+), then you get hell. And if they manage to handle that... So try to stimulate their ability resolve issues themselves and their self-analysing ability.’ (<i>Supervisor H, individual interview</i>)</p> <p>‘And then I am very hard. Then I say: just go home and come back when you have something that is (1) feasible, (2) what you can do and (3) that is related to something that gives you a basis and not this kind of stupidity. Because you just do not know what you are talking about. Being critical at something that you don’t know is very easy, but here you are seen through. So he got hell. Such a boy, I put him back on the ground with both feet.’ (<i>Supervisor H, individual interview</i>)</p>
Sympathising with student	<p>‘So, eh well, becoming a bit personal like: I understand that your mother is very ill and that that costs a lot of time and that you can’t always concentrate on your thesis.’ (<i>Supervisor E, individual interview</i>)</p> <p>‘By showing one’s hand in terms of your own research experiences, like guys the first time that I write a paper that is just perfect in once, still has to be born. It is very hard and I myself run into these kinds of problems. That way, your students when they themselves haven’t reached their result with their determination you show them like, take this from me, if you do this now it will pay off.’ (<i>Supervisor O, individual interview</i>)</p>

Relation between diagnosed student characteristics and adaptive support strategies

After the individual analysis of diagnosis characteristics and adaptive support strategies, these two categories were re-integrated to examine possible relationships. It was found that this relation is not just straightforward, that a single characteristic can be linked to a single support strategy, as a fragment from the first GDM also illustrates:

Supervisor O: ‘Because, based on that, that mix of interventions, that is that sign with an exclamation mark behind it, if there is seven [strategies], there are 7x6x5x4x3x2 combinations of interventions and that’s what we do in practice. So you always mix a critical remark with a directive remark.’

Supervisor T: ‘And that can differ per meeting, I think.’

Supervisor O: ‘And then you have to double it because for some strategies you deliberately do not use them. So because, just like weak students, this student needs that you explain how you can make proper footnotes, but there’s so much more to it, we’ll see that later.’

Supervisor K: ‘Then your intervention is doing nothing.’

This fragment suggests a rather complex relation between sets of diagnosed student characteristics and sets of adaptive support strategies. In order to explain this finding in more detail, Table 7.4 presents five examples of student types in terms of their characteristics and the accompanying adaptive support strategies. We deliberately chose student types showing that overlapping student characteristics can have different forms of adaptive support strategies and that a certain type of adaptive support can relate to different sets of student characteristics. As can be seen in Table 7.4, for the Ideal student, the Do-gooder, the Musty student and the Wrongly selected student the support strategy ‘providing more critical feedback’ is mentioned by one or more supervisors, whereas for the C-student providing less critical feedback is mentioned. This strategy is not exclusively related to any of the characteristics, as some have high or low determination, or high or low competence. We thus found that different sets of diagnosed characteristics can lead to supervisors providing more or less critical feedback in combination with one or more other support strategies. This is also evident in the following fragment of the individual interview with Supervisor K:

‘The undisciplined mind. Eh that is more or less like the do-gooder. The fact that you believe something or think it is true, doesn’t mean that it is true. So you have to go to those arguments and to work towards depth. And the fact that you go to university is not enough. You have to work for it. You have to go for it and get inspired. And if that doesn’t happen it doesn’t work. But what might be the difference is that the undisciplined mind, in my opinion, is also lazy. So finds a six (C-) enough. While the other is not lazy, the do-gooder, who wants to make things work. So you stimulate them in another way. Because if someone is also lazy, you just sometimes have to use your whip, be clear about boundaries like: now you start working. While the do-gooder, well you have to canalise them, and make sure he ends up in the right place, rather than having too little motivation.’

Supervisor K indicates that for her having strong beliefs without arguments for them, in combination with high or low motivation, leads to different forms of adaptive support strategies.

It seems, therefore, that there are no one-to-one relations between diagnosis of characteristics and supervision strategies. In other words, adaptivity support cannot be described by simple ‘equations’.

Table 7.4

Examples of student types with student characteristics and adaptive support strategies

Example student type	Diagnosed student characteristics	Adaptive support strategies
The ideal student	<i>Competence</i> : general competence (+) <i>Determination</i> : motivation (+), commitment (+), self-regulation (+), dealing with deadlines (+), dealing with supervisor (+)	Assuming a more proactive attitude Providing more critical feedback
The do-gooder	<i>Determination</i> : motivation (+), enthusiasm about content (+) <i>Context</i> : orientation to practise	Providing more critical feedback Explicating quality
The wrongly selected student	<i>Competence</i> : general competence (-), abstract thinking (-) <i>Determination</i> : commitment (+), self-regulation (-) <i>Context</i> : distraction from personal life (+)	Providing more critical feedback Division of responsibilities
The musty	<i>Competence</i> : general competence (-) <i>Determination</i> : motivation (-)	Providing more critical feedback Explicating quality Explicating standards
The C-student	<i>Determination</i> : motivation (-)	Providing less critical feedback Explication quality

Note. (+) and (-) indicate whether the diagnosis of these characteristics is high (+) or low (-).

7.4 Discussion

The present study aimed to explore expert thesis supervisors' practical knowledge about providing adaptive supervision. Based on the work of van de Pol, Volman and Beishuizen (2010), we focused on diagnosing student characteristics and providing adaptive support. We made a first attempt to map the student characteristics supervisors diagnose and the support strategies they consequently use to adapt their supervision to these diagnosed characteristics in order to reach the goals of a master's thesis project. Several authors have argued that there is probably no favourite supervision strategy that is advocated over the others, as different students might need different styles or strategies (e.g., Hemer, 2012).

Our findings with respect to *diagnosing* provide more insight into this issue by giving a first exploration of what student characteristics seem to matter when diagnosing differences between students' needs. We found that supervisors diagnose several elements of students' competence, their determination and their context. Related to this, in a discussion about the increased diversity in the university classroom, Buckridge and Guest (2007) mention several differences between the hypothetical students academic Susan and non-academic Robert based on the paper of John Biggs (2003): attitude and approaches to learning, motivation, consciousness and engagement. These characteristics would all fall into our determination category. Our findings thus add student competence and context to the discussion about differences between higher education students that matter for designing learning environments.

In relation to the *adaptive support strategies*, other authors mainly indicated that in general some students might need more guidance than others (e.g., McClure, 2005). Our findings further elaborate on this issue by giving a more specific overview of support strategies that supervisors employ, based on the diagnosis of different student characteristics. The category division of responsibilities is probably closest to the already mentioned more or less guidance. Also, being more explicit to students about standards, the quality of their work or the consequences of their behaviour, providing more or less critical feedback and sympathising with them, were found to be strategies adapted to different diagnoses of students' characteristics and needs.

Concerning the *relation* between diagnosis of student characteristics and adapting support, the findings suggest that this is a rather complex set of interactions between different diagnoses and support strategies. This might just be *the essence* of adaptivity and the reason why it is not as straightforward as it might appear at first glance. Furthermore, in line with this hypothesis, Overall et al. (2011) found that students' research self-efficacy could be explained by a combination of high levels of autonomy support and personal support. This would confirm that the effect of a certain support strategy is best judged in relation to the other support strategies. As such, it is concluded that even though diagnosis of student characteristics and adaptive support strategies can be described with several main categories, the relation between both elements of supervisors' practical knowledge is more complex.

Limitations and directions for future research

Despite the contribution of our findings to understanding the practice of adaptive supervision in master's thesis projects, it is important to note that the categories for diagnosis of student characteristics and adaptive support strategies should be interpreted as a first attempt to map them, rather than as complete and exhaustive overviews. For instance, the supervisors seemed to emphasise more problematic student types than successful and average student types. Therefore, our findings might not be representative for all students. In addition, these findings concern differences between students and not differences between different meetings with one student. For this reason, we want to note that in this study we focused on the *what* of diagnosing, rather than the *how*. Future research might take up these issues and elaborate on these findings by further developing the categories, differences between supervisors, the *how* of diagnosing adaptivity and distinguishing adapting to differences between students from adapting to an individual student from meeting to meeting. Another limitation is that the design of this study does not allow us to address the extent to which diagnosing and providing adaptive support strategies are conscious, or whether their articulation was due to the research design.

As regards the participants in this study, they were included because of their local reputation as good supervisors. It would be interesting to contrast these findings with data from supervisors who have just started to supervise students or have low self-efficacy with respect to research supervision. This would measure the extent to which adaptivity is something that distinguishes good supervisors from other groups of supervisors.

Lastly, future research might also address the role of students in the practice of adaptive supervision. After all, adaptivity would require the student to share some of his/her characteristics, hence providing the supervisor with the opportunity to adapt to specific situations and needs. It would be interesting to investigate to what extent students are willing to do this, and how they could be supported in sharing useful information about their situation.

Implications

In line with the findings of de Kleijn, Bronkhorst, Meijer, Brekelmans and Pilot (*submitted*), these findings suggest that adaptivity is a way of increasing the goal-relatedness of supervision and therefore the effectiveness of supervision. After all, it is not farfetched to think that adapting the supervision strategies to a specific student's situation and needs might lead to a more constructive supervision process in which he or she uses the provided advice and feedback. However, adaptive supervision still has to be empirically related to increasing student learning and performance. Still, at this point, we deem the research findings convincing enough to say that it would be worthwhile for supervisors to know what adaptivity looks like in terms of providing adaptive support and diagnosing what students might need to reach the goals of the master's thesis project.

This study has also two methodological implications. First, the open way of data collection and intermediate data analysis allowed new insights to arise and develop in the interviews with the expert thesis supervisors. Moreover, Bronkhorst, Meijer, Koster, Akkerman and Vermunt (*in press*) suggested that collaboration with educators can trigger enthusiasm, involvement and participation, which, in turn, can benefit the truth value, neutrality and, to some extent, the applicability of the research. Therefore, when interviewing experts in the study of practical knowledge, it is advisable to apply an open way of data collection and to give the experts a say in what topics are worth exploring in depth. This is in line with the argument of Bogner and Menz (2009). Second, we found that keeping small log files increases supervisors' consciousness concerning their own supervision practices, as is illustrated by supervisors' comments in GDM 2:

Supervisor O: 'The result of last week is that, this is the work of the student about whom I filled out the log file and this afternoon we have another meeting. And I just nicely wrote up front what I want to do with this meeting. [...] And I think that is already something that takes little time for supervisors and can lead to better supervision results.'

Supervisor K: 'But also because you know: I have to fill out the form, so I'm not just gonna mess around. But I will closely observe myself in terms of what am I doing? So my behaviour changes due to the fact that I'm involved in your study.'

Therefore, we suggest that keeping short log files such as the one used in this study, and discussing them could be an effective way of supporting a supervisor.

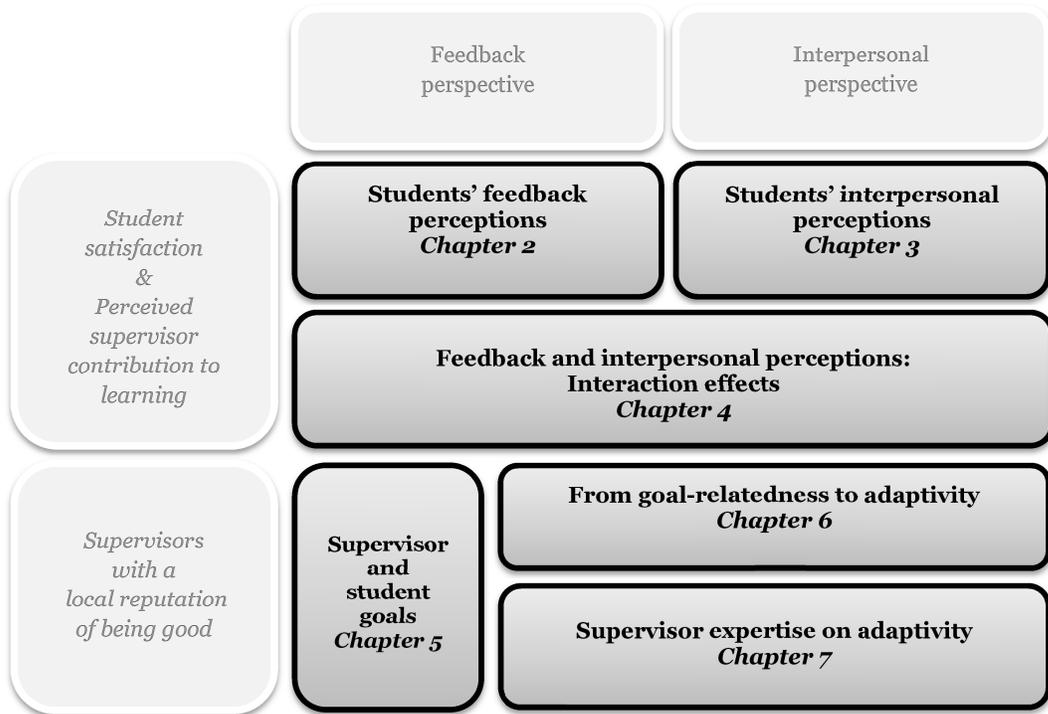
Conclusion

In sum, the findings of this study give insight into how expert supervisors provide adaptive supervision. We conclude that these supervisors carefully observe students in terms of competence, determination and context and, based on the diagnosis of these characteristics, decide on what supervision strategy would benefit the students most, such as division of responsibilities, being more

explicit to students about standards, quality and consequences, providing more or less critical feedback and sympathising with their situation. Still, this is only a first attempt to explore adaptivity and, therefore, we suggest that this issue is considered in future research studies concerning research supervision.

Quality of supervision

Perspectives on master's thesis supervision



Chapter 8

Conclusion and Discussion

In this chapter the conclusions of the individual studies are summarised and an integrated conclusion with respect to the main research question is provided. Then, the contributions of this dissertation to feedback theory, interpersonal theory, adaptivity theory, and to conceptualising the quality of research supervision are described. In addition, both conceptual and methodological limitations of the studies are discussed, as well as conceptual and methodological suggestions for further research. Lastly, the practical implications of the findings for supervisors, institutions and students are presented.

8.1 Conclusion

The overall research question of this dissertation was:

How can quality in master's thesis supervision be understood from a feedback perspective and an interpersonal perspective?

Each individual chapter presenting an empirical study, contributed to an answer to the research question. A summary of the conclusions of these studies is described below. Then, these conclusions are integrated and the research question is answered.

Summary of conclusions from individual studies

In **Chapter 2** student perceptions were investigated from a feedback perspective, addressing the research question: *How do students perceive supervisor feedback in terms of focus, goal-relatedness, and elaboration and how are feedback perceptions related to student satisfaction and perceived supervisor contribution to learning?* Structural equation modelling techniques were applied to questionnaire data from 1016 students in three faculties at Utrecht University. The results of the study indicate that students perceive the focus of feedback in terms of a focus on task and self-regulation; they perceive the goal-relatedness of feedback in terms of feed up (goal-setting) and feed back-forward (how am I going and where to next?); elaboration of feedback is perceived in terms of positive and negative feedback. Furthermore, students who perceive feedback to be positive and to provide information on how they are going and what next steps to take are most satisfied with their supervision and perceive they are learning most from their supervisor.

In **Chapter 3** student perceptions were investigated from a supervisor–student relationship perspective, addressing the research question: *How do students perceive supervisor control and affiliation and how are these perceptions related to student satisfaction and perceived supervisor contribution to learning?* Again structural equation modelling techniques were applied to questionnaire data from 401 students in three faculties at Utrecht University. The findings revealed that affiliation was a strong predictor of student satisfaction, perceived supervisor contribution to learning and final grade. For control, a linear relation was found for perceived supervisor contribution to learning and a quadratic effect for student satisfaction was found, indicating that too much control would reduce satisfaction.

The results of Chapters 2 and 3 indicate the importance of student perceptions of both feedback and the interpersonal supervisor–student relationship. However, from these findings it remained unclear how the two perspectives related to each other. That is why in **Chapter 4** student perceptions of master's thesis supervision were again investigated, addressing the following research question: *How are student perceptions of feedback and of the supervisor–student relationship related to student satisfaction and perceived supervisor contribution to learning in the context of master's thesis supervision?* Questionnaire data (N=1016) were analysed using regression analyses. It was found that in relation to student satisfaction and students' perceived supervisor contribution to learning, affiliation was by far the most important predictor, followed by control for student satisfaction and feed back-forward for perceived supervisor contribution to learning. Also, interaction effects between feedback and interpersonal perceptions were found, indicating that the role of

feedback perception is most important in situations in which no optimal supervisor–student relationship could be established.

In Chapter 2 it was found that students perceived their supervisors' feedback to be only slightly goal-related. Therefore, in **Chapter 5** both student and supervisor goals in master's thesis projects were investigated in greater depth. The three research questions were: (1) *What goals do students and supervisors in a supervision dyad have for a master's thesis project?* (2) *What are similarities and differences between supervisor and student goals within and between dyads?* (3) *How do supervisor's goals relate to the student's perceptions of supervisor goals and how do student's goals relate to the supervisor's perceptions of student goals?* Interviews with supervisors, each of whom had a local reputation as a 'good' supervisor, and one of their students were analysed by means of the Dublin descriptors (2003) and the Ford and Nichols taxonomy of human goals (1991, 2001). The results indicate that most students and supervisors pursue both curricular and personal goals, which is explained in terms of the transitional phase from being a student to becoming a professional. Within dyads, the goals of supervisors and students vary greatly and supervisors recognise students' curricular goals to a greater extent than students' personal goals.

As it became clearer what goals supervisors and students pursued, the question arose as to how supervisors provide goal-related supervision. Therefore in **Chapter 6** the following research question was addressed: *How do expert master's thesis supervisors provide goal-related master's thesis supervision and how is this perceived by their students?* Twelve supervisor–student dyads were individually interviewed and a recurrent theme in the interviews was the adaptive nature of supervision. Adaptivity is described as a way of aiming at achieving goals (up-component) by adapting the support strategies (forward-component) to a specific student's needs (back-component). Even though several students recognise this process in their supervisor's supervision, for supervisors, providing adaptive supervision can bring tensions with respect to the degree of supervisor regulation and how critical the comments given to a student are. The findings imply adaptivity that enhances goal-related supervision in master's thesis projects.

As Chapter 6 indicated that adaptivity is a way of supporting goal-related supervision, in **Chapter 7** the process of providing adaptive supervision was investigated in terms of diagnosing student characteristics and accompanying adapted support strategies. Therefore, five expert thesis supervisors were interviewed in a group and individually and they also completed log files concerning meetings with their students. The findings show that supervisors diagnose students' competence, determination and context in order to adapt their support strategies. These adapted support strategies range from explicating standards, quality or consequences to division of responsibilities, providing more/less critical feedback, and sympathising. The relation between diagnosing and adapting support seems to be complex as no one-on-one relation was found between student characteristics and adapted support strategies.

Integrated conclusion

In exploring the quality of supervision from a student point of view (student satisfaction, student perceptions of the contribution of the supervisor to their learning and student goals), from the findings of this dissertation the following conclusions can be drawn with respect to understanding the quality of master's thesis supervision:

- The quality of the supervision can be explained in terms of the extent to which the student perceives the feedback of the supervisor as being more or less goal-related, focused on the task and positively elaborated. This means that in the eyes of the student, the feedback provides more or less information about what the goals are (feed up), how his/her performance relates to these goals (feed back), and what (s)he can do in order to come closer to reaching the goals (feed forward). Also, the quality of the supervision is related to the extent to which the feedback, in the eyes of the students, provides information about their writing products and process, relates to what is not good enough and why, and articulates what a student has done well and specifically why this is good.
- The quality of the supervision can also be related to the extent to which the student perceives the supervisor as being more or less affiliated or warm, and more or less controlling or guiding. This is the extent to which the supervisor, in the eyes of the student, acts in a friendly, helping, and steering way.
- In situations in which creating a warm relationship with the student seems to be problematic, student perceptions of feedback are even more important for understanding differences in the quality of the supervision.
- The quality of the supervision can also be understood in terms of the extent to which it supports students to reach their goals. Besides learning about the topic of study, students also aim for personal goals such as getting their diploma, providing new insights and practical tools, enjoying the process, and proving to themselves that they can do it.

Approaching the quality of supervision from the point of view of supervisors with a local reputation as good supervisors, in terms of their self-reported practice and goals, additional conclusions with respect to understanding the quality of supervision are as follows:

- The quality of the supervision can also be understood in terms of the extent to which it supports the supervisor goals to be reached. In addition to students applying the knowledge and understanding that they have gained in developing their master's thesis project, another goal of several supervisors is that students are able to work with a degree of self-determination.
- The goal-relatedness of the supervision is established by means of supervisor adaptivity. This means that with the main goals being the same for all students, supervisors adapt their supervision strategies to the needs of a specific student in a specific situation in order for this student to reach the curricular and/or personal goals. Therefore, supervisors diagnose several student characteristics in terms of students' competence, determination and context. Consequently, supervisors adapt their supervision strategies to these diagnoses in terms of explicating standards, quality or consequences, division of responsibilities, providing more/less critical feedback, and sympathising. However, providing adaptive supervision might not be entirely straightforward as

the relation between diagnoses and adaptive support strategies appears to be rather complex and providing adaptive supervision can give rise to several dilemmas for supervisors.

- Relating the findings on adaptivity to the findings from the student questionnaires, it is hypothesised that in order to establish favourable student perceptions, different students need different types of supervision strategies.

8.2 Contributions and Discussion

In this section the main contributions of the dissertation to the domain of master's thesis supervision are discussed in terms of adaptivity, combining feedback and interpersonal perspectives, and conceptualising quality. In addition, more general contributions to the field of feedback and interpersonal relationships in education are discussed.

Master's thesis supervision: adaptivity

First, the findings of **Chapters 6** and **7** show that adaptivity can support our understanding of the goal-relatedness of master's thesis supervision. Although comparable concepts have been coined in contexts on classroom situations in both higher and secondary education, the context of a master's thesis project does provide several specific opportunities for adaptivity to occur. In the introduction chapter, four characteristics of master's thesis projects were described and these can be related to providing opportunities for adaptivity. First, the *duration* of a master's thesis project is longer than general courses in higher education. This prolonged engagement provides the supervisor with the opportunity to really get to know the student, including where the student stands, what the student needs in order to reach the goals of a master's thesis project, how the student learns and for instance how motivated the student is. This information can then be used to determine the student's needs and form a basis for providing adaptive supervision. Besides this longer duration, also the fact that the *interaction* between the supervisor and the student is one-on-one, provides the supervisor with the opportunity to get to know the student individually and to learn what the student needs. Also, that the students decide on the *focus* and topic of the thesis themselves affords the supervisor certain first insights about them. For instance, does a student pick a challenging and new topic, or one that was already extensively addressed in previous courses? In addition, the extent to which the student then shows ownership of the topic of the project can provide the supervisor with valuable information. Finally, it was suggested that the *goals* of a master's thesis project might be complicated as both learning and assessment are important aims. Student goals in relation to the master's thesis, such as those described in **Chapter 5**, comprise aspects related to students' determination that supervisors were found to diagnose in **Chapter 7**. Thus, the different goals of students can provide supervisors with information on how to adapt their supervision strategies.

In addition to the suggestion that the characteristics of master's thesis projects provide several opportunities for adaptivity to take place during the supervision process, it is apparent from **Chapter 7** that numerous authors have hinted at that supervision should be adaptive to students' needs (Anderson, Day, & McLoughlin, 2006; Derounian, 2011; Deuchar, 2008; Gurr, 2001; Halse & Malfroy, 2010; Kam, 1997; Lee, 2008; Maxwell & Smith, 2011; McClure, 2005; Pearson & Brew, 2002; Todd, Smith, & Bannister, 2006; Wass et al., 2011). This is taken as an indication that the conclusions

of the studies in this dissertation with respect to adaptive supervision do not necessarily need to be considered local. Therefore, this dissertation claims that, given the specific characteristics of master's thesis projects, adaptivity is an essential concept in understanding the quality of the supervision process of master's thesis projects beyond the context of this specific study.

Secondly, this dissertation introduced the term 'adaptivity' in **Chapter 6**. Two other competing terms would have been 'responsiveness' (e.g., Anderson, Day, & McLaughlin, 2006) and 'contingency' (e.g., van de Pol, Volman, & Beishuizen, 2010). Other scholars have used the term responsiveness primarily to indicate that education should be responsive to the students' needs. However, implicitly these needs seem to be strongly related to students' wishes and preferences. Therefore, the term responsiveness was not adopted in this dissertation and it was opted to use another term to describe the adaptive nature of supervision that was found in the studies. With respect to contingency, van de Pol, Volman and Beishuizen (2010) indicated that this concept is also referred to as responsiveness, or tailored, adjusted, differentiated, titrated, or calibrated support. They describe contingency in terms of the teacher's support being adapted to the current level of the student's performance so that support should be either at the same or a slightly higher level. Thus, for contingency the emphasis is primarily on adapting support to the current level of the student, mainly at a cognitive level. However, the findings of this dissertation suggest an emphasis on adapting support to the current level or position of the student *in light of the goals of a task*, not only taking cognitive characteristics into account but also more metacognitive and affective characteristics, such as determination and context. Therefore the term 'adaptivity' was introduced, and it is proposed to conceptualise adaptivity as the extent to which a supervisor *aims to reach the goals, by means of adapting support strategies to the supervisor's perception of the specific needs of a student in order to reach these goals, based on the current performance of the student and metacognitive and affective student characteristics*.

Finally, this dissertation set an outline for a theoretical framework for adaptivity using literature concerning scaffolding and contingency (e.g., van de Pol, Volman, & Beishuizen, 2010; Van de Pol, Volman, & Beishuizen, 2011) in terms of diagnosing student characteristics, adapted support strategies and their interrelatedness (**Chapter 7**). It was found that supervisors diagnose cognitive aspects (such as different elements of student competence) and more affective and meta-cognitive aspects (such as students' determination and contexts) and apply adapted support strategies based on this information. These strategies can vary in terms of being more/less guiding and more/less explicit, providing more/less critical feedback, and sympathising with the student and his/her situation. With respect to the relation between diagnosis of student characteristics and adapted support strategies, it was found that their interrelatedness is not as straightforward as might be expected as relations between single characteristics and support strategies could not be established. Rather, the essence of adaptivity seems to be the complex relations between sets of student characteristics and sets of adapted support strategies that might even differ between supervisors. However, it should be noted that these findings need to be viewed as preliminary and that more research is needed to further develop a framework for understanding diagnosing strategies, strategies for adapted support, their interrelatedness and their relation to goals in master's thesis projects.

Master's thesis supervision: combining a feedback and interpersonal perspective

In **Chapter 4** of this dissertation, interaction effects between feedback perceptions and interpersonal perceptions were found. This indicates that these two perspectives should not in fact be investigated in isolation. In other words, in order to understand feedback processes in research supervision meaningfully, information about the interpersonal relationship between the supervisor and the student is also needed. Correspondingly, in order to understand the interpersonal relationship between a supervisor and a student in research supervision meaningfully, information about the feedback process is also needed.

In addition, it is suggested that both perspectives are helpful in order to explain the adaptive support strategies of supervisors that were found in **Chapters 6 and 7**. Some strategies can logically be interpreted from a feedback perspective, such as providing more or less critical comments and making standards, expectations and consequences more explicit. Also, some strategies can be more logically interpreted from an interpersonal relationship perspective, such as sympathising with the student (which can be interpreted as increasing the interpersonal affiliation) and changing the division of responsibilities (which can be interpreted as adapting the interpersonal control in a relationship). Therefore, this dissertation claims that when we aim to understand the quality of research supervision in terms of adaptivity, both a feedback and an interpersonal perspective are needed to interpret the variation in adaptive support strategies of supervisors.

Master's thesis supervision: conceptualising quality

Most studies concerning the quality of research supervision have only included one point of view on this quality (Armstrong, 2004; de Jong, 2006; Drennan & Clarke, 2009; Kam, 1997; Martinsuo & Turkulainen, 2011; Nelson & Friedlander, 2001; Pyhältö, Stubb, & Lonka, 2008; Seagram, Gould, & Pyke, 1998). For instance, de Jong (2006) investigated the efficiency of the interaction between supervisors and students. This dissertation aimed to extend her findings, by including both a student (**Chapter 2, 3 and 4**) and an institutional point of view (**Chapter 5, 6 and 7**) on quality of supervision. The findings have shown that taking more than one point of view gives a richer view of the quality of supervision. For instance, the findings provide insight into the goal-relatedness of supervision from both a student and an institutional point of view on the quality of supervision. This resulted in the insight that students are more satisfied and perceived that they learn more from their supervisor when the feedback is perceived as being highly goal-related and that the goal-relatedness of supervision can be enhanced by supervisors providing adaptive supervision.

Feedback

This dissertation makes three main contributions to theory about feedback. The first contribution concerns the conceptualisation and operationalisation of feedback. In the theoretical framework set out in the Introduction (**Chapter 1**), a general conceptualisation of feedback was suggested: *feedback is information about a student's performance and/or understanding in the context of a task*. Subsequently feedback can be operationalised from at least three positions: sender's, receiver's, or observer's position. Based on these three positions it is now proposed that it is less relevant to

determine what information is feedback or not, but rather it is relevant to describe whether information is seen as feedback from a specific position:

- Is the information *intended* to be feedback by a sender and if so, is it intended to be about a student's performance and/or understanding?
- Is the information *perceived* or *used* as feedback and if so, is it perceived and used as information about a student's performance and/or understanding?
- Does the information refer to a student's performance and/or understanding and if so, is the information feedback from an observer's point of view?

Distinguishing a general conceptualisation of feedback from the possible point of views that can be taken to operationalise feedback is a contribution to current theory about feedback as it emphasises that what is seen as feedback can differ between different positions and thus between individuals.

The second contribution concerns insight into the structure of student perceptions of the focus, elaboration and goal-relatedness of feedback and their importance in predicting student satisfaction and perceived supervisor contribution to learning, as described in **Chapter 2** and **4**. The findings have shown that with respect to feedback focus, students seem to distinguish between feedback focused on task and feedback focused on self-regulation. Several researchers have categorised the focus of feedback; for instance, Kluger and Denisi (1996) state that feedback can focus attention on task learning, task motivation and meta-tasks, whereas Hattie and Timperley (2007) argue that feedback can focus on task, process, self-regulation and the self. This dissertation adds to such research by providing some initial insights with respect to how students perceive the focus of feedback in master's thesis supervision. In addition, feedback elaboration was perceived in terms of positive and negative elaboration rather than in terms of what, how, and why, as defined by Shute (2008). These findings contribute to our understanding of how students perceive feedback, indicating that they seem more concerning with the feedback sign (positive or negative), rather than the extent to which the feedback is supported with arguments. While some authors (Sadler, 1989; Hattie & Timperley, 2007) have made a distinction between 'feedback' and 'feed forward', in terms of the goal-relatedness of feedback in this research, students seem to distinguish between 'feed up' on the one hand, and 'feed back' and 'feed forward' on the other hand,. It is suggested that this finding might be specific for contexts in which the feedback process is rather cyclical, like the master's thesis project, as attention can be paid concurrently to how students are doing as well as to the next steps to take.

Thirdly, with respect to goal-relatedness, the findings in **Chapter 6** showed that goal-relatedness in terms of the up, back, and forward components can be established in research supervision by providing adaptive supervision. Thus, the findings of Sadler (1989) and Hattie and Timperley (2007) with respect to the three components are elaborated and built upon in the specific context of research supervision.

Interpersonal relationships in education

Thus far, interpersonal teacher–student relationships have predominantly been investigated in secondary and primary education rather than in higher education, and in classroom settings rather than in one-on-one settings (e.g., den Brok, Brekelmans, & Wubbels, 2004; Kim, Fisher, & Fraser, 2000; Lang, Wong, & Fraser, 2005; Mainhard, Brekelmans, den Brok, & Wubbels, 2011; Pianta &

Stuhman, 2004; van Tartwijk, Brekelmans, Wubbels, Fisher, & Fraser, 1998; Wubbels & Brekelmans, 2005; Zijlstra, Wubbels, Brekelmans, & Koomen, *in press*). The findings in **Chapter 3** and **4** of this dissertation contribute to the understanding of interpersonal relationships in educational contexts by investigating such relationship in higher education and in a one-on-one situation. One of the two main findings is that in the context of research supervision, student perception of supervisor affiliation is a very strong predictor of student satisfaction and the perceived contribution of the supervisor. Interestingly, in the context of secondary education, affiliation was found to be more important than control for affective outcomes, such as subject-specific motivation, but control was more important for cognitive outcomes (Wubbels & Brekelmans, 2005). Student satisfaction might be considered an affective outcome, but supervisor contribution to learning might be considered a self-reported cognitive outcome. Therefore, control and affiliation seem to play a different role in a one-to-one higher education situation than in a secondary classroom situation.

The second main finding is that the relation between student perceptions of supervisor control and the perceived contribution of the supervisor was moderate and positive; more importantly, the relation between control and student satisfaction was found to be quadratic in that too much control was related to a decrease in student satisfaction (**Chapter 3**). Again this is contrary to findings in secondary classroom situations in which no quadratic effects have so far been investigated or found (Wubbels & Brekelmans, 2005).

Possible explanations for these findings with respect to control and affiliation in this specific context could be that a classroom situation would ask for more interpersonal control than a dyadic situation; in a classroom situation, possibly more than twenty learning processes need to be fostered compared to only one learning process in a dyadic situation. Another explanation could be that students in secondary education need more interpersonal control from their teachers than do higher education students, as the latter have developed into more self-regulated learners. With respect to affiliation, it could be the case that as students work on their master's thesis projects individually, they have a greater need for relatedness or closeness with others than in a situation in which they have classes and cooperate with peers.

8.3 Limitations

Conceptual limitations

Feedback perspective

This dissertation operationalised a feedback perspective in terms of student perceptions in master's thesis projects with respect to goal-relatedness, focus, and elaboration based on the review studies of Hattie and Timperley (2007) and Shute (2008). The reason for this was that the review studies indicated that these were effective elements of feedback and therefore it was assumed that these elements could also be relevant for investigating student perceptions of feedback. However, this also meant that the feedback perspective was narrowed down and that other possibly relevant elements were not included, such as timing and amount of feedback. Another strategy could have been to conduct open interviews with students concerning feedback from their supervisor on their master's

thesis and then deduce the elements that they talk about and construct items based on such interviews.

In addition, with respect to goals in master's thesis projects, in the chapters of this dissertation, goals were described and investigated in different ways. First, in the questionnaire on students' feedback perceptions the main items concerning the goal-relatedness of feedback refer to a product goal: writing a good thesis. Second, in Chapter 5, goals were described in terms of curricular and personal goals and in terms of own goals and perception of other goals. Third, in the interview scheme of Chapter 6, three types of goals were distinguished, namely goals of the master's thesis, goals of the supervision, and goals of a specific meeting. These different ways of approaching goals have consequences for what goal-relatedness means. In Chapters 2 and 4, goal-relatedness refers to feedback in terms of the product goal of writing a master's thesis, which is mostly related to the curricular goals of Chapter 5. In Chapter 6, the feed up component of goal-relatedness, described by supervisors as being the same for all students, also refers to the curricular goals of the master's thesis. However, as seen in Chapter 5, besides curricular goals, personal goals can also be pursued by both supervisors and students. The use of all these different goals in the different chapters might be confusing and complex, and therefore care should be taken when drawing conclusions with respect to the goals of master's thesis projects.

Interpersonal perspective

Interpersonal theory claims that all interactions between people can be typified as comprising a combination of a degree of control and affiliation (e.g., Fiske, Cuddy, & Glick, 2006; Judd et al., 2005), with these dimensions being independent and combined in a circumplex model (e.g., Kiesler & Auerbach 2003; Leary 1957). Yet, in this research (Chapters 3 and 4) control and affiliation were found to be significantly related, which would be a violation of the underlying theoretical model. This might be an indication that the questionnaire is of insufficient quality or that the sample is not representative of the population. Another explanation might be that in the context of master's thesis supervision, not all types of possible supervisor behaviour occur. For instance, combinations of high affiliation and low control (e.g., complying supervisor behaviour), or high control and low affiliation (e.g., reprimanding supervisor behaviour) might occur only rarely. This would lead to less variation in certain areas of the dimensions, leading to a less dispersed scatterplot, indicating a relation between the two dimensions.

Also, in the analyses, Control and Affiliation were included as separate predictors rather than using combination scores of both dimensions following the circumplex structure such as sector scores or vector scores. Therefore, even though the findings provide valuable insight into the individual importance of the dimensions, it remains unclear how combinations of both dimensions would relate to student satisfaction, to perceived supervisor contribution to learning and to feedback perceptions. More specifically, it was found that Affiliation was a very strong predictor of student satisfaction and perceived supervisor contribution to learning. But it remains unclear whether this relation would be the same in combination with higher or lower levels of perceived Control.

Quality of supervision

In the studies of this dissertation, several point of views on the quality of supervision were employed. In Chapters 2, 3, 4, and 8, a student point of view was taken, applying student satisfaction and student perceptions of the supervisor's contribution to their learning as a conceptualization of the quality of supervision. In Chapters 5, 6, and 7, an institutional point of view was used, by collecting data from supervisors with a local reputation of being 'good' supervisors. However, a more complete understanding of the quality of supervision would have been generated when even more points of view and/or measures were included. For instance, the supervisor's point of view on quality of supervision was not included. This could, for instance, have been conceptualised in terms of supervisor satisfaction, supervisors' perceptions of student learning, and/or supervisors' perceptions of students' take up of feedback. Besides applying a supervisor point of view for mapping student learning, another measure that could be used is students' final grades on the thesis, corrected for their earlier grade point average (GPA). Unfortunately, due to the privacy regulations of the university at which the data were collected, this was not possible.

Also, Chapter 5 indicated the wide range of goals that could be pursued with master's thesis projects. Clearly, these kinds of goals could also be measured in order to establish whether the supervision was of sufficient quality. Examples of such goals would be completion rates, attitudes towards science, research self-efficacy, and impact on practice of the thesis. However, these goals are not only impacted by the quality of the supervision process of a master's thesis project, so when using such goals as quality indicators for supervision, they should be corrected for students' prior achievement and pre-existing attributes. This might provide additional information in terms of the quality of the supervision process from a student point of view, as these goals more closely represent students' own goals.

Adaptivity

In Chapter 7 of this dissertation, adaptivity was investigated in terms of student characteristics that provide a basis for adaptive support strategies. These characteristics were described at a general level as stable characteristics of students. However, it is reasonable to assume that supervisors not only adapt to general student characteristics, but that they also adapt to more situational characteristics of students; these might, for instance, be related to the different phases of doing research (i.e., planning, collecting, analysing and reporting) or to the possibly transformational learning process of students becoming professionals. Therefore, the diagnostic element of adaptivity might have been framed too narrowly as concerning only students' general characteristics rather than taking into account more situational characteristics.

Methodological limitations*Stability of perceptions and goals*

As already noted in the individual chapters (Chapters 2, 3, 4, and 5), student perceptions of supervisor feedback, the supervisor–student relationship, and student and supervisor goals were measured at only one time point during the master's thesis project. However, this is not to say that perceptions and goals are stable during the whole project. In line with Boekaerts, de Koning, and de Vedder (2006), it

is expected that higher order goals (e.g., I want to be successful) are relatively more stable than lower order goals (e.g., I want to do my homework every day). In the studies in this dissertation, perceptions and goals were measured at a general rather than a specific level. For instance, students were asked to respond to how they perceived the feedback of their supervisor in general rather than in a specific instance. Also, with respect to the supervisor–student relationship, this was asked at a general level and not in relation to a specific meeting with the supervisor. By measuring these perceptions at a general level, the aim was to measure more or less stable perceptions. Nonetheless, students’ general perceptions of the supervision process might be highly influenced by the last meeting or feedback instance. As this has not been explored empirically, the stability of the measures cannot be assumed. Variability in these perceptions would indicate that once (un)favourable perceptions are established, these still can be subject to change.

Concerning the goals that were investigated, three levels were included, ranging from more general to more specific: goals of the thesis, goals of the supervision and goals of a specific meeting. It is expected that the goals of a specific meeting are less stable than the goals of the thesis. However, the goals of the thesis might not be stable. For instance, it is possible that the students’ goals develop and change during the course of a master’s thesis project as they approach the completion of their educational programme.

Self-reports

In most of the studies only self-reported data were used: students’ self-reports concerning their learning and their supervisor’s contribution (Chapters 2, 3, 4 and 8), students’ and supervisors’ self-reported goals (Chapter 5), and supervisors’ self-reported supervision strategies (Chapters 6 and 7). However, in Chapter 6, supervisors’ self-reported supervision strategies in terms of providing adaptive supervision were to some extent triangulated with data from student interviews that confirmed the adaptive nature of supervision. Nonetheless, the use of self-reports for measuring student learning is disputed by some scholars because low correlations are regularly found between students self-reported learning and more objective and longitudinal measures of learning (e.g., Bowman, 2010). This signifies that based on these findings, no conclusions can be drawn about what happens and should or should not happen in the actual supervision meetings, but that the scope of the conclusions is limited to the intentions and perceptions of supervisors and students.

Sample sizes of qualitative studies

The two qualitative studies of this dissertation had limited sample sizes (12 supervisor–student dyads in Chapters 5 and 6; five supervisors in Chapter 7). In the interview study with the supervisor–student dyads the aim was to generate some variance by including dyads from three different faculties and including supervisors from different phases in their academic career. However, these findings should be considered a first exploration of goals, the goal-relatedness of supervision and adaptivity in research supervision that are not generalizable.

In the group discussion study, the decision to include only five supervisors was deliberate as the aim was for these supervisors to have an active role in setting the agenda for the group discussion meetings. Related to this, Bronkhorst, Meijer, Koster, Akkerman, and Vermunt (*in press*) have

indicated that collaboration with teachers in research studies can benefit the quality of the research. For instance, the agency of participating teachers leads to research being more embedded in existing practice and thereby enhancing the truth value or internal validity of the study. In order to be able to do justice to the expert knowledge of expert thesis supervisors, it was deemed important not to include too many participants. However, this has consequences for the generalizability of the findings. Strictly speaking, the findings can only be generalised to supervisors with a local reputation for being good at supervision in the three specific faculties of Utrecht University, who were willing to invest time in thinking about and discussing master's thesis supervision. However, as suggested earlier, given the fact that other researchers have also alluded to supervisors adapting their supervision to differences between students, it seems that the findings are to some extent generalizable.

8.4 Suggestions for further research

Conceptual suggestions

Role of focus in feedback perceptions

In the studies concerning student perceptions of feedback, the perception of a focus of feedback on task was found to be a weak factor and was only minimally related to student satisfaction and perceived supervisor contribution to learning. This is surprising given that in earlier review studies and meta-analyses the focus of feedback was described as an important aspect of feedback since it guides the students' attention to or from the task at hand (Hattie & Timperley, 2007; Kluger & DeNisi, 1996; Shute, 2007). Future research could address whether feedback focused on the task is indeed less important in one-on-one situations in higher education, such as that in the master's thesis. Another possibility is that the focus of feedback could be measured with greater accuracy in a way other than that adopted in this dissertation. For instance, including more questions in order to cover the task of undertaking a master's thesis project to a greater extent, or using open questions rather than closed questions in order to avoid items concerning elements that are not (yet) applicable to a student's master's thesis project (e.g., 'The feedback from my supervisor concerns the methods of my study').

Supervisor adaptivity

As the findings in this dissertation are only a first exploration of the concept of adaptivity in research supervision, it is suggested that these findings could be elaborated upon with (larger) groups of (expert) thesis supervisors at other universities and possibly in other countries. In particular, with respect to the tensions that were found, it could be that these are specific to a university or to a country. In addition, it would be interesting to contrast these findings with those based on data from other groups of supervisors such as novice supervisors, supervisors with a local reputation of being weak, or supervisors with low self-efficacy concerning research supervision. This would provide insight into the extent to which adaptivity is a characteristic of expert research supervisors specifically.

In addition, as already suggested in the limitations identified in this chapter, this dissertation has focused only on more general student characteristics. Future research might also focus on differences within students from meeting to meeting. These differences might be explained in terms of the different phases of doing research or the learning processes of the student.

Also, in terms of further exploration of the concept itself, it would be interesting to relate adaptivity to other variables. In the light of this dissertation, it could be of value to investigate how adaptivity relates to student perceptions of goal-relatedness in order to test the assumption that more adaptive supervision leads to higher perceptions of goal-relatedness. Such studies might indicate whether there are more conditions to be met in order for students to perceive goal-related supervision as being such. Also, it does not seem too farfetched to expect that higher levels of supervisor adaptivity might be related to higher levels of perceived affiliation since in some instances affiliation is even defined as ‘the extent to which a teacher is in touch with the students’ needs and whether she anticipated problems and concerns students might have’ (Mainhard, 2009, p.8).

Lastly, with respect to adaptivity, it would be interesting not only to shed light on the role of the supervisor in this process but also the role of the student. After all, in order for a supervisor to accurately diagnose the students’ characteristics and needs, students have to be willing to share this information. One could investigate how students can contribute to this process of adaptivity and support their supervisor in providing adaptive supervision. As mentioned, this is not to say that supervision should be driven by the wishes of students, but by what specific students in specific situations need in order to reach the goals of the master’s thesis.

Methodological suggestions

Longitudinal studies

In order to understand how student perceptions of feedback and of the supervisor–student relationship might develop over time, longitudinal studies are needed. Related to this, studies in secondary education have indicated that student perceptions of the interpersonal teacher–class relationship are rather stable throughout the first month of the school year (Mainhard, Brekelmans, den Brok, & Wubbels, 2011), but also that specific instances of coercive and supportive teacher behaviour had small effects on perceptions of the interpersonal teacher–class relationship (Mainhard, Brekelmans, & Wubbels, 2011). These findings indicate that the relation between teachers and students is rather stable, but can still be influenced by significant instances. However, to the best of our knowledge, such studies have not yet been conducted in a one-on-one context or in higher education and it would be interesting to do so in order to gain better understanding of the development of perceptions during the supervision process between a supervisor and a student.

When addressing the stability of perceptions, it could be helpful to distinguish between different forms of stability (Tracy & Sodano, 2008): relative stability, which is comparable to a test–retest correlation, for instance the correlation between the questionnaire scores of one student at two different moments; absolute stability, which concerns absolute increases or decreases in scores, in this case perceptions, over time; structural stability, which relates to the internal structure of items measuring a single variable or set of variables, for instance whether the factor solution that was found for feedback perceptions and the significant relation between control and affiliation would remain

stable over time; profile stability, which concerns the extent to which the relation between variables remains the same over time, for instance the interaction effects that were found for feedback and interpersonal perceptions.

Also, with longitudinal studies it would be possible to address how perceptions of feedback and the interpersonal relationship (or other aspects of the supervision process) possibly influence each other over time. A way of doing so would be to administer questionnaires multiple times during the supervision process and then model the data using cross-lagged panel regression models (e.g., Burkholder & Harlow, 2003) in which the effect of variable A at time point 1 on variable B at time point 2 is estimated, while controlling for the effect of variable B at time point 1 on variable B at time point 2 and vice versa.

Multilevel studies

The findings in Chapters 1 and 3 of this dissertation are based on more than a thousand student questionnaires concerning their perceptions of feedback and their interpersonal relationship with their supervisor. Interestingly, the findings with respect to adaptivity in Chapters 6 and 7 might raise the question as to whether different students' perceptions of the same supervisor are comparable in terms of feedback, the supervisor–student relationship, student satisfaction, and the perceived supervisor contribution to their learning, as this supervisor might use different supervision strategies for each student. In order to investigate this issue, multilevel studies would need to be conducted in order to investigate the extent to which students' perceptions of the same supervisor are shared in terms of the intraclass correlation. A first exploration with respect to this issue was done, based on questionnaires from 192 students of 46 supervisors (de Kleijn, Meijer, Pilot, & Brekelmans, 2012). The findings indicated no significant intraclass correlation for perceived supervisor contribution to learning, interpersonal affiliation, perceptions of feedback as focused on task, negative elaboration, and feedback-forward. This would indicate that the perceptions of students with regard to the same supervisor are not comparable for these variables. For student satisfaction, interpersonal control, perceptions of feedback as focused on self-regulation, positive elaboration, and feedback-up, a significant intraclass correlation was found ranging from .18 to .25. This would indicate that on these variables, students do to some extent share perceptions of the same supervisor. However, studies with larger samples and larger numbers of students per supervisor are needed in order to provide more insight into the extent to which student perceptions of supervisors are shared.

Observational studies

In order to investigate adaptivity in more real-time situations, observational studies are needed in which the conversations between supervisor and student are audio recorded or videotaped. In addition to these observations, supplementary data would be needed about the supervisor's interactive cognitions that could be collected with stimulated recall methods (e.g., Lyle, 2003). Such studies would contribute to theory about how adaptivity takes place in supervision meetings between supervisors and students and ultimately about how this could be optimised.

8.5 Practical implications

Supervisors

Based on the findings presented in this dissertation, some practical suggestions can be provided to master's thesis supervisors. Certain suggestions seem to be applicable to supervision in general and thus to all students and others are related to the notion of adapting the supervision to specific students. The most important and possibly innovative implication is probably to be adaptive as a supervisor in order to establish goal-related supervision. In other words, it is important for supervisors carefully to consider the student in front of them and what this student might need in order to improve their thesis and to learn. For instance, supervisors can take into account students' competence (to what extent is this student able to think abstractly?), their determination in terms of motivation (what is the main drive for this student with respect to his/her master's thesis project?), as well as commitment (to what extent does this student put effort into his/her thesis project?) and students' contexts (what are the career plans of this student?). Accordingly, for instance, interpersonal control can be balanced and be adapted to a student's needs. Also, a supervisor can decide to be more explicit with a particular student about standards, criteria, current performance level and/or the supervisor's (dis)satisfaction, or can change the division of responsibilities.

Second, this notion of adaptivity and students having different needs implies the realization for supervisors that different students might react differently to the same supervision strategy and that flexibility in supervision strategies might be advisable. However, it must be noted that this might imply a certain vision of education as one of the supervisors interviewed in Chapter 6 explicitly indicated that students should adapt to their teachers and not vice versa.

Third, it is suggested that supervisors should actively invest in creating warm and caring relationships as this was found to be most strongly related to student satisfaction and to student perceptions of the contribution of their supervisor to their learning process. In order to establish such relationships, in secondary education, Wubbels and Brekelmans (2005) suggest teachers show interest, behave in a friendly manner, be able to make a joke, inspire confidence and trust, listen with interest, empathise, look for ways to settle differences, and be open.

Fourth, it is suggested that supervisors, as well as providing constructive negative feedback, need to be aware of giving positive feedback too. Related to this, it is important to note that positive feedback is about what students are *specifically* doing well, so that they can continue doing this and can apply it in other situations, so it is not just about giving compliments to students.

Fifth, it seems to be worthwhile to invest in clarifying the goals of a master's thesis project to students as feed up is related to student satisfaction and the perceived contribution of the supervisor; students do not perceive receiving much feed up and the goals of supervisors and students often differ. It might be necessary not only to discuss goals in the first meeting, but also at several instances during the process.

Institutions

The research findings indicate that providing master's thesis supervision is not an easy task, is not always optimal, and can lead to tensions for supervisors. Therefore, it is suggested that at an institutional level, supervisor professionalization or peer support should be facilitated, at least for beginning supervisors or more experienced supervisors who encounter difficulties in supervising master's theses and indicate a willingness or even need to engage in such activities.

Based on the experiences in the studies in this dissertation, it is suggested that supervisor professionalization would include group meetings, whether or not with an educational consultant or educational researcher, in which supervisors can exchange experiences, learn from each other, and are supported to interpret their experiences and possible struggles in relation to theory of research supervision. In fact, the greater part of the supervisors who participated in the interview studies indicated that they appreciated that the interview provided them with some time to reflect on their supervision strategies. They remarked that this was something that they hardly had the time for in their daily practice.

Also, using small log files in order to reflect on specific supervision meetings with some students seems to be a useful way to support supervisors' reflection on their supervision. Discussing these in small groups might lead to new insights. In addition, it is suggested that supervisor professionalization might specifically address the notion of adaptivity in supervision in order to support supervisors in becoming aware of the fact that different students might need different supervision strategies to complete a master's thesis project successfully. For instance, this could be a basic element of professionalization trajectories in which teachers in higher education gain their teaching qualification, such as the basic and senior qualifications in higher education in the Netherlands (in Dutch: basis- en seniorkwalificatie; de Jong & van Keulen, 2007).

Additionally, as well as possible suggestions for supervisor professionalization, the findings of this dissertation also indicate that some characteristics of master's thesis projects provide excellent opportunities for providing adaptive supervision, such as the duration of such projects in combination with the one-on-one interaction between supervisor and student. However, the time that supervisors have available for supervising research projects such as the master's thesis is under pressure and has severely restricted in the past decades. At Utrecht University, for instance, supervisors have 16 hours for supervising a master's thesis. An implication of the findings of this dissertation is that the time available for master's thesis supervision should allow the supervisor and student to become acquainted and permit the supervisor to establish what specific students need in order to reach the curricular goals of a master's thesis project.

Students

Finally, even though in this dissertation student behaviour was not studied, the findings concerning adaptivity in research supervision do have implications for students. After all, adaptivity implies the importance of students being willing to share with their supervisor the information that is needed to provide adaptive supervision. In other words, if a student is not willing to share information about their situation, it can be very difficult for supervisors to provide adaptive supervision. By providing

information about their situation, students can contribute to an adaptive supervision process from which they can benefit directly.

In addition, the findings of this dissertation show that students seem to prefer high levels of supervisor interpersonal affiliation. This was explained by the fact that students work independently and in general have no contact with peers and therefore need extra support from their supervisors. Therefore, not only should the importance of supervisors creating warm relationships be addressed, but also students can be supported by affording them the opportunity to share their experiences and struggles with peers, for instance by introducing peer groups. These groups can provide personal support in addition to the support of the individual supervisors (Dysthe, Samara, & Westrheim, 2006).

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Samenvatting

In de meeste academische masterprogramma's in Nederland vormt de masterthesis een wezenlijk slotstuk van de opleiding: studenten (moeten) laten zien dat zij zelfstandig onderzoek kunnen doen. De masterthesis is omvangrijk en brengt specifieke mogelijkheden en uitdagingen met zich mee voor studenten en hun begeleiders.

In **Hoofdstuk 1** wordt de opzet van dit proefschrift beschreven. We laten zien dat een masterthesis op tenminste vier belangrijke punten verschilt van reguliere vakken in de academische masterprogramma's: (1) de omvang in termen van studiepunten is groter, waardoor de duur langer is; (2) de student mag grotendeels zelf het onderwerp en de onderzoeksopzet bepalen; (3) het contact tussen student en begeleider is een-op-een; en (4) het doel is dat de studenten laten zien dat zij voldoende in staat zijn om zelfstandig een onderzoeksproject uit te voeren.

Het feit dat de studenten een onderwerp mogen kiezen, maakt dat ze de gelegenheid krijgen om zicht te verdiepen in een onderwerp wat ze zelf interessant vinden, waardoor ze daadwerkelijk 'eigenaar' worden van hun masterthesis en de problematiek die daarin behandeld wordt. Daarnaast brengt de masterthesis specifieke uitdagingen voor de studenten met zich mee. Ten eerste moeten studenten vaak zelf concrete deadlines stellen. Daarnaast moeten zij - inherent aan de keuzevrijheid met betrekking tot onderwerp en opzet - zelf greep krijgen op de criteria en standaarden waaraan hun masterthesis moet voldoen. Dit kan leiden tot studievertraging, gevoelens van gebrek aan sturing en tot onzekerheid. Begeleiders, op hun beurt, kampen soms ook met gevoelens van onzekerheid. Ze zijn meestal niet opgeleid als begeleiders van een masterthesis. Vaak baseren zij zich in hun begeleiding op hun eigen ervaringen als student.

De prominente plek van de masterthesis in het academische curriculum, de specifieke kenmerken ervan en het feit dat de masterthesis en de begeleiding daarvan nog weinig onderzocht zijn, vormen tezamen de aanleiding voor dit onderzoek. Het doel is om inzicht te verkrijgen in de kwaliteit van de begeleiding van studenten die aan een masterthesis werken.

De kwaliteit van de begeleiding kan op verschillende manieren in kaart gebracht worden. Zo kan bijvoorbeeld gekeken worden naar de uiteindelijke duur van het project, studenttevredenheid, het welzijn van de student of de efficiëntie van de interactie tussen begeleider en student. Deze variabelen kunnen vervolgens beoordeeld worden door de student, de begeleider of door een onafhankelijk onderzoeker. In dit proefschrift is het uitgangspunt dat niet één manier en beoordelaar het beste is en daarom wordt de kwaliteit op verschillende manieren bekeken. We hebben dit gedaan door (1) studenten te vragen naar hun tevredenheid over de begeleiding; (2) studenten te vragen naar de bijdrage van de begeleider aan hun leren, en (3) begeleiders te interviewen waarvan we reden hebben om te denken dat hun begeleiding van bovengemiddelde kwaliteit is, omdat ze genomineerd zijn geweest voor de 'docent van het jaar'-prijs en/of een goede reputatie hebben als begeleider bij hun decaan. Daarnaast werd gekozen voor een benadering vanuit twee perspectieven: een cognitief perspectief, toegespitst op de feedback van de begeleider, en een sociaal-emotioneel perspectief,

toegespitst op de begeleider-studentrelatie. De overkoepelende onderzoeksvraag van dit proefschrift was: *hoe kan de kwaliteit van masterthesis begeleiding begrepen worden in termen van de feedback en de begeleider-student relatie?* In zes empirische hoofdstukken hebben we vervolgens op verschillende manieren naar een antwoord op deze onderzoeksvraag gezocht.

In **Hoofdstuk 2** onderzochten we de studentpercepties van feedback. De onderzoekspopulatie bestond uit 1016 studenten die de percepties van de feedback van hun begeleider onderzocht. We keken naar hun tevredenheid over de feedback die ze van hun begeleider kregen en hoe ze diens bijdrage aan hun leren ervoeren. De feedbackpercepties werden gemeten met een hiertoe ontwikkelde vragenlijst waarin de volgende thema's centraal stonden: (1) de focus van feedback (waar gaat de feedback over?), (2) de onderbouwing van feedback (in hoeverre is aangegeven wat goed/nog niet goed is en waarom?) en de (3) doelgerichtheid van feedback (in hoeverre houdt de feedback verband met de curriculaire doelen?).

Een factoranalyse wees uit dat percepties van de focus in de feedback (1) met name beschreven konden worden in termen van taak en zelfregulatie, percepties van onderbouwing (2) in termen van positieve en negatieve onderbouwing en percepties van doelgerichtheid (3) in termen van informatie over de doelen (feed up) en terug- en vooruitkoppeling (feed back-forward). Daarnaast werd met behulp van structurele vergelijkingsmodellen gevonden dat studenten die de feedback van hun begeleider in hoge mate ervoeren als positief en terug- en vooruitkoppeland, het meest tevreden waren. Zij gaven ook aan een grotere bijdrage van hun begeleider aan hun leren te ervaren. Dit geldt, weliswaar in mindere mate, ook voor de focus op de taak en voor de informatie over de doelen. Tenslotte viel op dat studenten aangaven überhaupt weinig informatie over de doelen te krijgen in/naar hun ervaring.

De bevindingen uit dit hoofdstuk lieten dus zien hoe studenten de focus, de onderbouwing en de doelgerichtheid van feedback in de masterthesisbegeleiding ervaren en hoe deze percepties samenhangen met de kwaliteit van de masterthesisbegeleiding.

In **Hoofdstuk 3** stond de begeleider-student relatie centraal in termen van de twee interpersoonlijke dimensies 'invloed' en 'nabijheid'. De dimensie 'invloed' beschrijft de mate waarin een begeleider de studentactiviteiten bepaalt en de dimensie 'nabijheid' beschrijft de emotionele afstand tussen begeleider en student. We onderzochten de percepties van de begeleider-student relatie van 401 studenten. Op basis van eerdere onderzoeken in het voortgezet onderwijs werd verwacht dat meer invloed en nabijheid van een begeleider zouden samenhangen met een hogere studenttevredenheid met de begeleiding, een grotere ervaren bijdrage van de begeleider aan hun leren en hogere cijfers.

De toepassing van structurele vergelijkingsmodellen liet zien dat hoe meer studenten hun begeleider als nabij ervoeren hoe tevredener ze waren, hoe groter de bijdrage van hun begeleider aan hun leren ervaren werd en hoe hoger hun behaalde cijfers waren. Ook gold dat hoe meer studenten invloed ervoeren van hun begeleider, hoe groter de ervaren bijdrage aan hun leren van de begeleider. Voor de studenttevredenheid trad echter een plafondeffect op, dat wil zeggen dat te veel invloed juist gepaard ging met minder studenttevredenheid. De relatie tussen invloed en het eindcijfer van studenten had een U-vorm, wat betekent dat de studenten die een gemiddelde mate van invloed

ervoeren, de laagste cijfers kregen en dat studenten die juist veel of weinig invloed ervoeren bij hun begeleider hogere cijfers kregen.

De resultaten uit dit hoofdstuk lieten daarmee zien hoe de twee dimensies van de begeleider-student relatie samenhangen met de kwaliteit van masterthesisbegeleiding.

In **Hoofdstuk 4** werd de relatie tussen enerzijds de feedbackpercepties en percepties van de begeleider-student relatie, en anderzijds de kwaliteit van masterthesisbegeleiding in termen van studenttevredenheid en de gepercipieerde bijdrage van de begeleider, in samenhang onderzocht.

Regressieanalyses op de vragenlijstgegevens van dezelfde 1016 studenten uit hoofdstuk 2 wezen uit dat ‘nabijheid’ voor beide maten voor kwaliteit (studenttevredenheid en gepercipieerde bijdrage van de begeleider) veruit de krachtigste voorspeller was. Voor studenttevredenheid was ‘terug- en vooruitkoppeling’ de tweede beste voorspeller en voor de gepercipieerde bijdrage van de begeleider was dat ‘invloed’. Daarnaast werden interactie-effecten gevonden tussen een aantal feedbackperceptieschalen en de interpersoonlijke dimensies. Deze duiden erop dat in begeleidingssituaties waarin de student geen optimale begeleider-student relatie ervaart, feedbackpercepties de kwaliteit van de begeleiding nog sterker beïnvloeden.

Dit liet zien hoe belangrijk het is dat begeleiders nabije relaties opbouwen met hun studenten, en dat - wanneer dat niet lijkt te lukken - zij extra goed moeten letten op de focus, onderbouwing en doelgerichtheid van de feedback die ze aan de student geven.

In **Hoofdstuk 5** borduurden we voort op de bevindingen uit hoofdstuk 2, waarin we lieten zien dat studenten in het algemeen ervaren weinig informatie te krijgen over de doelen (feed up), en dat zowel informatie over de doelen als terug- en vooruitkoppeling een deel van de studenttevredenheid en de ervaren bijdrage van de begeleider aan het leren van de student kunnen verklaren. We hielden interviews met twaalf begeleiders (met een goede reputatie als begeleider) en een van hun studenten en zochten een antwoord op de vraag wat de doelen van begeleiders en studenten waren en hoe die zich tot elkaar verhielden. Bij de analyse van de interviews werden codeerschema’s gebruikt die zowel curriculaire doelen als persoonlijke doelen onderscheidden.

De resultaten lieten zien dat de meeste studenten en begeleiders zowel curriculaire als persoonlijke doelen nastreefden met de masterthesis. Dit verklaarden we aan de hand van de overgangsfase waarin studenten zitten die een masterthesis schrijven. Ze maken de overgang van student naar professional. De masterthesis is meestal het laatste onderdeel van de studie, waarna de studenten hun masterdiploma behalen en de arbeidsmarkt op gaan. Binnen de begeleider-student koppels werd gevonden dat de doelen van begeleiders en studenten behoorlijk van elkaar kunnen verschillen en dat zij dit regelmatig niet in de gaten hebben van elkaar. Daarnaast lieten de resultaten zien dat begeleiders met name het doel van de student om zijn/haar diploma te halen herkennen.

De bevindingen uit dit hoofdstuk laten dus zien dat binnen student-begeleider koppels een grote variatie aan doelen nagestreefd kan worden bij het werken aan een masterthesis en dat beiden slechts in beperkte mate elkaars doelen herkennen.

Op basis van de bevindingen uit hoofdstuk 5, werd in **Hoofdstuk 6** vervolgens getracht verder inzicht te verwerven in hoe doelen een rol spelen in de begeleiding van studenten die aan een masterthesis werken. Daartoe werden de interviews met begeleiders en studenten met betrekking tot de doelen van de masterthesis nogmaals geanalyseerd. Een terugkerend thema in zowel de begeleider- als de studentinterviews, bleek een 'adaptieve' invulling van de begeleiding te zijn. Dat wil zeggen dat de begeleiders en de meeste studenten opmerkten dat begeleiders hun begeleiding aanpassen aan de individuele student. Vervolgens werden de interviewfragmenten die hier betrekking op hadden inhoudelijk geanalyseerd.

Om deze benadering te beschrijven, werd het concept 'adaptiviteit' geïntroduceerd. Adaptiviteit werd als volgt geconceptualiseerd: de (curriculaire) doelen van een masterthesis zijn weliswaar in grote lijnen voor alle studenten hetzelfde, maar op basis van waar een student staat en wat zij/hij nodig heeft om de doelen te bereiken, passen begeleiders hun begeleidingsstrategieën aan. Ook bleek uit de begeleiderinterviews dat het niet eenvoudig is om adaptief te begeleiden en dat het moeilijkheden met zich mee kan brengen zoals de afweging van de mate waarin een begeleider de activiteiten van een student reguleert en de mate waarin de begeleider kritische opmerkingen geeft.

In **Hoofdstuk 7** werd het concept adaptiviteit verder uitgewerkt aan de hand van twee groepsinterviews met vijf begeleiders met een goede reputatie. Daarnaast werden zij ook individueel geïnterviewd. Tijdens de groepsinterviews bepaalde de onderzoeker in overleg met de deelnemende begeleiders welke onderwerpen met betrekking tot adaptiviteit besproken werden. Dit leverde onder andere een overzicht van verschillende typen studenten op, die de begeleiders op basis van hun ervaring benoemden, met bijbehorende studentkenmerken en begeleidingsstrategieën.

De analyse van de studentkenmerken liet zien dat begeleiders vooral kijken naar verschillende competentieaspecten van studenten, naar hun studiehouding en vastberadenheid, en naar hun persoonlijke situatie. In aanvulling daarop liet de analyse van de begeleidingsstrategieën zien dat begeleiders hun begeleiding aanpassen aan de student in termen van het expliciteren van standaarden, kwaliteit van een tussenproduct en/of de gevolgen van studentgedrag, de verdeling van de verantwoordelijkheden, het geven van meer of minder kritische feedback en het inleven in en meevoelen met de student. De relatie tussen de studentkenmerken en begeleidingsstrategieën werd geïllustreerd aan de hand van een aantal stereotypen en bleek behoorlijk complex te zijn. Dat wil zeggen dat geen eenduidige een-op-een verbanden gevonden werden voor studentkenmerken en begeleidingsstrategieën, maar dat sets van kenmerken verband houden met sets van begeleidingsstrategieën. Die verbanden zouden per begeleider ook best nog eens kunnen verschillen. Vervolgonderzoek hiernaar werd dan ook aanbevolen.

Tenslotte werd in **Hoofdstuk 8** de overkoepelende onderzoeksvraag beantwoord en werden de bijdragen van het proefschrift aan verschillende wetenschappelijke debatten en theorieën bediscussieerd. De conclusie was dat kwaliteit van begeleiding, gezien vanuit studenttevredenheid en de bijdrage van de begeleider aan het leren volgens de studenten, inhoudt dat de feedback in de ogen van studenten doelgericht is, gefocust op de taak en positief onderbouwd en dat de relatie met de begeleider getypeerd kan worden als vriendelijk, helpend en leidend. Daarbij geldt dat juist wanneer

de relatie niet optimaal is, de beleving van de feedback belangrijker wordt voor de kwaliteit van de begeleiding. Bezien vanuit het perspectief van begeleiders (met een goede reputatie als begeleider binnen hun werkcontext), betekent kwaliteit van begeleiding dat de begeleiding adaptief is en dus dat een begeleider let op bepaalde kenmerken van studenten, in het licht van de doelen, en zijn of haar begeleidingsstrategieën hierop aanpast.

Verder werd de introductie en verkenning van het concept adaptiviteit beschreven als de belangrijkste wetenschappelijke bijdrage van dit proefschrift. Immers, de context van masterthesisprojecten heeft een aantal kenmerken die maken dat deze zich bij uitstek leent voor het geven van adaptieve begeleiding, zoals de langere duur en de een-op-een interactie. Dit biedt de begeleider de mogelijkheid om de student te leren kennen en te ontdekken wat hij of zij nodig heeft. Daarnaast wordt aangevoerd dat een behoorlijk aantal andere onderzoeken ook al impliciet wijzen op het belang van een adaptieve aanpak van begeleiding van onderzoek. Dit betekent dat adaptieve begeleiding niet specifiek lijkt te zijn voor de begeleiders die aan dit onderzoek mee hebben gedaan. Dat impliceert dat de bevindingen van waarde en wellicht van toepassing zijn voor iedereen die bij de masterthesisbegeleiding betrokken is. Een andere wetenschappelijke bijdrage van dit proefschrift is de combinatie van de twee perspectieven: het cognitieve en het sociaal-emotionele, toegespitst op feedback en de student-begeleider relatie. Op basis van de gevonden interactie-effecten wordt gesuggereerd dat om de kwaliteit van masterthesisbegeleiding echt goed te verklaren alleen een feedback of interpersoonlijk perspectief niet volstaat en dat feedback op een masterthesis altijd in de context van de begeleider-student relatie onderzocht zou moeten worden. Daarnaast zijn de wetenschappelijke bijdragen met betrekking tot de conceptualisatie van kwaliteit van begeleiding, feedbackonderzoek en interpersoonlijke relaties in het onderwijs uitgewerkt.

De belangrijkste beperkingen van het onderzoek zijn geweest dat slechts een beperkt aantal kenmerken van de inhoud van feedback is meegenomen, dat invloed en nabijheid als onafhankelijke dimensies zijn onderzocht, dat vrij subjectieve maten voor kwaliteit zijn gebruikt, dat percepties en doelen slechts eenmalig zijn gemeten, dat veelvuldig gebruik gemaakt is van zelfrapportage en dat het aantal respondenten bij de kwalitatieve studies, weliswaar bewust, beperkt was. In aansluiting daarop zou vervolgonderzoek met longitudinale studies en observatiestudies relevant zijn, evenals onderzoek dat een verdere verdieping biedt in inzichten hoe begeleiders adaptieve begeleiding vorm kunnen geven.

Tenslotte werd de opbrengst van dit proefschrift voor de praktijk van de begeleiding van mastertheses beschreven. Voor begeleiders lijkt het van belang om zich te verdiepen in de studenten om vervolgens de begeleiding op de student aan te passen om de student op die manier te ondersteunen in het behalen van in elk geval de curriculaire doelen. Daarbij is het van belang dat begeleiders zich opstellen als vriendelijk, leidend en helpend om zo een goede relatie met de student op te bouwen. Daarnaast is het ook wezenlijk om naast negatieve feedback, ook specifieke positief onderbouwde feedback te geven, zodat studenten dat wat zij al goed kunnen ook blijven doen (bijvoorbeeld het onderbouwen van keuzes). Op het niveau van instellingen voor hoger onderwijs werden implicaties beschreven in termen van het creëren van mogelijkheden voor het professionaliseren van begeleiders. Daarbij zou gebruik gemaakt kunnen worden van groepsbijeenkomsten waarin begeleiders ervaringen en moeilijkheden uitwisselen. Ook het bijhouden

van korte logboekjes over specifieke studenten verdient aanbeveling. Bij dit soort professionaliseringstrajecten lijkt het van belang om ook het onderwerp adaptiviteit op de agenda te zetten om begeleiders op die manier bewust te maken van de mogelijkheid om hun begeleiding te differentiëren per student afhankelijk van wat een student nodig heeft. Ook werd benadrukt dat het van belang is - om begeleiders in de gelegenheid te (blijven) stellen om adaptieve begeleiding te geven - dat er voldoende uren beschikbaar blijven voor de begeleiding van de masterthesis. Immers, deze tijd is nodig om de student te leren kennen en het cyclische karakter van de begeleidingsgesprekken te kunnen benutten. Als laatste werd aan studenten onder andere geadviseerd om zich bereidwillig op te stellen in het delen van hoe zij in hun masterthesisproject staan en wat ze kunnen, zodat de begeleider ook daadwerkelijk in staat gesteld wordt om adaptieve begeleiding te geven.

Publications

Peer-reviewed publications

- Kleijn, R.A.M de, Mainhard, M.T., Meijer, P.C., Pilot, A., & Brekelmans, M. (2012). Master's thesis supervision: Relations between perceptions of the supervisor–student relationship, final grade, perceived supervisor contribution to learning and student satisfaction. *Studies in Higher Education*, 37(8), 925-939. DOI:10.1080/03075079.2011.556717
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- Kleijn, R.A.M de, Meijer, P.C., Brekelmans, M., & Pilot, A. (2013). Curricular goals and personal goals in master's thesis projects: Dutch student-supervisor dyads. *International Journal of Higher Education*. DOI: 10.5430/ijhe.v2n1p1

Papers in progress

- Bouwmeester, R.A.M., de Kleijn, R.A.M., Freriksen, A.W.M., van Emst, M.G., Veeneklaas, R., van Hoeij, M.J.W., Spinder, M., Ritzen, M.J., ten Cate, O., & van Rijen, H. (submitted). Online formative tests linked to microlectures improve academic achievement.
- Kleijn, R.A.M. de, Bouwmeester, R.A.M., Ritzen, M.J., Ramaekers, S.P.J., & van Rijen, H. (submitted). Students' motives for using online formative assessments when preparing for summative assessments
- Kleijn, R.A.M. de, Meijer, P.C., Pilot, A., & Brekelmans, M. (submitted). The relation between feedback perceptions and the supervisor-student relationship in master's thesis projects.
- Kleijn, R.A.M. de, Meijer, P.C., Meijer, Pilot, A., & Brekelmans, M. (submitted). The relation between feedback perceptions and the supervisor–student relationship in master's thesis projects.
- Kleijn, R.A.M. de, Bronkhorst, L.H., Meijer, P.C., Pilot, A., & Brekelmans, M. (submitted). Establishing goal-relatedness in master's thesis supervision: adaptivity.
- Kleijn, R.A.M. de, Meijer, P.C., Brekelmans, M., & Pilot, A. (submitted). Adaptive research supervision: exploring expert thesis supervisors' practical knowledge.

Conference papers

- Kleijn, R.A.M. de, Mainhard, M.T., Meijer, P.C., Pilot, A., & Brekelmans, M. (2010). Student perceptions of content and form of feedback in master's thesis supervision. Paper presented at the American Educational Research Association (AERA), Denver, USA.
- Kleijn, R.A.M. de, Mainhard, M.T., Meijer, P.C., Pilot, A., & Brekelmans, M. (2010). Master's thesis supervision: Perceptions of the supervisor-student relationship. Paper presented at the International Conference on Interpersonal Relationships in Education (ICIRE), Boulder, USA.
- Kleijn, R.A.M. de, Meijer, P.C., Brekelmans, M., & Pilot, A. (2010). Goals in master's thesis supervision: Student and supervisor perspectives. Paper presented at the ICO Toogdag, Amsterdam, the Netherlands.
- Kleijn, R.A.M. de, Meijer, P.C., Pilot, A., & Brekelmans, M. (2011). Goal communication in master's thesis supervision. Paper presented at International Study Association on Teachers and Teaching (ISATT), Braga, Portugal.
- Kleijn, R.A.M. de, Meijer, P.C., Pilot, A., & Brekelmans, M. (2011). Aandacht voor de student in master's thesis begeleiding. Paper presented at the Onderwijs Research Dagen (ORD), Maastricht, the Netherlands.

Publications

- Kleijn, R.A.M. de, Meijer, P.C., Pilot, A., & Brekelmans, M. (2012). Interpersonal and feedback perceptions in master's thesis supervision. Paper presented in the symposium 'Teacher and student roles during feedback in interaction' at the SIG 1 meeting of the European Association of Research on Learning and Instruction (EARLI), Brussels, Belgium.
- Kleijn, R.A.M. de, Meijer, P.C., Pilot, A., & Brekelmans, M. (2012). Interpersonal supervisor-student relationship and feedback perceptions. Paper presented at the International Conference on Interpersonal Relationships in Education (ICIRE), Vancouver, Canada.
- Kleijn, R.A.M. de, Meijer, P.C., Pilot, A., & Brekelmans, M. (2012). Master's thesis begeleiding: Interpersoonlijke en feedback percepties. Paper presented in the symposium 'De rol van docenten en studenten tijdens feedback in interactie' at the Onderwijs Research Dagen (ORD), Wageningen, the Netherlands.
- Kleijn, R.A.M. de, Meijer, P.C., Brekelmans, M., & Pilot, A. (2013). Verkenning van contingente scriptiebegeleiding: Diagnose en support. Paper presented at the Onderwijs Research Dagen (ORD), Brussels, Belgium.
- Haan, P.R.E. de, & de Kleijn, R.A.M. (2013). Feedback en emoties in loopbaanbegeleidingsgesprekken. Paper presented at the Onderwijs Research Dagen (ORD), Brussels, Belgium.
- Prins, F.J., de Kleijn, R.A.M., & van Tartwijk, J.F. (2013). Formatief gebruik van rubrics voor onderzoeksartikelen. Paper presented at the Onderwijs Research Dagen (ORD), Brussels, Belgium.
- Kleijn, R.A.M. de, & Bronkhorst, L.H. (2013). PhD Students becoming educational design researchers: Challenges and learning outcomes. Paper presented at the annual Junior Research of EARLI conference (JURE), München, Germany.
- Prins, F.J., de Kleijn, R.A.M., & van Tartwijk, J.F. (2013). Students' use of a rubric for research papers. Paper presented in the symposium 'Using rubrics for formative purposes: mapping the process' at the biannual meeting of the European Association of Research on Learning and Instruction (EARLI), München, Germany.

Conference round table and poster presentations

- Kleijn, R.A.M. de (2009). Supervisor-student relationship and feedback in master's thesis supervision. Round table presented at the JURE, Amsterdam, the Netherlands.
- Kleijn, R.A.M. de, Mainhard, T., Brekelmans, M., Meijer, P.C., & Pilot, A. (2009). Master's thesis begeleiding: percepties van feedback en interpersoonlijk gedrag. Poster presented at the Educational Research Days (ORD), Leuven, Belgium.
- Kleijn, R.A.M. de, Meijer, P.C., Brekelmans, M., & Pilot, A. (2010). Interpersonal relationships and feedback in master's thesis supervision. Round table presented at the International Conference on Interpersonal Relationships in Education (ICIRE), Boulder, USA.
- Kleijn, R.A.M. de, Meijer, P.C., Pilot, A., & Brekelmans, M. (2010). Feedback in master's thesis supervision. Poster presented at the JURE, Frankfurt, Germany.
- Kleijn, R.A.M. de, Mainhard, M.T., Meijer, P.C., Brekelmans, M., & Pilot, A. (2010). Het effect van studentbeelden van de begeleider-studentrelatie op de effectiviteit van onderzoeksbegeleiding in de context van academische master's thesis begeleiding. Poster presented at the Educational Research Days (ORD), Enschede, the Netherlands.

Other publications

- Kleijn, R. A. M. de (2008). Is vernieuwing verbetering? Eindexamen muziek oude stijl en CKV3-muziek, ervaringen op drie scholen. *Kunstzone*,7(5).
- Kleijn, R. A. M. de (2008). Het toetsen van muzikale vaardigheden. *Kunstzone*,7(9).

Curriculum Vitae

Renske de Kleijn werd geboren op 12 juni 1986 in Nijmegen. In 2004 behaalde zij haar gymnasiumdiploma op het Titus Brandsma Lyceum te Oss, waarna zij aan de Universiteit Utrecht startte met de opleiding Muziekwetenschap. Vanaf 2005 volgde zij daarnaast de verkorte bachelor van de opleiding Onderwijskunde aan de Universiteit Utrecht. De studie Muziekwetenschap rondde zij in 2007 af met een thesis over het schoolvak Muziek in de bovenbouw van havo en vwo, onder begeleiding van dr. Frits Evelein. In datzelfde jaar sloot ze de verkorte bachelor Onderwijskunde af met een thesis onder begeleiding van dr. Frans Prins en in samenwerking met Rianne Poot. Deze thesis had betrekking op de rol van kinderen met het syndroom van Down in reguliere basisschoolklassen. Vervolgens voltooide ze in 2009 de research master 'Learning in Interaction' onder begeleiding van dr. Tim Mainhard en prof. dr. Mieke Brekelmans.

Parallel aan haar tweede masterjaar begon Renske in 2008 aan haar promotieonderzoek naar masterthesis begeleiding onder begeleiding van prof. dr. Albert Pilot, dr. Paulien Meijer en na afronding van haar master ook prof. dr. Mieke Brekelmans bij het toenmalige IVLOS. Tijdens haar onderzoek volgde ze verschillende cursussen van onderzoeksschool ICO (bijv. Educational design research en Assessment for future learning and research) en presenteerde ze haar onderzoek op verschillende nationale en internationale congressen (bijv. ORD, EARLI en AERA). Ook verzorgde ze verschillende workshops met betrekking tot onderzoeksvaardigheden en statistiek binnen de lerarenopleiding van de Universiteit Utrecht en begeleidde ze masterstudenten Onderwijskunde bij hun masterthesis.

In 2010 startte Renske als onderwijskundig adviseur bij team Onderwijsontwikkeling onder leiding van dr. Ineke Lam bij het IVLOS. Toen dat instituut na reorganisatie opging in het Centrum voor Onderwijs en Leren, continueerde zij haar werkzaamheden als adviseur bij het domein Toetsing en Feedback onder leiding van dr. Stephan Ramaekers. Sinds de afronding van dit proefschrift heeft zij haar advieswerk uitgebreid en werkt Renske bovendien als post-doc onderzoeker aan een door NWO gesubsidieerde reviewstudie met betrekking tot de relatie tussen toetsing en motivatie, in samenwerking met dr. Frans Prins en prof. dr. Jan van Tartwijk. Ook is zij inhoudelijk projectleider van een door OC&W gesubsidieerd project dat zich toelegt op datagebruik in het Utrechtse voortgezet onderwijs en werkt zij mee aan verschillende interne projecten van de Universiteit Utrecht.

Naast haar werkzaamheden aan de Universiteit Utrecht dirigeert ze sinds 2005 vol enthousiasme kinderkoor de Flierefluiter uit Herpen en sinds 2011 kinderpopkoor No Kidding uit Schijndel.

List of ICO-Dissertations 2012

236. Gervedink Nijhuis, C.J. (03-2-2012) *Culturally Sensitive Curriculum Development in International Cooperation* Enschede: University of Twente
237. Thoonen, E.E.J. (14-02-2012) *Improving Classroom Practices: The impact of Leadership School Organizational Conditions, and Teacher Factors* Amsterdam: University of Amsterdam
238. Truijen, K.J.P (21-03-2012) *Teaming Teachers. Exploring factors that influence effective team functioning in a vocational education context* Enschede: University of Twente
239. Maulana, R.M. (26-03-2012) *Teacher-student relationships during the first year of secondary education. Exploring of change and link with motivation outcomes in The Netherlands and Indonesia.* Groningen: University of Groningen
240. Mulder, Y.G. (19-04-2012) *Learning science by creating models* Enschede: University of Twente
241. Van Zundert, M.J. (04-05-2012) *Optimising the effectiveness and reliability of reciprocal peer assessment in secondary education* Maastricht: Maastricht University
242. Ketelaar, E. (24-05-2012) *Teachers and innovations: on the role of ownership, sense-making, and agency.* Eindhoven: Eindhoven University of Technology
243. Logtenberg, A. (30-5-2012) *Questioning the past. Student questioning and historical reasoning* Amsterdam: University of Amsterdam
244. Leppink, J. (20-06-2012) *Propositional manipulation for conceptual understanding of statistics* Maastricht: Maastricht University
245. Van Anel, J (22-06-2012) *Demand-driven Education. An Educational-sociological Investigation.* Amsterdam: VU University Amsterdam
246. Spanjers, I.A.E. (05-07-2012) *Segmentation of Animations: Explaining the Effects on the Learning Process and Learning Outcomes.* Maastricht: Maastricht University
247. Vrijnsen-de Corte, M.C.W. *Researching the Teacher-Researcher. Practice-based research in Dutch Professional Development Schools* Eindhoven: Eindhoven University of Technology
248. Van de Pol, J.E. (28-09-2012) *Scaffolding in teacher-student interaction. Exploring, measuring promoting and evaluating scaffolding* Amsterdam: University of Amsterdam
249. Phielix, C. (28-09-2012) *Enhancing Collaboration through Assessment & Reflection [Samenwerking Verbeteren door middel van Beoordeling en Reflectie]* Utrecht: Utrecht University
250. Peltenburg, M.C. (24-10-2012) *Mathematical potential of special education students* Utrecht: Utrecht University
251. Doppenberg, J.J. (24-10-2012) *Collaborative teacher learning: settings, foci and powerful moments* Eindhoven: Eindhoven University of Technology
252. Kenbeek, W.K. (31-10-2012) *Back to the drawing board. Creating drawing or text summaries in support of System Dynamics modeling* Enschede: University of Twente
253. De Feijter, J.M. (09-11-2012) *Learning from error to improve patient safety* Maastricht: Maastricht University
254. Timmermans, A.C. (27-11-2012) *Value added in educational accountability: Possible, fair and useful?* Groningen: University of Groningen
255. Van der Linden, P.W.J. (20-12-2012) *A design-based approach to introducing student teachers in conducting and using research.* Eindhoven: Eindhoven University of Technology.