

## MASTER

### Team goal setting in new product development teams empirical field study of team goal characteristics

van Elst, K.J.A.

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Eindhoven, October 2009

**Team goal setting in new product  
development teams:  
Empirical field study of team goal  
characteristics**

by  
K.J.A. van Elst

BSc Industrial Engineering and Management Science  
Student identity number 0470979

in partial fulfilment of the requirements for the degree of

**Master of Science  
in Innovation Management**

Supervisors:  
dr. T.Bipp, TU/e, HPM  
dr.ir. P.A.M. Kleingeld, TU/e, HPM

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"If you don't know where you are going, you will probably end up somewhere else."

~Lawrence J. Peter (1919 – 1990)

## **Abstract**

This report contains the findings of a field study conducted in the area of new product and process development. The main topic of the study is enclosed within the field of organizational psychology and innovation science. This study investigated the field of innovation teams in order to gain insight in the link between goal setting theory and innovation performance enhancement. Data on 24 teams revealed that organizational facilitation of goal attainment was positively related to team reflexivity and team goal conflict has negative effects on team reflexivity. Other hypotheses regarding team reflexivity and hypotheses regarding risk taking could not be supported. Based on these results, practical implications are provided.

## Preface

Having nearly finished my graduation project of the Master Innovation Management, I would like to use this opportunity to express my gratitude to all persons who have assisted the completion of my project. Without them, I would not have been able to make my graduation project to a success.

First of all, I would like to thank Dr. Tanja Bipp for her advice and effort during the to assistance of my project. She assisted the several stages that lead to this project and always reminded me important deadlines, which sometimes were lost track of. Time after time, her enthusiasm and cheerfulness were a source of inspiration for me. Furthermore, her accurate and precise feedback during the project always served as moments of learning. Her extensive knowledge of the field and her knowledge regarding measurement and analysis issues were a sine qua non.

Secondly, I would thank Dr. Ad Kleingeld to assist in the project as second supervisor. His knowledge regarding goal setting theory was essential as well. His sharp eye regarding the research method, analysis and formulations were necessary in order to deliver a well executed and well documented project.

Thirdly, I would like to thank Drs. K. Noy, Drs. A. van de Lockant and KIVI-NIRIA, the professional association of engineers in The Netherlands for their assistance in finding suitable respondents for the research sample. Without the respondents, this project could not have been taken place indeed.

Finally, I would express my appreciation towards my wife and family who have supported me during my study in Eindhoven. Lastly, I would like to thank all lecturers and staff of the TU Eindhoven. Without them, I was not able to grow intellectually towards I have achieved.

K.J.A. van Elst B.Sc.

October, 2009

<b>Abstract</b> .....	4
<b>Preface</b> .....	5
<b>Summary</b> .....	7
<b>1. Introduction</b> .....	10
<b>2. Literature and hypothesis development</b> .....	15
2.1 NPD teams .....	15
2.2 Goal setting theory .....	17
2.3 Team goal setting in NPD teams .....	19
2.4 Hypothesis development .....	22
<b>3. Research method</b> .....	33
3.1 Participants .....	33
3.2 Procedure .....	33
3.3 Measures .....	34
3.3.1 Independent variables .....	34
3.3.2. Dependent variables .....	36
3.3.3. Mediating variables .....	37
3.3.4. Control variables .....	38
3.3.5. Background variables .....	39
<b>4. Data analysis and results</b> .....	41
4.1 Background data .....	41
4.1.1 Individual background data .....	41
4.1.2. Team background data .....	42
4.1.3. Organizational background data .....	43
4.2 Descriptive statistics .....	43
4.3 Data aggregation .....	44
4.4 Hypotheses testing .....	47
4.4.1. Team reflexivity .....	47
4.4.2. Risk taking .....	51
4.5 Overview of the results .....	53
<b>5. Discussion</b> .....	54
5.1 Main findings .....	54
5.2 Practical implications / recommendations .....	56
5.3 Theoretical implications .....	58
5.4 Research limitations .....	59
5.5 Future research directions .....	61
5.6 Discussion research questions .....	61
<b>References</b> .....	63
<b>Appendix A: Questionnaire</b> .....	70
<b>Appendix B Differences between team categories</b> .....	79
<b>Appendix C: Testing the influence of control variables on team reflexivity</b> .....	81
<b>Appendix D: Regression results for predicting team reflexivity</b> .....	82
<b>Appendix E: Mediation analysis team reflexivity</b> .....	83
<b>Appendix F: Mediation analysis organizational facilitation of goal attainment</b> .....	84
<b>Appendix G: Testing the influence of control variables on risk taking</b> .....	85
<b>Appendix I: Correlation table of measures at the individual level</b> .....	87

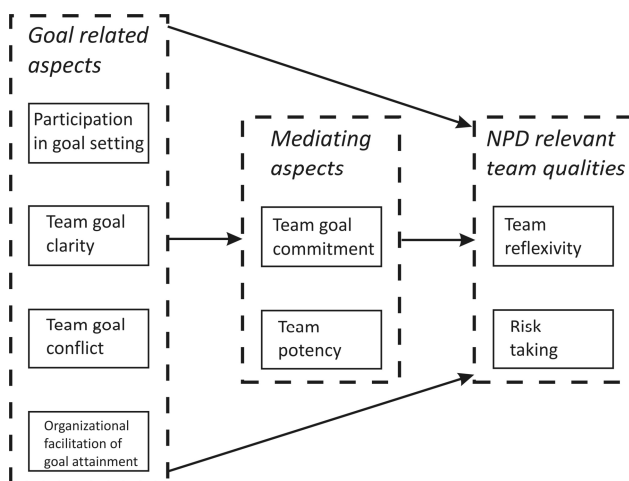
## Summary

The study that is reported here, investigates the function of team goal characteristics and new product development (NPD) team relevant qualities from an organization-psychological viewpoint. The growing importance of NPD for firm-survival and the increased use of the team as an organizational vehicle, makes performance enhancement at the level of the team increasingly important. The point of departure, therefore, is a study that investigates the role of team goals in NPD teams.

The study can be considered as a scientific project attempting to describe a model which is aimed to be applicable in practice. The resulting model is used as a point of departure to provide practical implications. Through research objectives and research questions, concrete direction is provided in order to make this project focused and result oriented without losing the arts of science.

The motivation to choose this topic is the relative ignorance of goal setting theory as a valuable theory that may be used for the enhancement of performance of innovation teams. Goal setting, indeed, was known for its positive effects on team performance in more straightforward team tasks. Though there are few studies that have studied the role of team goals in NPD teams, this study, attempted to provide more evidence that team goal setting is applicable to highly complex teams.

**Figure A Research model**



The extension on the existing studies meant the inclusion of the following aspects in this study. First of all, the focus of the investigation was on finding relations between two categories of variables (see Figure A for the underlying research model in this study). The first category contains (four) team goal aspects, (1) organizational facilitation of goal attainment, (2) participation in goal setting, (3) team goal clarity, and (4) team goal conflict. The second category contains (two) team qualities that, based on prior research, are important for the performance of NPD teams. The two NPD relevant team



qualities are team reflexivity and team risk taking. Furthermore, the study investigated whether team goal commitment and team potency would function as mediating variables between the two categories. Figure A depicts the underlying research model of this report.

Since the study is interested in the team level of analysis, the variables of interest had to be measured at the team level (due to the fact that objective measures are often hard to acquire, subject measures, by using questionnaires, were used in this study). First, the variables (constructs) measure individual perceptions of the phenomena by using sound scales from prior research and later three or more filled out questionnaires per team were used for aggregation to the team level. By this aggregation process (averaging the scores of each variable over each team member in the group) the study could investigate team level constructs. The items of each scale were inserted in one questionnaire that was distributed to respondents that were available and were found suitable for this study. The requirement for participation were that each respondent must have taken part in an innovative development project in a team. Furthermore, at least two other team members must be willing to fill out the questionnaire as well. After collecting the data (filled out questionnaires), these data was entered into a statistical computer application (SPSS 17.0) and the proposed hypotheses could be tested using multiple linear regression.

The regression models revealed that two hypotheses were accepted: (1) team goal conflict negatively predicted team reflexivity, and (2) organizational facilitation of goal attainment predicted team reflexivity positively. One hypothesis provided a clue that a trend in the data was found: although the measured effect was not significant and the sign of the relation seemed to negative, the effect of the predictor was almost significant (the significance level for this effect was between .05 and .10). This meant that there was a clue that organizational facilitation of goal attainment may be negatively related to team risk taking. The mediating variables, team goal commitment and team potency, seemed not to play a role in the proposed models.

Despite the preparation of this study, limitations of this study are present as well. First, the sample size ( $N = 24$ ) approaches the lower bound for executing a regression analysis in this study. The results can only speak for the teams that participated in the study. Therefore, generalization to other NPD teams is not possible. However, if teams seem to be similar to the teams used in this study, the findings may be relevant for them. Other limitations were non-response bias, use of teams with and without team members, and common method problems.

The results of the study can be used for providing practical implications to the field of NPD teams. First, team goal conflicts need to be minimized in order to improve the reflexivity of teams. Goal conflicts may be minimized by introducing cooperative goals (common goals for

each team member). Secondly, organizational facilitation of goal attainment in NPD teams can be achieved by measuring and improving five important aspects of a sound innovative climate within the organization: organizational encouragement, supervisory encouragement, work group supports, challenging work, and diminishing organizational impediments.

## 1. Introduction

New product development (NPD) is of great importance to businesses which are aiming at top positions in their market (Gloet and Terziovski, 2004; Mohr, Sengupta, and Slater, 2005). One reason for the importance of NPD is a rapid development of new technologies and therefore a faster obsolescence of existing technologies. Secondly, volatile needs of customer obsolete an organization's product portfolio as well since today's products are useless tomorrow. This all makes NPD a major contributor for winning today's battle in the field of market share, profits, and thus, survival.

In the literature, NPD and innovation are terms which are often used interchangeably. Innovation refers to a "successful implementation of creative ideas within an organization" (Amabile, Conti, Coon, Lazenby, and Herron, 1996, p. 1155), whereas the term NPD is used to refer to the *process* of bringing a new product, process, or service to the market. In sum, NPD is strongly related to innovation.

But what exactly is the role of teams in innovation? This seems to be a straightforward answer. Innovating companies often depend on NPD teams (rather than an individual) in order to develop new products and/or services (Clark and Fujimoto, 1991; Ancona and Caldwell, 1992; Brown and Eisenhardt, 1995; Hoegl, Weinkauff, and Gemuenden, 2004). The reason for this seems to be straightforward as well. To cope with today's complex products, organizations split their products in different parts, sometimes called modules (Ulrich and Eppinger, 2000). Each module, then, needs specialists since each module is strongly demarcated by a specialized field of knowledge. Think of a new generation plasma televisions to be developed. This artefact consists of several modules like a screen, plastic covering, chipsets, software, etc. Knowledge regarding the plastic covering, for example, is coming from chemical engineers, process engineers and maybe others. Conversely, the software engineers do not need knowledge about chemicals or production processes. They mainly need to know how software has to be built that directs the future user to his or her television channel of interest. Off course, all specialists need to cooperate to make a future product a success (indeed, the modules have to interact with each other) but in essence, each specialisation has its own specialist(s). The reason, thus, for developing new products in a team is that all specialized knowledge, in all likelihood, cannot come from a single person.

The broad topic of factors improving NPD team performance has gained increasing interest from scholars last two decades (Ancona and Caldwell, 1992; Lovelace, Shapiro, and Weingart, 2001). Within this field, psychological factors influencing NPD team performance have been started to be studied recently. Examples of psychological factors which were topic of investigation in the field of NPD team performance are: improvisation and unlearning (Akgün, Byrne, Lynn, and Heskin, 2007), reward structures (Sarin and Mahajan, 2001; Chang, Yeh, and Yeh, 2007), upper-management control

(Bonner, Ruekert, and Walker, 2002), team potency (Howell and Shea, 2006), personality (Reilly, Lynn, and Aronson, 2002), team behavior of cooperation (McDonoughIII, 2000), and the setting of goals (Hoegl and Parboteeah, 2003; Kuester, Schuhmacher, Lenz, and Mantel, 2008). Elaborating on the last mentioned category, this study investigates the role team goal characteristics<sup>1</sup> play in NPD teams. Particularly, this study is interested in the role of team goals (team goal characteristics) and two NPD team behaviors: team reflexivity<sup>2</sup> and team risk taking. Hence, practical implications of the research results will be proposed in order to provide relevant information for practitioners in the field.

### *Research objective*

To gain insight in the role of goals in NPD teams, this paper investigates the combination of team goal characteristics and NPD team behaviors through a questionnaire study conducted in the field. However, this study will not suffice by a mere description of the relation of the team goal characteristics under investigation. Practical implications in the form of concrete recommendations are therefore provided as well. Therefore, a second (sub)goal is to contribute to the relevance of the field of NPD teams by providing practical implications/recommendations to the field of NPD teams (based on the analyses in this study).

The aim of the present Master's Thesis project, which is twofold, is:

- (1) Describe the relation between team goal characteristics and two team behaviors, (a) team reflexivity and (b) team risk taking. Investigate the NPD team goal characteristics which have a potential contribution to (a) team reflexivity, and (b) risk taking. Furthermore, investigate the mechanisms (mediators) between team goal characteristics and team reflexivity and team risk taking.
- (2) Provide practical implications for the implementation of NPD team goal characteristics based on the obtained models.

The first research objective will be achieved by finding answers to the following research questions:

- Which team goal characteristics tend to contribute to the reflexivity in NPD teams?
- Which team goal characteristics tend to contribute to risk taking in NPD teams?
- Which team goal characteristic – team reflexivity relationship is partially mediated by team goal commitment?
- Which team goal characteristic – team risk taking relationship is partially mediated by team potency?

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<sup>1</sup> Team goal characteristics are defined in chapter 2

<sup>2</sup> Team reflexivity is defined in chapter 2

The answers on the research questions, however, will not be used for the achievement of the second research objective. This is done by translating the general answers on the research questions to a concrete interpretation of the answers.

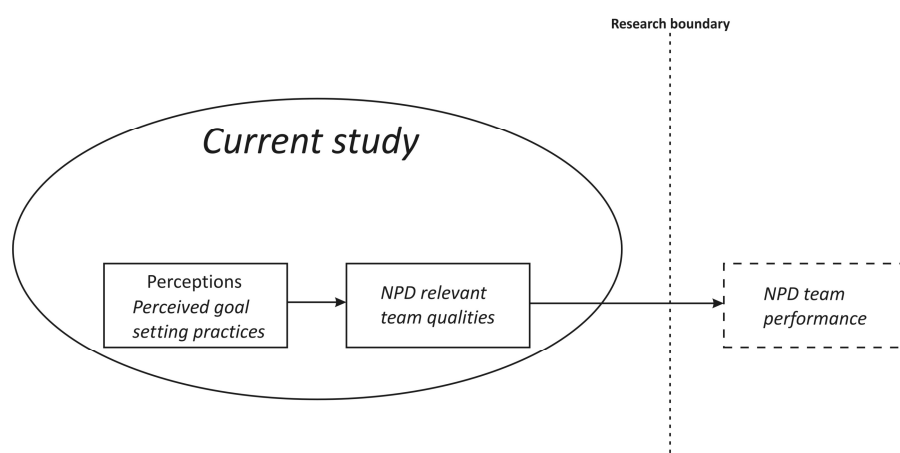
Therefore, we first study the importance of two NPD team processes for (NPD) team performance. Subsequently, we look for plausible connections of these processes to team goal related factors and propose our hypotheses under investigation which leads to a conceptual model.

#### *Delineation and context*

This study will be conducted in the field of NPD teams by using a sample of NPD teams from the field. The variables of interest are on the one hand related to (team) goal theory (Locke and Latham, 1990), and on the other hand NPD relevant team qualities. The choice of variables will be outlined in chapter 2.

Because the object of study is the NPD team, the level of analysis is the team (not the individual). In the next chapter, more will be explained about the importance of the team qualities. Therefore, the study is focused on goal mechanisms within NPD teams.

Regarding the delineation of the current study, an important consideration is the research scope. The visualisation of that delineation is depicted in Figure 1 though. As can be seen in the most left box in Figure 1, this study concerns subjective measures of goal setting practices in teams instead of objective measures of goal setting practices. The first reason for the choice to study subjective measures is that it is difficult to find objective measures of goal setting practices. Due to a high extent of confidentiality within NPD projects, access to project documents is often not possible. Secondly, subjective measures may provide a more balanced view of the actual goal setting practices and not a mere picture whether the organization uses goals or not to enhance performance. Indeed, due to goal setting programs' widespread use nowadays, it is difficult to find organizations who would claim that goal setting principles are not applied within their organization. This widespread use, however, does not guarantee that the implementation or application of goal setting is done executed rightly (Hertel, Konradt, and Orlikowski, 2004). In reality, NPD project/team leaders may, for example, have neglected some important features of goal setting such as goal clarity. Alternatively, NPD team leaders may not be trained well to execute a goal setting programme, which may tackle the benefits of goal setting practices (Hertel et al., 2004). Thus, it may be more reliable to measure the extent to which goal setting is practiced in NPD teams instead of relying on objective measures of the use of goals. That is, we suggest that perceptions of team goal setting practices make more sense, though these measures may be biased.

**Figure 1 Visualization of the delineation of the current study**

In Figure 1, a second block can be seen. This block, which is named ‘NPD relevant team qualities’, refers to a category which organization scientists have provided evidence to be beneficial for NPD team performance. In this study, two NPD relevant team qualities will be investigated. These qualities are team reflexivity and risk taking. A more detailed description of these qualities as well as the relation with NPD team performance will be outlined hereafter.

The main reason for the connection of the two blocks in this study is the lack of insight in the mechanisms between goal setting practices and NPD relevant team qualities in the field (and particularly in NPD teams). That is, scientists have already given attention to variables of goal setting and behavioral qualities, but these relations have been tested either in experimental settings only or have not been tested in NPD teams. Knight, Durham, and Locke (2001), for example, have provided evidence for a positive relation between team goals and risk taking behavior in an experiment (see chapter 2 for details). Regarding team reflexivity, Carter and West (1998) have already tested team goal qualities (team goal clarity) and reflexivity within teams, but the teams consisted of BBC-TV production teams. In order to study the practical significance of the aforementioned relations within NPD teams, replications of those research results in NPD field settings will be executed.

The last choice regarding the delineation of the study scope is the choice for drawing the line between the to be studied blocks and objective team performance. As it can be seen in Figure 1, the relationships under investigation are deliberately not focused on describing, explaining, and/or predicting team performance. The main reason is that research results suggest that team performance has already been affected by team reflexivity (De Dreu, 2002; Schippers, Den Hartog, Koopman, and Wienk, 2003; West, 1996) and risk taking (Knight et al., 2001). In sum, both risk taking (Ernst, 2002)

and reflexivity seem to have an effect on NPD teams, which has already been studied. A second reason is that objective performance measures are often hard to acquire due to company policies (Hertel et al., 2004). In sum, objective team performance is excluded in this study and with this the delineation has been sufficiently explained.

### *Structure*

The last part of this introductory chapter is the clarification of the structure of the remainder of this report. Chapter 2 starts with a review of the literature concerning team goal setting in combination with literature about NPD teams. First, a general introduction is given that discusses NPD teams. Subsequently, the theoretical background and the development of the hypotheses are explained in chapter 2. Next, chapter 3 discusses the research method and chapter 4 will explain that data analysis and results. Lastly, chapter 5 will outline the discussion.

## 2. Literature and hypothesis development

### 2.1 NPD teams

As stated in the general introduction of this report, NPD projects take place in a team context mostly (Ancona and Caldwell, 1992; Hoegl et al., 2004). A major reason for the choice for teams is that teams have several advantages over individuals (Scholtes, Joiner, and Streibel, 1996). In the following situations, it is argued that teams outperform individuals:

- (1) the task is complex
- (2) creativity is needed
- (3) there is no clear path
- (4) resource usage needs to be more efficient
- (5) fast learning is necessary
- (6) high commitment is desired
- (7) cooperation of others to implement a plan is necessary
- (8) the entire task is a cross-functional task.

Since NPD team activities are reflected in most, if not all, of these situations, teams are increasingly used by innovative organizations. Therefore, teams are more appropriate for NPD projects than individuals and this is supported by observations in the field (Ancona and Caldwell, 1992).

The usefulness of teams within organizations has become clear and it remains to provide a definition of teams. Since there is not one common definition of a team and there numerous variants (see for example Salas, Dickinson, Converse, and Tannenbaum, 1992 ; or Salas, Goodwin, and Shawn Burke, 2008), a certain choice for a definition was to be made based on a subjective trade off. However, with the definition used in this report, it is tried to remain clear *and* to ensure one appropriate definition is given. Appropriateness for the definition used here is likely to be good since most definitions of work teams, which have been inspected, contain similar characteristics but different words (thus, overlapping each other). Thus, the choice for the definition of teams in this report does not mean that alternative definitions, not mentioned here, are inappropriate or incomplete.

The definition of a team which has been adopted here, contains characteristics (of teams) which are used in most other definitions of what a team is. The choice made here fell on the definition provided by Hoegl and Gemuenden (2001). According to them, a work team (and an NPD team is one kind of a work team) can be defined using five characteristics:

- ⇒ A social system consisting of three or more people



- ⇒ This social system is embedded in an organization
- ⇒ The members of the social system perceive themselves as a social system
- ⇒ Others perceive those members as being member of a social system
- ⇒ The members of the social system collaborate on a common task

Thus, to speak of teams each of the five characteristics *must* be present to distinguish a collection of persons from a team, according to this definition.

The aforementioned characteristics of a team, however, seem not to be sufficient in the context of this study. Since NPD teams are subject of this study, a more thorough understanding of NPD teams is necessary. NPD teams share the same five characteristics with non-NPD teams indeed, NPD teams are far from similar to natural teams such as production teams at, for example, a car manufacturer. Therefore, a description of NPD teams is given including major obstacles of NPD team management. The aim is that the reader understands the complexity of NPD teams, opposed to natural work teams.

NPD teams can be described as cross-functional project teams, mostly within high-technology organizations, which generate novel products and/or processes (Keller, 2001). These teams consist of members whose functional background is often specialized and different from other members. For example, an NPD team which develops a new fabric with applications in the aviation industry, may consist of several chemical engineers, an airplane construction engineer, an aerodynamics engineer, a marketer, a process engineer, etc. As was noted earlier in the introductory chapter 1, the advantages of a team over an individual ensures that a project as in the example will be finished earlier, with better quality, and at lower costs than when all tasks are performed by one individual.

The backside of the advantage of a team is the necessity of coordination and communication between team members which makes the team form of organization far more complex than the individual. Coordination and communication seems to be even more complex for NPD teams than for non-NPD teams. As stated above, successful NPD requires input of people working in different (functional) departments which has to be coordinated (Ozer, 2000). For example, each department may have its own jargon and culture which make coordination more difficult than when team members are from a single department. Moreover, NPD often requires the involvement of customers and business partners which make coordination and communication difficult as well (Ozer, 2000). Regarding communication, NPD teams encounter more challenges than non-NPD teams. Leenders, Van Engelen, and Kratzer (2003) confirm this with their statement that “NPD team members obtain information on markets, technologies, competitors, resources, technical (sub)solutions to product design (sub)problems, and translate this into a product design and strategy. Consequentially, the vehicle of NPD is communication” (Leenders et al., 2003, p. 70). This variety of communication channels make

the NPD team processes more complex than the processes in non-NPD teams. In sum, coordination and communication in NPD teams are more complex compared to the same processes in non-NPD teams.

To conclude, a last distinction between NPD teams and teams not engaged in NPD that is emphasized here is uncertainty. NPD teams differ in a sense that these teams, opposed to non-NPD team, are often confronted with an unknown path and an unknown goal (Van Eijnatten and Putnik, 2005). That is, the *destination* or the end product (or process) is unknown as well as the *road* to that final destination. NPD teams can therefore best be symbolized as a team on a journey to a desired destination which is, from the very beginning, unknown and of which there is no *roadmap* available as well. Therefore, it can be said that NPD projects and its accompanying processes are actions in order to strive for real novelty (Van Eijnatten and Putnik, 2005). In sum, it makes sense to differentiate between NPD teams and non-NPD teams solely based on differences in communication, coordination, and uncertainty.

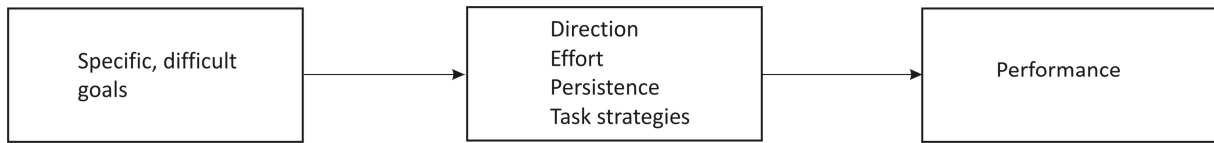
This part has introduced a definition of a team in general and has explained the meaning of teams for an organization. Furthermore, the role of NPD teams in innovative environments has been explained. Lastly, differences between NPD teams and non-NPD teams have been clarified. Concepts and definitions from this introduction are useful for comprehension of the remainder of this report.

In order to find a way to overcome the problems of complexity and uncertainty as described above, organizational scientists suggest that goal setting theory may assist in finding a solution. Therefore, this chapter is continued with another central theme in the current study: goal setting theory.

## 2.2 Goal setting theory

One of most validated theories of human performance enhancement is goal-setting theory (Locke and Latham, 2002). According to more than 400 studies, specific and difficult goals leads consistently to higher performance than when one sets easy or vague 'do-your-best' goals (Locke and Latham, 2006). Furthermore, several studies have provided evidence that goals results in higher performance through several mediating mechanisms (Locke and Latham, 2002). These underlying mechanisms seem to improve performance through "affecting the direction of action, the degree of effort exerted, and the persistence of action over time" (Locke, 1996, pp. 120). Furthermore, a fourth mediator, task knowledge or task skill (latent variable: task strategies) play an important, somewhat complex role (Locke, 2000). The relationship between goals and performance through its mediating mechanisms is depicted in Figure 2.

**Figure 2 Main model goal setting theory**



The picture of goal setting is not complete without mentioning the role of moderators in the goal-performance relationship. In the past, interacting mechanisms (moderator roles) have been subject of studies as well. According to Locke and Latham (2006), four key moderators playing a role in goal setting are feedback, goal commitment, task complexity and situational constraints. Since it would be going too far to provide a detailed review of the roles of moderators in individual goal setting, a short description of the interaction effects in individual goal setting is given in table 1. Note that ‘role overload’ in table 1 is only one example of a situational constraint. See for example Locke and Latham (2002) for a detailed description of all the moderating effects and other types of situational constraints.

**Table 1 Moderators in individual goal-performance relationship**

Moderator	Interaction effect
Feedback	Goal-with-feedback conditions outperform goal-alone conditions
Goal commitment	Commitment and performance are stronger related when goals are difficult
Task complexity	The goal-performance relationship is weaker when high complex tasks are performed
Situational constraints	Role overload negates the positive effects of goal setting

Though the model of goal setting, as mentioned above, is based on individual goal-performance studies, the concept of goal setting in teams has been studied as well. A frequent referenced study is the meta-analysis conducted by O’Leary-Kelly, Martocchio, and Frink (1994). The results of this meta-analysis provide evidence that, from the perspective of the team level, setting group goals positively contributes to the performance of teams. They observed that groups with goals scored 0.92 standard deviation higher on performance than groups without goals (O’Leary-Kelly et al., 1994). Due to the fact that potential mediators have hardly been studied, there is no evidence for similar mediating mechanisms in team goal setting as in individual goal setting (although these mechanisms may exist). However, lack of evidence for these mechanisms cannot rule out the possibility that these mechanisms yet do exist.

Based on the aforementioned, it can be concluded that goal setting theory is both applicable to individuals and teams. However, there is evidence that goal setting works different when comparing individual goal setting and team goal setting. The fact that team goals, not individual goals, can be

simultaneously set at the individual level and the team level sheds a different light on goal-performance relationships at the team level (see for example DeShon, Kozlowski, Schmidt, Milner, and Wiechmann, 2004; or Mitchell and Silver, 1990).

To provide background information for the current study of NPD teams, it is useful to review the literature concerning team goal setting in innovative environments and in NPD teams in particular. The next part describes important results of studies involved with goals in NPD teams.

### **2.3 Team goal setting in NPD teams**

The last part of the theoretical background section reviews studies regarding team goal setting in NPD teams. Though little research has been conducted in the field of team goal setting in innovative projects, it is important to overview past research to get acquainted with this field in order to understand the remainder of this report.

Many scholars in the area of human performance management admit that creativity is an important, if not, a prerequisite factor for NPD teams (Amabile, 1988; Shalley and Gilson, 2004). Creativity has been conceptualized as the generation of new and useful ideas (Shalley and Gilson, 2004). Thus, the relatedness of creativity and NPD projects seems to be logical in a sense that it both relates to novelty. Therefore, it is interesting to review the literature regarding the role of goals in the enhancement of creativity. Note that most of this work has its point of view from the individual level of analysis instead of the team or group level of analysis. Unfortunately, literature linking teams goals and creativity is lacking and since the individual level of theory regarding creativity may be generalized to the team level, it is decided to introduce this research avenue.

A review of the literature learns that the topic of creativity enhancement through goal setting has been investigated first around 1991. The work of Shalley (1991) is the first article that investigated that role. Creativity goals can be viewed as a stated standard that prescribes that a certain output should be creative (novel and appropriate). In this experiment, participants were asked to respond to a series of field problems a company director experienced at his or her work. The role of the director was simulated by each participant of the study. Results indicated that high levels of creativity (and productivity) were obtained when either a difficult productivity goal and a do-your-best creativity goal or a difficult productivity goal in combination with a difficult creativity goal were assigned. This study meant the starting point for more research in the field of creativity and goal setting.

A second study related to this topic was conducted by Carson and Carson (1993). They noted that there had been paid little attention to study motivation in combination with creativity. Although this work tended to replicate the results of Shalley (1991), described above, an important difference with

the work of Shalley (1991) was that it included feedback (besides goals only). Subjects in the study of Carson and Carson (1993) were asked to list (in one minute) as many objects as possible which could be described by five adjectives that were given. Similar to one result of Shalley (1991), this study revealed that subjects that were assigned creativity goals with or without a quantity goal, performed significantly better in terms of creative results than those with a quantity goal only.

Theory building around goal setting theory in NPD teams had been started in the last decade. It seems that scholars have found the importance of this research area relatively late. However, the relative small amount of research that combines team goal setting and innovation to date, indicates that this topic is still probably of little interest despite significant effects of (aspects of) team goals for NPD team performance.

Hoegl and Parboteeah (2003) were the first scholars who addressed the question regarding the potential beneficial effects of goal setting on performance in NPD projects. Software development teams from German companies were used to investigate several hypotheses about goal setting practices, effectiveness, and efficiency. The obtained observations in this study let us conclude that team goal setting was positively correlated with team effectiveness ( $r = .18, p < .05$ ) and team work quality<sup>3</sup> ( $r = .16, p < .05$ ). However, team goal setting was not significantly related to team efficiency. Furthermore, the results provided evidence that team work quality significantly moderates the relationship between goal setting and both team effectiveness and team efficiency (Hoegl and Parboteeah, 2003).

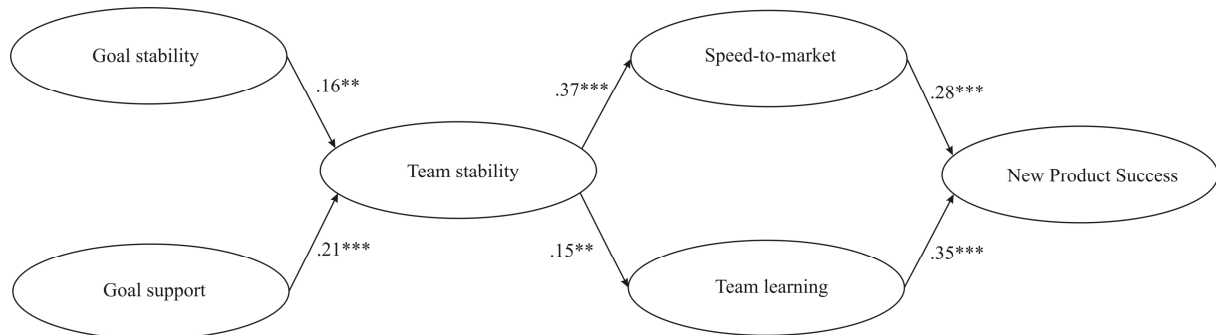
Another study which has investigated the relation between team goal characteristics and NPD team performance is the work of Akgün and Lynn (2002). They studied 211 cross-functional NPD teams and included goal stability, goal clarity, and goal support in their analysis for explaining the variance in new product success. Goal stability was defined as the stability of goals from the beginning of the project through commercial launch. Goal clarity was defined by as “the precision and detail of what the team is trying to accomplish” (Akgün and Lynn, 2002, p. 268). Goal support was defined as “a goal that team members and company management *buy into*” (Akgün and Lynn, 2002, p. 269). Through structural equation modelling, this study provides evidence that goal stability had a significant and positive relationship with team stability, measured by team member turnover (path coefficient  $\beta = .16, p < .05$ ). Furthermore, goal support was positively related to team stability as well (path coefficient  $\beta = .21, p < .01$ ). Team stability, in turn, was strongly related to speed-to-market (path coefficient  $\beta = .37, p < .01$ ) and to team learning (path coefficient  $\beta = .15, p < .05$ ). These latter

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<sup>3</sup> Team work quality was measured by the authors as a higher order construct representing: (a) open sharing of relevant information; (b) coordinating team tasks; (c) utilizing all team members’ knowledge and expertise; (d) mutually supporting each other; (e) exerting all efforts on the team task; (f) promoting team spirit and cohesion

two factors were good predictors for NPD success. Note that goal clarity did not reveal any significant relationship. See Figure 3 for a visual representation of the results of this study.

**Figure 3 Results obtained by Akgün and Lynn (2002, p. 275)**



Another study, conducted by Lynn, Skov, and Abel (1999), studied goal clarity and goal stability (both goal characteristics were defined the same as in the study from Akgün and Lynn, 2002) related to NPD performance (speed / time-to-market and new product success) in a sample of 95 NPD teams. The regression analysis in this study provided evidence that goal stability significantly predicts speed-to-market ( $\beta = .38, p < .01$ ). Furthermore, goal stability predicted new product success significantly ( $\beta = .31, p < .05$ ). In sum, the studies of Akgün and Lynn (2002) and Lynn et al. (1999) emphasize both the importance of stable and clear goals for NPD teams and their success.

A fourth research avenue that studied team goals in NPD teams is the study of Hoegl and Parboteeah (2006b) who studied team goal commitment in NPD teams. They defined team goal commitment as “the level of team member’s personal determination to reach the team’s collective goal” (Hoegl and Parboteeah, 2006, p. 300). Note that goal commitment at the individual level was proven to moderate the relationship between specific, difficult goals and performance. The researchers investigated 145 software development teams from four German companies (software development laboratories). The analyses of this study reveal that, when controlling for goal setting practices<sup>4</sup>, there was a positive relationship between team goal commitment and team performance for highly innovative software projects but no relationship between those two variables for projects that reflect low innovativeness (software upgrades). The researchers investigated some predictors for team goal commitment as well. Results show that that team goal commitment was predicted by task feedback ( $\beta = .21, p < .001$ ), participative decision-making ( $\beta = .29, p < .001$ ), and team size ( $\beta = -.18, p < .05$ ). In sum, judging from the work of Hoegl and Parboteeah (2006b), team goal commitment is an important factor for both improving team effectiveness and team efficiency (next to goal setting) in highly innovative projects.

<sup>4</sup> Goal setting practices, in this study, reflected goal stability, goal clarity, and goal specificity

The last ramification of team goal literature in NPD teams reviewed here relates to team reflexivity, one of the variables that are to be studied in this thesis as well. Team reflexivity, defined as “the extent to which teams reflect upon and modify their functioning” (Schippers, Den Hartog, and Koopman, 2007, p. 189) was studied in Chinese organizations. Tjosvold, Tang, and West (2004) studied the relation between team goal interdependence, team reflexivity, and innovation in teams in China. Goal interdependence, as defined by Mitchell and Silver (1990) as the extent that “members of a group share a common goal, whether or not they actually work together” (Mitchell and Silver, 1990, p. 185) was divided in three types: goal cooperation (common team goal), goal competition (conflicting goal among team members) and goal independence (no relation between each team member’s achievements). Innovation was defined as “the planned and effective introduction of change” (Tjosvold et al., 2004, p. 541). Structural equation modelling (Hair, Black, Babin, Anderson, and Tatham, 2006) revealed that goal cooperation was positively related to team reflexivity (path coefficient  $\beta = .53, p < .01$ ). Conversely, competitive goal interdependence was negatively related to team reflexivity (path coefficient  $\beta = -.21, p < .05$ ). The data in this study did not provide evidence for a significant relationship between independent goals and team reflexivity. Lastly, this study provides evidence for a positive relation between team reflexivity and team innovation. Although this study was not conducted solely in NPD teams, it can be cautiously inferred that innovation is positively affected by cooperated goal via team reflexivity.

This review of the literature aimed at providing a clear overview of the field of goal setting in innovative team settings. First, a short description regarding teams and the rationale for the widespread use of teams (in NPD) was provided. Subsequently, the current state of affairs regarding individual and team goal setting literature was provided added with a review of team goal literature in NPD teams. Though studied not much, team goal setting was found to be positively related NPD team performance. Furthermore, team and goal stability were found to contribute to speed-to-market which, in turn, affected new product success. Next, prior research found that team goal commitment predicted NPD performance for highly innovative projects. This review provides points of departure for the remainder of the current study and the next step is to formulate the hypotheses to be tested.

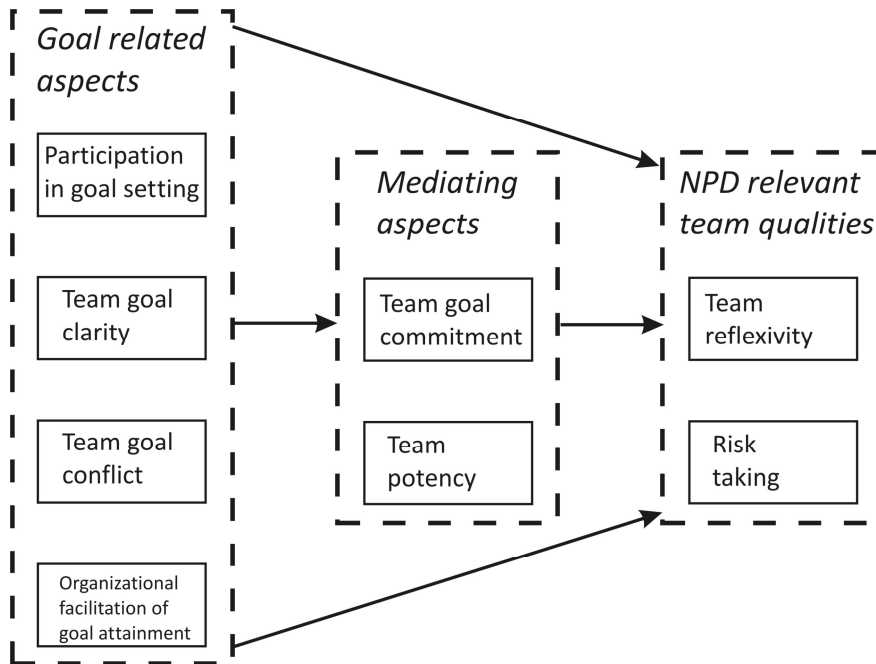
## **2.4 Hypothesis development**

This chapter will explain the underlying relations between the several constructs to be studied. Goal setting literature, as introduced in the former part, will form the basis of the research problem. Goal related aspects in team environments will be combined with specific NPD team qualities (block 2 from Figure 1) such as team reflexivity to form hypotheses which will be studied based on data collected from the field. Finally, the proposed hypotheses form the basis for the conceptual models under investigation which will be exhibited in the remainder of this chapter.



Before we elaborate on the various conceptual models (see Figure 5 – 8) an intermediate model will be provided. This model describes in general terms what exactly the relations are between the categories of variables. This intermediate model is depicted in Figure 4.

**Figure 4 Intermediate research model**



*Goal related aspects*

The goal related aspects in Figure 4 are human perceptions concerning goals (see left block in Figure 4). These perceptions consist of participation in goal setting, goal clarity, goal conflict, and organizational facilitation (remind that the choice to study perceptions has been explained in chapter 1).

The choice to insert the four goal related aspects has been based on the following argument. No single field study has been found which have investigated a relation between goal related aspects and the two NPD relevant team qualities. Due to the importance of risk taking (Keizer, Halman, and Song, 2002) and team reflexivity (Tjosvold et al., 2004) in the NPD process, and due to the presence of various clues for potential effects of goal related aspects on those team qualities (see chapter 1), the decision has been made to insert these four goal aspects. Thus, the choice for insertion these four goal aspects has been based on expected relations. The choice to insert the mediating aspects, team goal commitment and team potency, has been based expectations from prior research as well. Moreover, finding mechanisms tells something about the nature of the relationship which is valuable to get a thorough understanding of the link between goal aspects and NPD team qualities. A detailed



description of the expected relations have to be read in the part of this chapter regarding the hypotheses.

Before the process of hypothesis development can start, it is necessary to provide definitions of all the variables. Although some definitions have already been given, a complete overview of the meaning of each variable is necessary to prevent misunderstandings hereafter.

#### *Participation in goal setting*

The first goal related aspect in the intermediate model, participation in goal setting, has been defined by Lee, Bobko, Earley, and Locke (1991) as the willingness of team leaders to let subordinates participate in the setting of the team goals.

#### *Team goal clarity*

Team goal clarity can be best defined by the definition provided in chapter 2.3. that state that team goal clarity is “the precision and detail of what the team is trying to accomplish” (Akgün and Lynn, 2002, p. 268). Alternatively, Lee et al. (1991) characterize team goal clarity by the presence of clear objectives in the team (project) and Shaw (1981) defines team goal clarity as the extent to which the tasks of a group are clearly defined.

#### *Team goal conflict*

A formal definition have not been found in the literature. Goal conflict, as measured by Lee et al. (1991), contains elements such as too many goals, conflicts between roles, and conflict between the goals and personal values.

#### *Organizational facilitation of goal attainment*

Since a formal definition of organizational facilitation is lacking, a definition is made based on the items as suggested by Lee et al. (1991). Organizational facilitation of goal attainment embraces concepts as teamwork in goal setting, facilitative policies (of the company), sufficient resources, and efforts to facilitate goal accomplishment provided by supervisors (Lee et al., 1991).

#### *Team goal commitment*

Regarding the definition of team goal commitment, the definition from Hoegl and Parboteeah (2006) is used. They defined team goal commitment as “the level of team member’s personal determination to reach the team’s collective goal” (Hoegl and Parboteeah, 2006, p. 300).

### *Team potency*

Shea and Guzzo provide a work definition used for the remainder of this report. Team potency or group potency is defined as “the collective belief of a group that it can be effective” (Shea and Guzzo, 1987, p. 335).

### *Team reflexivity*

In previous literature, team reflexivity has been defined as “the extent to which group members overtly reflect upon, and communicate about the group’s objectives, strategies (e.g. decision making) and processes (e.g. communication) and adapt them to current or anticipated circumstances” (West, Garrod, and Carletta, 1997, p. 296). Note that this definition is quite similar to the definition mentioned before from Schippers et al. (2007).

### *Risk taking*

A definition of risk taking as meant in the context of NPD teams involves “the willingness to take action and make decisions to accomplish goals with the clear recognition that mistakes and errors might be made” (Tjosvold and Yu, 2007, p. 655). Risk taking thus involves deliberate attempts to deal with uncertainty when making decisions and the possibility of loss (Tjosvold and Yu, 2007).

Since all definitions have been provided, all preparations have been made to start the actual process of hypothesis development. This hypothesis development process starts with the hypotheses regarding team reflexivity. Subsequently, the hypotheses regarding risk taking are proposed.

### ***Hypotheses subset 1: Team Reflexivity***

A variety of studies have been demonstrated links between reflexivity and team innovation (Carter and West, 1998; West, 2002). Furthermore, team reflexivity is particularly useful for groups working on complex tasks in dynamic environments (Hoegl and Parboteeah, 2006a). Dynamic and complex environments are characteristic for NPD teams. Therefore, NPD teams would benefit from team reflexivity and this is confirmed by several studies.

Hoegl and Parboteeah (2006a) studied the relation between team reflexivity and team effectiveness in innovative projects and showed a significant and positive effect of team reflexivity on team effectiveness (standard coefficient = .19,  $p < .05$ ). Analyses of the association between team reflexivity and performance from a study conducted by Schippers, Den Hartog, Koopman, and Wienk (2003) revealed a significant association between team effectiveness and team reflexivity,  $F(1,45) = 32.52$ ,  $p < 0.001$ . As such, team reflexivity, being an important factor in team effectiveness, has been inserted in this study.

Besides the link between team reflexivity and team effectiveness, participative decision making has been showed to be related to team reflexivity as well. A study conducted by Carter and West (1998) among 19 BBC-TV production teams revealed that task reflexivity (the task related component of team reflexivity) was positively related to participation in decision making. Participation in goal setting could, therefore, be beneficial for team reflexivity as well, since participation in goal setting consists of making actual decisions regarding the (sub)goals of the team and therefore reflects participative decision making. Therefore, it is hypothesized that:

*H1: Participation in goal setting is positively related to team reflexivity.*

A second result of that study showed evidence that task reflexivity was positively connected to clarity of team goals (Carter and West, 1998). Intuitively, this relationship seems to be logical since clear goals provide team members less space for ambiguity (that is, little room for alternatives in the solution space) and therefore the phase of reflection on goals can take place. Indeed, reflection on goals is unlikely to happen when discussion on goals has not been finished fruitfully. Therefore, we hypothesize that:

*H2: Team goal clarity is positively related to team reflexivity.*

A third variable of interest that is proposed to influence team reflexivity is team goal conflict. Although empirical evidence for the relation between team goal conflict and reflexivity is lacking, it is a plausible relationship. Team reflexivity, as stated above, is partly defined as the extent of reflection on the group's objectives. An implicit assumption can therefore be proposed that reflection of these objectives can only take place if, at least, the group agrees on the objectives. Thus, if there is agreement, there is no conflict and it is more likely that the objectives are reflected. Furthermore it is observed (Lee, Bobko, Earley, and Locke, 1991) that goal conflict is highly correlated with goal stress ( $r = .29, p < 0.01$ ). Consequently, experienced emotional distress may let a person avoid certain situations that cues the stress situation (Van Eerde, 2000). Hence, team goal conflict may diminish team reflexivity due to diminished contacts between team members that feel stressed by the team (goals). Therefore, it is proposed that:

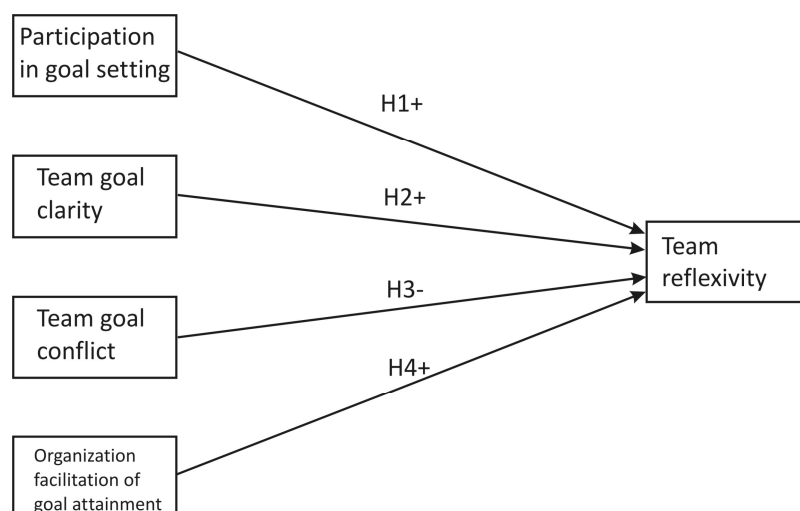
*H3: Team goal conflict is negatively related to team reflexivity.*

Organizational facilitation of goal attainment should affect team reflexivity as well. Indeed, this construct contains items about team work, facilitative policies of the company, resources, etc. (Lee et al., 1991). Though it may be expected to have large overlap with the construct of team reflexivity, we hypothesize a fourth predictor of team reflexivity:

H4: Organizational facilitation of goal attainment is positively related to team reflexivity.

These four hypotheses lead to the first conceptual (sub)model:

Figure 5 Submodel 1 predicting Team Reflexivity



In order to investigate the *mechanisms* between the proposed goal related aspects and team reflexivity, the role mediators play in this relationship will be studied as well. Goal commitment seems to be related to certain aspects of goal setting constructs which will be outlined.

First, participation in goal setting tends to be connected to goal commitment as well. Latham, Erez, and Locke (1988) found that goal commitment was positively affected by participation. Second, there are indicators that goal clarity is related to goal commitment. Though conceptually different than goal clarity, goal specificity has been showed to be correlated to goal commitment ( $r = 0.19$  for 7 investigated studies) in a meta-analysis by Klein, Wesson, Hollenbeck, and Alge (1999). Lastly, organizational facilitation of goal attainment seems to be related to goal commitment (Bipp and Kleingeld, 2009).

Finally, the relation between team goal commitment and team reflexivity needs to be discussed. A relation between team goal commitment and team reflexivity is expected in the following way. If a team consists of team members who have, on average, a strong commitment to their team goals, the team members are likely to be personally determined to reach the team's collective goal. Consequently, if the team tasks are highly complex (as this is true for NPD teams), it can be expected that team members will be more eager to find appropriate team strategies and processes. Thus, opposed to low committed teams, these teams are expected to be more reflexive since evaluating and

reflecting on objectives, strategies, and processes will increase the chance to achieve the goals of the team (which is important for those with high goal commitment).

For reasons provide above, we insert four partial mediation hypotheses in this part. Besides the direct role the four variables (from H1 – H4) may play in predicting team reflexivity, each individual relation may be mediated by team goal commitment as well. Therefore, we propose that:

*H5a: The relation between participation in goal setting and team reflexivity is partially mediated by team goal commitment.*

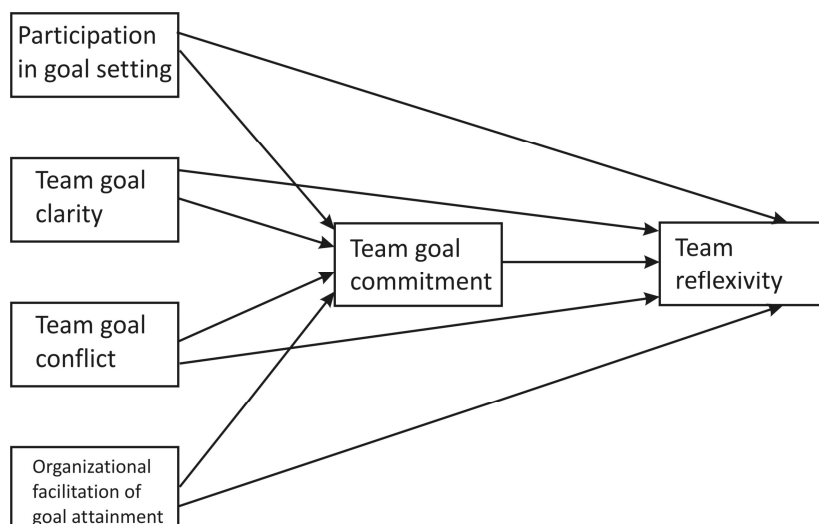
*H5b: The relation between team goal clarity and team reflexivity is partially mediated by team goal commitment.*

*H5c: The relation between team goal conflict and team reflexivity is partially mediated by team goal commitment.*

*H5d: The relation between organizational facilitation of goal attainment and team reflexivity is partially mediated by team goal commitment.*

The conceptual model of these hypotheses is depicted in Figure 6.

**Figure 6 Mediation model for team reflexivity**



### ***NPD Team Quality 2: Risk taking***

In classical theory regarding decision making, risk is commonly considered as the variation in the distribution of outcomes, likelihoods, and subjective value (March and Shapira, 1987). Risk measurement can take place in two ways. Either it is measured “by nonlinearities in the revealed utility for money” (March and Shapira, 1987, p. 1404) or by the variance in the probability distribution of gains and losses related to a particular alternative (March and Shapira, 1987). That is, risk averse persons prefer higher expected value but a low relative standard deviation of that same value.

When this definition is transposed to the field of innovation management, (highly) innovative products tend to have a high standard deviation of expected returns since the outcomes (e.g. sales from a new product) of this process are highly uncertain. Therefore, risk is inextricably connected to innovation and thus NPD processes. As some scholars assert, no risk means no reward, that is “companies must take risks to launch new products speedily and successfully” (Keizer, Halman, and Song, 2002, p. 213). The required risk for increasing the chance for successful innovations is confirmed by Takeuchi and Nonaka (1986), who state that a fair amount of risk is necessary to shorten NPD cycles. Therefore, we infer that increased risk taking is positively related to NPD speed, one of the important NPD performance variables.

Additionally, risk taking has been experimentally shown to be beneficial for performance. An experimental study conducted by Knight et al. (2001), provides empirical evidence that, on the team level, strategic risk is positively related to team performance.

More indirectly, research results provide evidence that a higher amount of perceived team psychological safety (opposed to low perceived safety) results in higher team learning behavior, which in turn leads to higher team performance (Baer and Frese, 2003). Furthermore, team psychological safety (defined by a shared belief that a team is safe when taking interpersonal risks) leads to increased risk taking (probably since potential losses due to risky behavior is not perceived as bad). Thus, team psychological safety can be seen as a prerequisite for risk taking. Hence, it is generally assumed that a climate which provides a non-threatening work environment is more successful (Baer and Frese, 2003).

A direct link between risk taking and creativity, a concept which innovativeness is often related to (see chapter 1), has been studied by Nystrom (1990). Nystrom observed that creativity was enhanced in an environment that encouraged and supported risk taking. Therefore, it is asserted that team risk-taking behavior is beneficial for NPD teams as well. In sum, risk taking seems to have positive effects on NPD team performance.

Evidence that taking risks can be linked to goals is provided by Knight et al. (2001). This experimental study revealed that one goal aspect, team goal difficulty, predicted strategic risk in a tank battle simulation. As we saw above, strategic risks in turn led to higher team performance. Though team goal *difficulty* is not studied in the context of this thesis, another important aspect of goals, goal specificity, will be taken into account. Since goal specificity and goal clarity are often used as synonyms (Wehmeyer, 2007) and since goal clarity is used previously in measurement scales (Lee et al., 1991; Bipp and Kleingeld, 2009) opposed to goal specificity, goal clarity is expected to play a role in risk taking.

There is evidence that goal clarity might be related to risk taking. In a study investigating the relationship between goal clarity and the manager's degree of risk aversion, Bozeman and Kingsley (1998) found that the lack of goal clarity was associated with a risk averse attitude. When this observation is extended to the team level instead of the level of the organization (as in their study), it could be expected that:

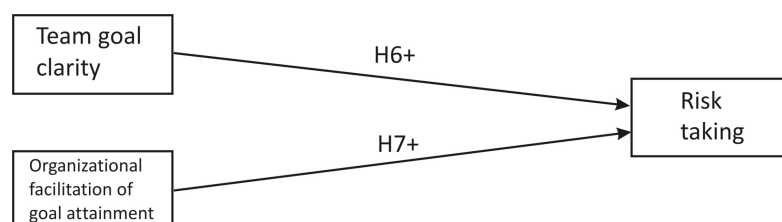
*H6: Team goal clarity is positively related to risk taking*

The second potential antecedent of risk taking that we propose to test is organizational facilitation of goal attainment. As stated above, it is the supportive climate of the organisation that is argued to enhance risk-taking behavior (Nystrom, 1990; West, 1990). Furthermore, Kahn (1990) found that when designers in architectural firms were encouraged to try new design techniques, as a consequence, their willingness to take risks and their willingness to try new things increased. Therefore, we propose that the organizational support component of the concept of goal practices is beneficial for enhancing risk-taking behavior.

*H7: Organizational facilitation of goal attainment is positively related to risk taking*

Since no evidence has been found regarding a possible relation between the other goal related aspects and risk taking, team goal clarity and organization facilitation are hypothesized as the only two predictors of risk taking. The visualization of both hypotheses is depicted in Figure 7.

**Figure 7 Conceptual submodel for predicting risk taking**



In addition to the conceptual model from Figure 7, an extended model will be proposed that involves a mediator. Krueger and Dickson (1994) have observed that executives who believed that they (and their organization) were highly competent, took more risks. For the team level, it is reasonable to see team potency as the substitute for individual belief in competence as stated by Krueger and Dickson. Furthermore, Knight et al. (2001) found that team efficacy (team potency is a generalized form of team efficacy) significantly predicted risk taking.

Since no literature was found that could confirm a relation between team goal clarity and team potency, it can only intuitively be hypothesized. Clear goals may provide the team unambiguous expectations and therefore, team members are better able to judge whether the team is effective regarding these clear goals. In all likelihood, teams that are able to *judge* their effectiveness have more chance for a shared belief that it will *be* effective than teams who are not even able to judge their effectiveness due to unknown expectations.

The proposed relation between organizational facilitation and team potency can be based on prior literature. Organizational facilitation may provide the team members a feeling of support (due to e.g. sufficient resources provided by the organization). De Jong et al. (2005) found a positive relationship between management support and individual perception of group potency. Since management support (from the study of De Jong et al., 2005) and organizational facilitation of goal attainment show similarities (for example, both constructs contain scale-items whether the organization provides a fair amount of resources), this relationship may support the proposed mediating role of team potency between organizational facilitation of goal attainment and risk taking. Thus, in addition to the two proposed direct relations (hypotheses 6 and 7), a partial mediating mechanism through team potency is proposed:

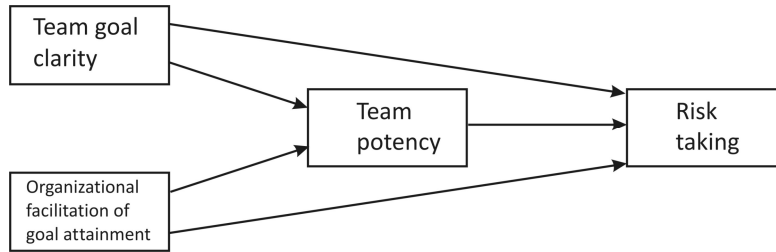
*H8a: The relation between team goal clarity and risk taking is partially mediated by team goal potency.*

*H8b: The relation between organizational facilitation of goal attainment and risk taking is partially mediated by team goal potency.*

This mediation hypothesis between the two goal practices and risk taking can be seen in the proposed conceptual model in Figure 7.



**Figure 8 Model for mediator role of team potency between goal practices and risk taking**



The hypotheses that are proposed in this part will be tested in chapter 4. However, the hypotheses testing phase will be described after the research method, which is discussed in the next chapter.

### 3. Research method

In this chapter the research method will be explained. First, the participants and the procedure to approach possible respondents will be described. Subsequently, the procedure of data collection is outlined. Chapter 3.3 describes the measures used in the study

#### 3.1 Participants

Participants were employees working in teams involved in new product/process development teams. The respondents are working in the field at different organizations. The next part describes the procedure to find appropriate respondents. Participation of all respondents was voluntary and participants were guaranteed confidentiality.

#### 3.2 Procedure

Cross-sectional data was collected from July 2009 to September of 2009 by administering each team the same questionnaire (see Appendix A) by email (MS Word document). However, before a questionnaire had been sent, each candidate (team) must satisfy a couple of requirements. The first requirement involved the respondents to be member of a product or process development team not necessarily from a technology oriented organization. The reason for the possibility to include non-technology oriented companies, in addition to technology teams, is that teams from other types of industry (e.g. food and non-food producers) have developed innovative products in the past as well (Keizer et al., 2002). The second requirement implied each respondent to be member of a (development) team. Thirdly, it must be possible that a candidate could deliver at least three team members from one team in order to be able to aggregate individual level data to a team level of analysis. To ensure that these requirements were met, all candidates were asked whether they could satisfy these requirements. If so, and the candidate approved the process of data collection, the questionnaire was sent to the respondents. No incentive for participation was used.

The search strategy used for this study consisted of two parallel components. First of all, persons from the graduate's social network were mobilised to find appropriate candidates. These network contacts were either asked to find participants within their department or to find other contacts who belong to their own social network. The second part of the search strategy involved the inclusion of a Dutch national database of engineers from the association KIVI-NIRIA (Koninklijk Instituut Van Ingenieurs). This association consists of a network of 25000 members who (all) are engineers from all possible engineering disciplines. This association has an online member database<sup>5</sup> that contains information of all members ranging from educational level, name of the institute of education each member has studied at, current occupation, and contact information (e-mail address of the member).

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<sup>5</sup> This database is only accessible for members.

The following criteria were used to contact persons from these database. The profile of each candidate must met the criterion that he or she worked for a potential innovative company as a product or process developer, or that it was likely that he or she worked in a development team (if the name of the company was unknown). This latter could be speculated if, for example, a person filled out that he or she was an electrical engineer working as a project manager. Candidates that met the criteria were invited by email and the same requirement as stated above were mentioned in the invitation. No incentive for participation was used.

In order to ensure participating team members could be traced back to one team, online questionnaires were found to be unsuitable. Indeed, online questionnaires need to be coded somehow (for identification) and this may inhibit persons to fill out the questionnaire. By sending a questionnaire via email (MS-Word document) to the respondents, it could be easily verified who belongs to which team.

Each participant was requested to fill out the questionnaire and to resend the questionnaire dependent on the agreements with the respondent. The questionnaire was written in English to ensure validity of the items which might be decreased or even lost if Dutch translations of the ample studied scales were used. A second reason is that we expected non-Dutch speaking respondents. Since it was expected that most of the respondents were Dutch speaking a list of words was enclosed to the questionnaire that contained English-Dutch translations of words that were expected to be potentially difficult to understand for layman. By the addition of this list, biased or unanswered responds due to incomprehensible questions were prevented. Lastly, all responded questionnaires were entered into a SPSS datafile.

### **3.3 Measures**

This part describes the measures used in the questionnaire (see for a complete overview of the questionnaire, Appendix A). First of all, the measures of the independent variables will be introduced. Subsequently, measures used for assessment of the dependent and mediation variables are provided. Lastly, the control and background variables are discussed

#### **3.3.1 Independent variables**

The basis for measuring goal setting practices as mentioned in the part about hypotheses development is the goal setting questionnaire (GSQ) taken from Lee et al. (1991) and Bipp and Kleingeld (2009). Four out of five constructs used in this study are originated from the GSQ.

##### *Taam Goal Clarity*

The items for team goal clarity are taken from the article of Lee et al. (1999) and Bipp and Kleingeld (2009). The items are adapted to be applicable to the team level of analysis. That is, words like ‘I’ and

'my' are changed in 'the team'. Below, we find the 4 items which were answered using a 5-point Likert scale ranging from (1) nearly never to (5) nearly always. Cronbach's alpha, a measure for the reliability of a measurement scale, was 0.67 regarding the version Lee et al. (1991) used.

***Team Goal Clarity; adapted from Lee et al. (1991)***

1. The team understands exactly what it is supposed to do on its job.
2. The team has specific, clear goals to aim for on its job.
3. If the team has more than one goal to accomplish, the team knows which ones are most important and which are least important.
4. The team I work with encourage me to attain our goals.

***Participation in Goal Setting***

This scale is taken from the work of Lee et al. (1991). The items of this dimension are adapted from Lee et al. (1991) to be applicable for the team level. That is, words like 'I' and 'my' are changed in 'the team'. The frame below provides an overview of the items. The items had to be answered on a 5-point Likert scale from (1) nearly never to (5) nearly always. Cronbach's alpha was 0.82 regarding the version of the scale Lee et al. (1991) used. This scale contains 3 items.

***Participation in Goal Setting ; adapted from Lee et al. (1991)***

1. The team's boss lets the team participate in the setting of its goals.
2. The team's boss is supportive with respect to encouraging the team to reach its goals.
3. The team's boss lets the team has some say in deciding how the team will go about implementing its goals.

***Team Goal Conflict***

This items of this dimension are adapted from Lee et al. (1991) as well. For this scale too, the items had to be applicable for the team level. The frame below provides an overview of the items. The items were answered on a 5-point Likert scale from (1) nearly never to (5) nearly always. Cronbach's alpha was 0.74 regarding the version of the scale Lee et al. (1991) used.

***Team Goal Conflict ; adapted from Lee et al. (1991)***

1. The team has too many goals on this job (the team is too overloaded).
2. Some of the team's goals conflict with each other.
3. The team is given incompatible or conflicting goals by different people (or even by the same person).
4. The team has unclear goals on this job.
5. The team's job goals lead the team to take excessive risks
6. The team's job goals serve to limit rather than hurt goal attainment.
7. The goals the team has on this job leads the team to ignore other important aspects of its job.
8. The goals the team has on this job focus only on short-range accomplishment and ignore important long-range consequences

***Organizational Facilitation of Goal Attainment***

The 5 items of this dimension are adapted from Lee et al. (1991) to be applicable for the team level. The frame below provides an overview of the items. The items are answered using a 5-point Likert scale from (1) nearly never to (5) nearly always. Cronbach's alpha was 0.63 regarding the version of the scale Lee et al. (1991) used.

***Organization Facilitation of Goal Attainment; adapted from Lee et al. (1991)***

1. The goals I have on this job are challenging but reasonable (neither too hard nor too easy).
2. Company policies here help rather than hurt goal attainment.
3. Work teams in this company work together to attain goals.
4. This company provides sufficient resources (e.g. time, money, equipment, coworkers) to make goal setting work.
5. During performance appraisals interviews, my boss schedules a follow-up meeting so that we can discuss progress in relation to the goal.

**3.3.2. Dependent variables**

The next part describes the measurement scales for the three dependent variables in this study: team reflexivity, external information seeking, and risk taking.

***Team Reflexivity***

The items of the dimension for team reflexivity is based on the five item scale from Hoegl and Parboteeah (2006a). The frame below provides an overview of the items. The items were answered on a 5-point Likert scale from (1) strongly disagree to (5) strongly agree. No item of this scale has been changed. Cronbach's alpha was 0.77 regarding the version of the scale Hoegl and Parboteeah (2006a) used in their sample.

***Team Reflexivity ; original from Hoegl and Parboteeah (2006a)***

1. My team investigated and observed the context and the progress of our project (e.g. task performance strategies, goals, project requirements, the organizational context, etc.).
2. My team adjusted its task performance strategies in response to changes in the context and progress of the project.
3. My team spent an adequate amount of time considering the likely consequences of its task activities (e.g. considerations regarding usability of the product, compatibility with other products, cost, etc.).
4. Strategies and work approaches chosen were later checked for their appropriateness.
5. My team learned from its experiences.

***Risk Taking***

The concept of risk taking is a somewhat underrepresented regarding an established measurement scale. This has undoubtedly to do with the paradigm under which risk taking is often studied. Since our study is no experimental study, we need participants to derive their risk taking behavior itself. Some studies seem to embrace the concept of risk taking from a descriptive/perceptual point of view. We have found two studies that reported items that contain risk taking elements. One item from each study was taken that contained content which emphasizes risk taking *behavior* (and not risk taking *climate*). The two items chosen to be inserted in the scale can be seen in the frame below. The first item, derived from Caldwell and O'Reilly (2003), is from a scale which measures a climate for innovation. One dimension of that scale is labeled support for risk taking. The second item, from Dess, Lumpkin, and Covin (1997) reflects a risk taking attitude. We decided to connect both items with a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree.

***Risk Taking***

1. The team encourages members to try new things.
2. Most people in our team are willing to take risks.

**3.3.3. Mediating variables**

The mediating variables, team goal commitment and team potency, are measured using the scales described in this part.

***Team Goal Commitment***

The first mediating construct that is of interest is team goal commitment. A measurement scale for goal commitment on the individual level is based on the work of Klein, Wesson, Hollenbeck, Wright, and DeShon (2001). Their proposed five-item scale has been proven to be (highly) stable. Moreover, its robustness seems to be high since the construct has consistent properties across several settings and contexts (Klein et al., 2001). The items are answered on a 5-point Likert scale ranging from (1)

strongly disagree to (5) strongly agree. The observed alpha scale for reliability in the study by Klein et al. (2001) was 0.743.

***Team Goal Commitment ; adapted from Klein et al. (2001)***

1. It's hard to take the goals of our team seriously.
2. Quite frankly, I don't care if I achieve the team goals or not.
3. I am strongly committed to pursuing the team goals.
4. It wouldn't take much to make me abandon the team goals.
5. I think the team goals are good goals to shoot for.

*Team Potency*

The second mediating variable that is considered is team potency. A well studied measurement scale for team potency is based on the scale used by De Jong, De Ruyter, and Wetzels (2005). The items of this scale are answered using a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree. The items can be found in the frame below. De Jong et al. (2005) observed a reliability measure of 0.87 which means this scale was a reliable measurement scale.

***Team Potency ; based on De Jong et al. (2005)***

1. Our team has confidence in performing the job requirements.
2. Our team believes it can become unusually good at self-managing.
3. Our team expects to be known as a high-performing team.
4. Our team feels it can solve any problem it encounters.
5. No task is too tough for our team.
6. Our team can get a lot done when it works hard.

### 3.3.4. Control variables

Control variables are variables whose effects may influence the primary analyses. Therefore, the basis analyses need to be controlled for the control variables. The control variables used in this study are team size and team age (sometimes called 'team tenure'). Team size is measured by the number of project team members in the team and team tenure is measured by asking the respondents how long (measured in months) the team members have worked on their NPD project.

Previous research suggests that team size of (NPD) teams can have significant effects on interaction / communication among team members (Hoegl and Parboteeah, 2006a). Therefore, the size of the team may have influences on team reflexivity. The main argument given, states that large teams have low quality interaction patterns due to the large increase of (possible) individual connections between the members as the team grows (Hoegl and Parboteeah, 2006a).

Conversely, team tenure (how long team members had worked together on the team) may influence relationships regarding the risk-taking aspect of teams. Wiersema and Bantel (1992) found that top management team most likely underwent strategic changes, which may be presumed to be risky, when the team's tenure was high. Furthermore, team tenure may influence information sharing among team members and thus team reflexivity (Hoegl and Parboteeah, 2006a; Leenders, Van Engelen, and Kratzer, 2003). The argument for this proposition is that when the age of a team increases, the "problem solving and cognitive processes become more established, reinforced, and habitual through uncertainty reduction by team members" (Leenders et al., 2003, p. 78).

### 3.3.5. Background variables

In conjunction with the dependent, independent, mediation, and control variables, the questionnaire involved background variables. These variables were measured at the nominal, ordinal, and the interval level. The aim to insert these variables was to be able to get more insight in the processes of the team. Moreover, the background variables may assist in the analysis of the data and in the explanation of the results.

The following subsets of background variables had been collected. There were three categories of background variables: individual, team, and organizational background variables.

#### A. Individual background variables:

- Gender ; (nominal scale)
- Age ; (interval scale)
- Nationality ; (nominal scale)
- Highest education of the respondent ; (ordinal scale)
- Position in the organization of each respondent ; (ordinal scale)

#### B. Team background variables:

- The source of the goal (imposed, self set, mixed set goals) ; (nominal scale)
- Frequency of goal setting ; (ordinal scale)
- Reward interdependence (whether the team member individually or the whole team as a whole is rewarded) ; (nominal scale)
- Type of team (new product team, new process team, or other) involved with the team ; (nominal scale)
- Type of innovation (radical, incremental, or in between radical and incremental innovation) involved with the team ; (nominal scale)



C. Organizational background variables:

- Type of industry, the team of the respondent was active in ; (nominal scale)
- Size of the organization each respondent worked for ; (ordinal scale)

All kinds of variables and accompanying measures have been described. The next step is the description of the data analysis and the results.

## 4. Data analysis and results

This part contains the analysis of the data obtained by the returned questionnaires. Firstly, results regarding background data will be described in paragraph 4.1. Subsequently, descriptive statistics regarding the used scales are provided in part 4.2. The next part will explain issues of aggregation. Paragraph 4.4, eventually, will discuss the regression analyses and tests the proposed hypotheses from chapter 2.

In total 92 invitations have been sent to appropriate KIVI-NIRIA engineers for this study. Furthermore, approximately 30 persons within the graduate's network were asked to assist the search process. In total, data of 24 teams were collected of which 6 teams were derived from the KIVI-NIRIA database.

### 4.1 Background data

This part provides an overview of the background variables involved in this study. First, data regarding individual background variables are discussed. Subsequently, team background data are analyzed. Lastly, organizational background data will be discussed.

#### 4.1.1 Individual background data

Data on the individual level was obtained through inserting questions regarding personal information. Analysis of these questions revealed the following subset of observations. The sample mean age of the respondents was 36.63 years with a minimum of 24 and a maximum of 65 years. Standard deviation of the sample age was 8.60 years and there was one missing value. Furthermore, the majority of the sample population was male (85.5%), one respondent did not respond to this question. Concerning the respondents' nationalities, a large majority of the respondents were Dutch (97,4%). The sample contained two cases that were non-Dutch: one respondent came from the UK and one from Portugal (all respondents worked in The Netherlands). Subsequently, educational levels of the respondents differed from MBO to university. From the respondents, 31.6% had a university degree, 51.3% had an HBO (college) degree and 14,5% had an MBO degree. Two cases can be considered missing regarding the education level. Regarding the position of the respondents in the organization, the following statistics were revealed. Respondents from high management were in minority (1,3%). 13.2% of the respondents were middle managers and 13.2% were team leaders or supervisors. That is, 7 teams in the sample had a returned questionnaire from a team leader. The majority of the respondents were product/process engineers (36.8%) and 25.0% were non-management technical employees. In conclusion, 9.2% of the team members were positioned in a staff function and one case is considered as missing data.

#### 4.1.2. Team background data

Variables having measured team background data are described in this part. Some team background variables showed inconsistency: team size, team tenure, team type, team goal source, frequency of setting the team goal, reward interdependence, and type of innovation. This problem was solved by contacting one of the members to discuss this inconsistency. The results of these discussions overruled the inconsistent individual responses where necessary.

Regarding the type of team, the sample shows that 15 out of 24 teams were product development teams. Almost one third (7 teams) were process development teams and two teams answered that they could not be categorized in either type of team. From the latter group, one of these teams seem to be both a product and process development team. The other unspecified team explained that they were a team of hydrology and software consultants/engineers, advising and co-developing an innovative process in the field of hydro engineering.

Another variable that has been collected, measured the source of the goal of the project. The goals of the project were set by a supervisor/team leader in eight cases (33.3%). A larger amount, 14 teams, worked with mixed set goals (set both by team members and the team leader/supervisor) which makes this the largest category. Two teams answered that a higher management layer set the goals for the team and thus not the team leader/supervisor. Remarkable is that there were no teams in the sample that contained self set goals (set by the team members itself).

The next team related background variable concerned goal frequency. Within the total sample, 11 teams (45.8%) declared to set goals every week. Goals which were set once a month was counted 5 times (20.8%) and 8 teams answered that they set their goals differently in terms of frequency than the prescribed answer options. Four gave an answer that the goals were set after a new milestone. Two teams set goals at irregular times during the project and two teams declared that they set goals once, at the beginning of the development project.

About the variable that measured team rewarding, the following could be observed. The least observed answer was the option that indicates that each team member is rewarded individually (3 teams, 12.5%). The option that indicated that the whole team is rewarded was measured 11 times (45.8%) followed by the option other than the provided answer indications. Of these answers (‘ other’ ), nine teams answered that they get no rewards and one team explained that a reward depends on the result.

The last qualitative item of the questionnaire contained a question about the type of innovation. Two teams worked/had worked on a radical innovation (new technology, new market). Furthermore, 11

teams worked on an incremental innovation and another 11 teams worked in a project that can be indicated as in between a radical and an incremental innovation.

### 4.1.3. Organizational background data

Data regarding organizational background variables show the following descriptive data. Regarding the type of industry of the teams (and thus their organizations), 12 out of 24 teams answered that they worked in another type of industry than the optional choices provided in the questionnaire. The other 12 teams could be categorized in one of the prescribed options in the questionnaire. Table 2 provides an overview of the types of industry which have participated in the study.

**Table 2 Type of industry of the team sample**

<i>Type of industry</i>	<i>N</i>
Building industry	1
Software industry	5
Telecommunication industry	1
Consumer electronics industry	1
Automotive industry	0
Chip manufacturing industry	0
Chemical industry	0
Consultancy	3
Service industry	0
Financial services	0
Education / University	1
<i>Other</i>	
Energy distribution	1
Hydro engineering	2
Lighting electronics	4
Printing industry	2
Rail infrastructure	1
Fashion industry	1
Food industry	1

## 4.2 Descriptive statistics

A thorough analysis of the data has been conducted. Both individual level and team level variables have been inspected. In table 3, descriptive statistics such as minimum, maximum, mean, and standard deviation are displayed. Furthermore, correlations between the (aggregated) variables and the reliability coefficients (Cronbach's  $\alpha$ ) are showed in this table. Note that the reliability coefficients are based on the individual scores. Since the variables team size and team tenure are measured using a single item, reliability scores for these variables are not included in table 2.

**Table 3 Descriptive statistics**

	Min	Max	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Organizational facilitation of goal attainment	1.87	4.27	3.19	0.58	<b>.68</b>									
2. Team goal conflict	1.92	3.67	2.57	0.55	-.34	<b>.78</b>								
3. Participation in goal setting	2.00	5.00	3.73	0.72	.13	-.44*	<b>.80</b>							
4. Team goal clarity	2.50	4.58	3.54	0.60	.48*	-.19	.12	<b>.78</b>						
5. Team goal commitment	3.13	4.60	4.02	0.38	.35	-.63**	.30	.19	<b>.71</b>					
6. Team potency	2.83	3.94	3.48	0.30	.18	-.12	.44*	.58**	.20	<b>.61</b>				
7. Team reflexivity	2.60	4.27	3.50	0.48	.51*	-.52**	.16	.00	.41*	-.05	<b>.73</b>			
8. Risk taking	2.17	4.17	3.31	0.54	-.39	-.12	.20	-.13	.07	.31	-.11	<b>.70</b>		
9. Team size	3	25	10.17	5.14	-.20	.08	-.26	-.12	-.28	-.15	-.23	-.16	<b>N.P.</b>	
10. Team tenure	2	24	10.85	8.02	.10	-.01	-.19	.24	.08	.25	.22	-.04	.62**	<b>N.P.</b>

Reliability of the scales (Cronbach's  $\alpha$ ), as measured at the individual level ( $n = 76$ ), are presented in bold printing on the diagonal. SD = Standard deviation. N.P.= Not possible  
Correlation coefficients, minimum (Min), maximum (Max) and standard deviation (SD) are based on aggregated team scores ( $N = 24$ ).

\* $p < .05$ ; \*\* $p < .01$

Table 3 provides a gauge for scanning the characteristics *of* and relationships *between* the different variables. This descriptive statistics table show that the reliability coefficients (Cronbach's  $\alpha$ ) for most variables are sufficient. According to DeVellis (2003), Cronbach's  $\alpha$  below 0.60 are unacceptable and values above 0.80 indicate that the scale is highly reliable. The reliability measures in table 3 indicate that all scales have an acceptable reliability coefficient

Several correlation coefficients among the measured variables are significant. Table 3 shows that the highest significant correlation is found between team goal commitment and team goal conflict ( $r = -.63, p < .01$ ). Furthermore, team potency seems to be positively correlated to team goal clarity ( $r = .58, p < .01$ ). Another high correlation coefficient is found between team goal conflict and team reflexivity which seems to be negatively related to each other ( $r = -.52, p < .01$ ). Team reflexivity seems to be correlated to another goal related construct: organizational facilitation of goal attainment ( $r = .51, p < .05$ ). Subsequently, the clarity of team goals is positively related to organizational facilitation ( $r = .48, p < .05$ ). Conflicting team goals are negatively correlated to goal setting participation ( $r = -.44, p < .05$ ). An equal correlation coefficient but in opposite sign is seen between team potency and participation in goal setting ( $r = .44, p < .05$ ). Furthermore, team goal commitment is positively correlated to team reflexivity ( $r = .41, p < .05$ ). Lastly, it is interesting to note that risk taking is not correlated to any variable at all.

### 4.3 Data aggregation

Most data in study are analysed at the team level. For each variable, individual scores were aggregated to mean scores on the team level. Furthermore, each variable consisted of more than one item. The score for each variable was calculated by averaging the scores for all corresponding items per person. Each team score then was calculated by averaging the scores of a construct for all the respondents of one team.

For justification of the aggregation for each variable, a one-way analysis of variance (ANOVA) was completed with team as the independent variable. To be justified for aggregation, within-group variance should be significant different from between-group variance. To be more precise, between-group variance should be significant larger than within-group variance to ensure that aggregation is justified. In table 4, it can be seen that team level differences were significant ( $p \leq .05$ ) for all variables. In sum, it is justified to aggregate the individual data concerning the subjective measures (variable 1 to 9 in table 4) to the team level of analysis.

**Table 4 One-way ANOVA for testing team level differences**

Variable	F	Sig.
1. Organizational facilitation of goal attainment	8.80	.000
2. Team goal conflict	8.73	.000
3. Participation in goal setting	11.37	.000
4. Team goal clarity	6.96	.000
5. Team goal commitment	2.16	.011
6. Team potency	2.26	.008
7. Team reflexivity	5.66	.000
8. Risk taking	2.51	.001

Within-group agreement as measured by  $r_{WG(J)}$  (James et al., 1984) was assessed as well.  $R_{WG(J)}$  is used to compare the amount of observed variance between group members to an amount of random variance expected. Random variance expected from a uniform distribution was used here. The reason to use the random distribution is that all variables were measured using a finite number of responses (5). Therefore, each answer option has an equal likelihood of being chosen, which makes the uniform distribution a justifiable candidate for the worst case variance (James et al., 1984). According to George and Bettenhausen (1990), the value of  $r_{WG(J)}$  greater than or equal to 0.70 is the usual justification criterion for aggregating data from the individual to the team level of analysis.

All values of  $r_{WG(J)}$  in the dataset are greater than 0.70, except four values for the variable risk taking. These four values [0.50; 0.55; 0.59; 0.59] are 17% of the total amount of  $r_{WG(J)}$  values for this scale. Since 83% of the  $r_{WG(J)}$  values for this scale is larger than 0.70 the conclusion is made that within-team ratings are homogeneous enough to justify aggregation.

**Table 5**  $R_{WG(j)}$  values for all variables

	Min	$R_{WG(j)}$ Median	Max
1. Organizational facilitation of goal attainment	0.76	0.965	0.99
2. Team goal conflict	0.84	0.97	0.99
3. Participation in goal setting	0.79	0.945	1.00
4. Team goal clarity	0.75	0.965	1.00
5. Team goal commitment	0.81	0.96	0.99
6. Team potency	0.90	0.97	1.00
7. Team reflexivity	0.77	0.96	0.99
8. Risk taking	0.50	0.92	1.00

Before the main analyses regarding the hypotheses are started, it is relevant to look for potential differences regarding the scores for different groups. This may bias the analyses and thus may influence the conclusions. When looking more thoroughly to the sample, it can be seen that there are differences between groups. For example, some teams responded to have no rewards, whereas others responded to have group rewards. Another example is the observation that some response teams had a team leader filled out a questionnaire, whereas other teams had not. To look for potential differences between kinds of groups regarding their mean scores on the subjective measures, several ANOVA results will be provided that would shed light on potential biases.

When comparing teams that have included a team leader in their response, it is observed that teams with response from a team leader scored significantly lower on the variable ‘risk taking’.  $F(1) = 5.46$ ,  $p < .05$ . One-way ANOVA did not reveal significant differences for other variables in the hypotheses.

The type of team, regarding whether a team developed products or processes, did not reveal significant differences in team scores. A more logical difference was seen for teams that differed in goal source. Teams which answered that goals were both set by the team members and the team leader scored significantly higher on participation in goal setting than teams who answered that goals were assigned by a supervisor. Moreover, teams who had assigned goals from higher management scored significant lower on participation in goal setting than teams who had assigned goals from a team leader. More remarkable is the observation that teams who had assigned goals by a higher management layer ( $N = 2$ ) scored significant higher on team goal clarity opposed to teams who had assigned or mixed set goals. Lastly, teams that had assigned team goals, scored significantly lower on team goal commitment.

Differences in goal frequency between groups did not reveal significant difference in scores on the subjective measures. Teams with different reward interdependence showed significant differences on scores regarding team reflexivity. That is, teams whose team members were individually rewarded

scored significantly lower on team reflexivity opposed to teams who received a team reward or no reward at all ( $F(2) = 5.04, p < .05$ ).

Lastly, teams that differed in the type of innovation showed no significant difference between the groups on one of the subjective measures. Appendix B shows the visual representations of the differences between groups. In chapter 5 (discussion) more is discussed regarding the aforementioned differences.

#### **4.4 Hypotheses testing**

This part describes the hypothesis tests regarding the proposed relationship between the variables. To test the proposed hypotheses regarding team reflexivity (par. 4.4.1.) and risk taking (par. 4.4.2.), multiple regression is performed. SPSS 17.0 is used as the statistical software package to execute the regression analyses

As stated in paragraph 3.3.4, control variables are inserted in the analysis. Control variables have several characteristics. They are of exogenous nature and do not differ during the study. Moreover, these variables may influence the results and therefore a deeper understanding of their role is necessary. The first analysis involves the role of the control variables.

##### **4.4.1. Team reflexivity**

First, the hypotheses regarding the prediction of team reflexivity are tested (H1 – H4). To test the hypotheses, multiple linear regression is used. The team reflexivity variable is regressed on the independent variables participation in goal setting, team goal clarity, team goal conflict, and organizational facilitation of goal attainment.

Before starting the analysis, it has to be ensured that the control variables do not influence the predictions of team reflexivity. Multiple linear regression with team reflexivity as the dependent variable and team size and team tenure as the predictors does not reveal a significant model,  $F(2) = 3.017, p > .05$  (see Appendix C for detailed results). Therefore, it can be concluded that the control variables do not influence team reflexivity.

Hypotheses 1, 2 and 4 propose positive relationships between team goal aspects and team reflexivity, whereas hypothesis 3 proposes a negative relationship. Moreover, remind that team reflexivity was both significantly correlated to organizational facilitation of goal attainment and team goal conflict.

The regression results are depicted in table 6. First of all, it can be observed that the regression model is significant, judging the F-value being significant:  $F(4) = 4.38, p < .05$ . Secondly, two of the four



predictor variables have significant values for the standardized coefficient. Both the standardized coefficient for the predictor variable organizational facilitation of goal attainment and for the predictor variable team goal conflict are significant. This means that both variables significantly contribute to the prediction of team reflexivity. Looking to the sign of these predictors show that team goal conflict negatively predicts team reflexivity and organizational facilitation of goal attainment has positive effects on team reflexivity. Lastly, the entire model explains a fair amount of the variance in team reflexivity: 48%. Therefore, the obtained results support hypotheses 3 and 4 and reject hypotheses 1 and 2.

**Table 6 Regression analysis: team reflexivity**

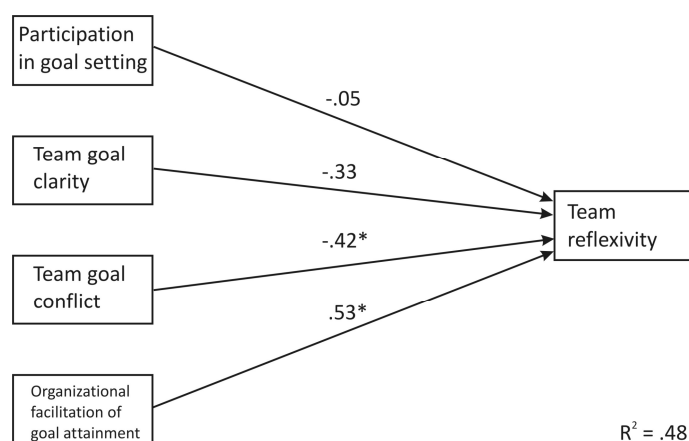
	Independent variables	Dependent variable
		Team reflexivity standard coefficient
Main effects	Participation in goal setting	-.05
	Team goal clarity	-.33
	Team goal conflict	-.42*
	Organizational facilitation of goal attainment	.53*
$R^2$		.48
$F$		4.38*

\*  $p < .05$  ; \*\*  $p < .01$

$N = 24$  teams

The results from table 4 are depicted in a visual model in Figure 9.

**Figure 9 Regression model predicting team reflexivity**



*Team reflexivity and mediation effects*

Since, a direct relationship between participation in goal setting and team reflexivity is lacking, the mediation hypothesis 5a cannot be supported as well. The same holds for hypothesis 5b since team goal clarity does not have is not correlated to team reflexivity. In sum, hypotheses 5a and 5b are rejected. Regarding mediation, hypotheses 5c and 5d can be tested since a direct relationship exists between team goal conflict and team reflexivity on the one hand and between organizational facilitation of goal attainment and team reflexivity on the other hand. To investigate the mediational relationships, two methods are necessary to prove mediation:

- (1) The procedure of Baron and Kenny (Baron and Kenny, 1986)
- (2) Sobel-test (Preacher and Hayes, 2004)

The first procedure is the most commonly used test of mediation in social sciences. The second procedure, the Sobel-test, seems to be superior in terms of power and Type I-errors. Though the Sobel-test is more robust, it's application is hardly seen (Preacher and Hayes, 2004). The Sobel-test calculates the significance of the indirect effect of a mediation model. Note that a Sobel-test need not to be executed if the procedure of Baron and Kenny does not reveal mediation.

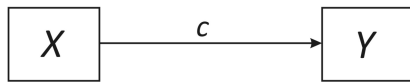
First, the procedure of Baron and Kenny will be explained and thereafter, the analyses will be explained. Note that these procedures for demonstrating the presence of mediation are similar for all remaining mediation analyses.

This explanation of mediation starts with the definition of a mediator. In general, a variable is said to function as a mediator if this variable accounts for the relation between an independent and a dependent variable. The more the mediator accounts for this relation, the more complete is the mediator in accounting for the relationship. If the mediator can account completely for the relationship, this variable is defined as a 'full mediator'. Opposed to a full mediator, partial mediators are found. In the latter case, the mediator accounts only for a part of the relationship between the predictor and the outcome variable (Baron and Kenny, 1986).

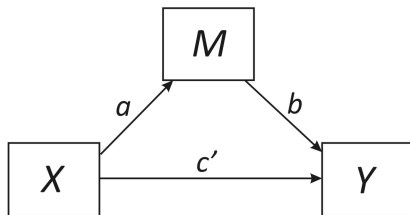
Now it remains to explain how a partial mediation effects can be proven<sup>6</sup>. This method will be explained based on the article of Preacher and Hayes (2004). The explanation starts with a graphical representation of the a direct effect (Panel A) and a mediation model (Panel B) in Figure 10.

**Figure 10 Two panels visualizing, after Preacher and Hayes (2004, p. 718)**

Panel A



Panel B



Variable  $M$  can be characterized as a mediator variable if: (1)  $X$  predicts  $Y$  significantly (i.e.  $c \neq 0$  in Figure 10), (2)  $X$  predicts  $M$  significantly (i.e.  $a \neq 0$  in Figure 10), and (3)  $M$  predicts  $Y$  significantly, while controlling for  $X$  (i.e.  $b \neq 0$  in Figure 10). One criteria not described by Preacher and Hayes (2004) is that the mediator must predict the dependent variable significantly as well (Mathieu and Taylor, 2007). This step is executed before assessing equation (4.3). These requirements are assessed by an estimation of the following three equations ( $i$  = the coefficient for the intercept):

$$\hat{Y} = i_1 + cX \tag{4.1}$$

$$\hat{M} = i_2 + aX \tag{4.2}$$

$$\hat{Y} = i_3 + c'X + bM \tag{4.3}$$

To apply the procedure from above in our analysis, it is useful that each step is now executed separately (see Appendix E for the SPSS output of the four steps).

Step 1: Regression analysis shows that team goal conflict significantly predicts team reflexivity:  $c = -.45$  ( $p \leq .01$ ).

Step 2: Regression analysis shows that team goal conflict significantly predicts team goal commitment:  $a = -.44$  ( $p < .01$ ).

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<sup>6</sup> This study restricts its explanation to partial mediation since full mediation is not proposed in one of the hypotheses.

Step 3: Regression analysis shows that team goal commitment significantly predicts team reflexivity:  $b = .51$  ( $p < .05$ ).

Step 4: Regression analysis shows that team goal commitment does not significantly predict team reflexivity anymore, when team goal conflict is inserted in the model:  $b = 0$ ,  $c' = 0$ , whereas according to Preacher and Hayes (2004) equation (4.3) is violated since  $b = 0$ , which is not allowed in order to meet the requirements for mediation. Thus, conducting a Sobel-test does not make sense since the requirements for mediation have not been met. These analyses lead to the conclusion to reject hypothesis 5c.

#### *Organizational facilitation of goal attainment and mediation effects*

The second mediating mechanism that is investigated, related to hypothesis 5d, takes organizational facilitation of goal attainment and team reflexivity into account. Again, the potential mediator is team goal commitment.

The same steps have to be executed as in the mediation analyses for team goal conflict (see Appendix F for the SPSS outputs).

Step 1: Regression analysis shows that organizational facilitation of goal attainment does not significantly predict team goal commitment:  $c = .23$  (*ns.*).

The result of the first step obliges the mediation analysis to stop from further analysis. Therefore, hypothesis 5d has to be rejected as well.

#### **4.4.2. Risk taking**

Hypotheses regarding risk taking will be tested in this paragraph. Before the four main hypotheses (H6 – H8b) will be tested, the potential role of the control variables, team size and team tenure will be investigated. Subsequently, the model without the mediating variables is studied and thereafter, the model with potential mediating effects for team potency are analyzed.

A potential effect for the two control variables is tested by a multiple linear regression model first. Team size and team tenure are inserted in a model that tests its significance. The results indicate that the model with the two predictors alone do not significantly explain the variance in risk taking (see Appendix G for the details regarding the regression model). Therefore, the potential influence of the control variables may be neglected.

The hypotheses regarding team risk taking predict, on the one hand, a positive relationship between organizational facilitation of goal attainment and risk taking. On the other hand it was proposed that

risk taking is positively affected by team goal clarity. When taking the correlation table from chapter 4 into account, it can be seen that risk taking is both moderately (though non-significantly) and negatively correlated to organizational facilitation of goal attainment and goal clarity. The regression analyses must give a decisive answer about the relationships when both variables are taken together in an attempt to test the model.

Based on the sample of 24 teams the results indicate that neither team goal clarity nor organizational facilitation of goal attainment predicts risk taking significantly. First of all, the predicted model is not significant ( $F = 1.926, ns.$ ). This means the analysis is stopped and that hypotheses 6 and 7 have to be rejected. Moreover, by rejecting hypotheses 6 and 7, the mediation hypotheses have to be rejected as well since no proposed predictor relates to the dependent variable. Therefore, the first requirement of a mediating relation will not be found. See Table 7 for details concerning the non-significant model.

**Table 7 Regression model risk taking**

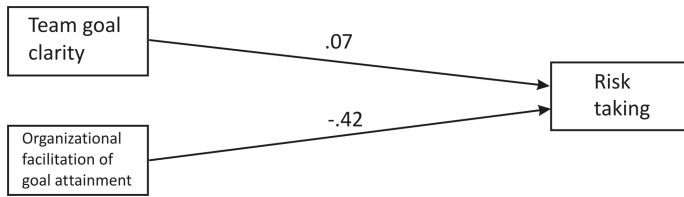
	Independent variables	Dependent variable Risk taking standard coefficient
Main effects	Team goal clarity	.07
	Organizational facilitation of goal attainment	-.42
$R^2$		.16
$F$		1.926

\*  $p < .05$  ; \*\*  $p < .01$

$N = 24$  teams

Though the studied conceptual model of risk taking did not reveal any significant relationship, it useful to remark that there would be a trend in the data. This trend can be seen in the  $p$ -level of the estimator as calculated by SPSS. When observing the results of the estimator for organizational facilitation of goal attainment in Appendix H, it can be concluded that there is a 7.4% of chance of falsely accepting the hypothesis (when one had predicted a negative relationship). It is reasonable to expect that an effect size of this (-.42) magnitude will be accepted in a larger sample, provided that the sample used here is a representative reflection of a larger sample of NPD teams (though this is not assured here). The model, based on table 7, is depicted in figure 11.

**Figure 11 Regression model predicting risk taking**



### 4.5 Overview of the results

The data collected in this study, has been used for testing hypotheses with regard to team goal aspects and two NPD relevant qualities, reflexivity and risk taking. An overall overview of the results is provided in order to give the reader the opportunity to see at a single glance what relationships have been studied, which hypotheses have been rejected and which hypotheses have been accepted. This study provides evidence for two out of twelve hypotheses. Table 8 provides the overview of the results.

**Table 8 Overview of the results**

Hypothesis 1	Participation in goal setting - Team reflexivity	+	Rejected
Hypothesis 2	Team goal clarity - Team reflexivity	+	Rejected
<i>Hypothesis 3</i>	<i>Team goal conflict - Team reflexivity</i>	-	<i>Supported</i>
<i>Hypothesis 4</i>	<i>Organizational facilitation of goal attainment - Team reflexivity</i>	+	<i>Supported</i>
Hypothesis 5a	Participation in goal setting - Team goal commitment - Team reflexivity	+	Rejected
Hypothesis 5b	Team goal clarity - Team goal commitment - Team reflexivity	+	Rejected
Hypothesis 5c	Team goal conflict - Team goal commitment - Team reflexivity	-	Rejected
Hypothesis 5d	Organizational facilitation of goal attainment - Team goal commitment - Team reflexivity	+	Rejected
<i>Hypothesis 6</i>	<i>Team goal clarity - Risk taking</i>	+	<i>Rejected</i>
<i>Hypothesis 7</i>	<i>Organizational facilitation of goal attainment - Risk taking</i>	+	<i>Rejected</i>
<i>Hypothesis 8a</i>	<i>Team goal clarity - Team potency - Risk taking</i>	+	<i>Rejected</i>
<i>Hypothesis 8b</i>	<i>Organizational facilitation of goal attainment - Team potency - Risk taking</i>	+	<i>Rejected</i>

'+' = positive proposed relationship ; '-' = negative proposed relationship

According to table 8, the results of this study provide evidence that team reflexivity is affected by two team goal aspects, team goal conflict and organizational facilitation of goal attainment, whereas no significant relationship was found for predicting risk taking. In addition to the results of this study, as depicted in table 8, a discussion regarding the results is given in the next chapter.

## 5. Discussion

In the preceding chapters, the research project as part of this graduation project, have been outlined. First, this discussion chapter outlines main findings, practical implications, and theoretical implications. Subsequently, research limitations, future research directions are discussed.

### 5.1 Main findings

Based on the research as just presented, which has been conducted in the field of innovation and team processes, several findings have been found. First of all, the strongest effect could be found for a positive relationship between organizational facilitation of goal attainment and team reflexivity. The second largest effect has been observed between team goal conflict and team reflexivity. Since, no more significant relationships has been found, it can be concluded that two out of twelve hypothesis can be supported.

Regarding the strongest effect, the following can be mentioned. Although it is not out of the question that these constructs may overlap each other, a plausible explanation can be found as well. If the organization facilitates in the attainment of the goals rather than hinders goal attainment it is plausible that team members feel supported and therefore may feel more responsible in their job than in a situation of a lack of organizational facilitation. Higher feelings of responsibility may lead to more discussion and reflection regarding objectives since feelings of responsibility impel people to behave proactively.

Regarding, the second largest effect, the data shows that the higher the team's mean score of goal conflict, the lower the extent of team reflexivity. Intuitively, this negative relation can be understood. Team goal conflict is created by having too many goals and/or even conflicting goals (Lee et al., 1991), judging the questionnaire items. Since the presence of many and conflicting goals may be emotionally distressful, people who experience goal conflict may spend more time resolving the stress caused by their conflicting goals rather than reflecting upon and communicating about goals, processes, and strategies may take place. A second explanation may be that increased goal conflict increases uncertainty about the priorities of the goals. When it is uncertain which goal (of all the conflicting goals) is most important to achieve, the team is unable to discuss about the choice of the strategies, since each goal is likely to need a different strategy. Therefore, conflicting goals may cause a diminished urge to reflect upon strategies. In the same line of argument, it is unlikely the team will discuss their goals since goals within the team conflict and first it needs to be known what (subset of) goal(s) to strive for. A third explanation may be that increased team goal conflict may lead to social loafing, which is the phenomenon of persons spending less effort to attain a goal when working in a group (Liden, Wayne, Jaworski, and Bennett, 2004). Indeed, team goal conflicts may decrease group

cohesiveness and increase individualistic orientation which in turn has been observed to cause social loafing (Liden et al., 2004).

Regarding team risk taking, organizational facilitation of goal attainment was found not to predict risk taking significantly. However, a totally unexpected and relatively large *negative* effect for organizational facilitation of goal attainment could be seen in the analyses. This might be seen as a trend in the data, which means that a probable negative relationship is present, though its significance could not be proved here. Although counterintuitive, a low degree of organizational facilitation of goal attainment in the teams of the sample, developed apparently a culture that promotes risk taking. Indeed, a culture of risk taking may probably not flourish in a suffocating environment such as one wherein much is facilitated. However, a lack of facilitation does not mean that psychological safety must be eroded. The fact is, research has showed the need for psychological safety as a prerequisite to promote risk taking (Baer and Frese, 2003).

Interesting is the observation that no relationship was found between team goal clarity and team reflexivity, although the regression analysis seems to provide, at least, a slight preference for a negative relationship. Although the relationship is not significant, a relative moderate negative effect size can be observed. In the same line of argument as stated earlier, this might be perceived as a trend in the data. Hence, if this is the sign of the relationship when it would be significant if a larger sample would have been used, it can be speculated that unclear team goals might stimulate team reflexivity. If this negative effect would be significant, this could be interpreted as team reflexivity being a tool for increasing clarity of the unclear goals through team reflexivity. However, remind that this speculation is based on an effect that is not found to be significant. Lastly, this trend means that the results of the study of Carter and West (1998) could not be replicated.

Team risk taking and team goal clarity seemed to be highly unrelated in our sample. Apparently, (un)clear goals sometimes lead to high risk taking and sometimes to low risk taking. A possible explanation for this result could not be found.

The other studied predictor for team reflexivity, participation of goal setting, showed the smallest non-significant effect. Apparently, the observations made by Carter and West (1998) which let the authors relate participative decision making and team reflexivity, could not be supported by the model studied in this report. A possible explanation could not be found.

Lastly, the lack of support regarding the mediating hypotheses will be discussed. As could be seen, neither team goal commitment nor team potency could be observed to act as a mediator. Regarding team potency, it is possible that, team efficacy instead of team potency act as a mediator. Team



potency is a more generalized form of team efficacy (De Jong et al., 2005) and it may be that team efficacy plays a larger role in NPD teams than team potency due to the specialized functions of each team member (see chapter 1). Therefore, teams may be more confident if the team perceives that the right functions are present in the team. This speculation is partially supported by Gully, Incalcaterra, Joshi, and Beaubien (2002) who state that “members of an engineering team might believe that they can design a specific new product (high team-efficacy) but might not believe that they can effectively produce, market, and sell the product (low potency)” (Gully et al., 2002, p. 820).

## 5.2 Practical implications / recommendations

Based on the results of the tested hypotheses, practical implications are provided in this part. First of all, it has to be said that it is hard to conclude that the results of the study can be generalized to other new product or process development teams. The reason for this is the small sample size, which is discussed more in-depth in paragraph 5.4. Therefore, the data only speaks for the participating teams in this study. However, if other kind of teams are similar to the teams in this sample, the results might be relevant for other types of teams. One can think of teams which set (design) goals as well and work in complex contexts such as teams of surgeons, teams of architectures, teams that execute large projects (e.g. infrastructure projects), etc.

The first contribution to the field is based on the first result, team goal conflict being negatively related to team reflexivity. Assuming that team reflexivity is a positive contributor to team performance, especially in complex teams as NPD teams, managers/leaders/entrepreneurs in innovative businesses need to balance team goals in such a way that goal conflict within the team cannot take place. This can be achieved concretely by developing cooperative goals (Tjosvold et al., 2004) instead of competitive goals. Cooperative goals, in turn, can be obtained by seeking “mutual goals, shared rewards, and common tasks” (Tjosvold et al., 2004, p. 546). Furthermore, a relating problem of goal conflict, having too many goals, can be solved by leaders/project managers and other kinds of ‘team bosses’ of innovative projects to put a maximum amount of goals. In paragraph 5.5, a future research direction is suggested concerning team goal conflicts. In sum, to achieve diminished team goal conflict, on the one hand cooperative goals, and on the other hand a maximum for the amount of team goals have to be introduced.

Secondly, there was found a positive relationship between organizational facilitation of goal attainment and team reflexivity. In addition, team reflexivity seemed to be beneficial for complex teams as NPD teams (Schippers et al., 2003). Therefore, this report advises corporate management of innovative organizations to revise company policies in order to stimulate an innovative climate where creativity and innovation goals are set and where these goals can be attained and where development teams can work together freely. This may be achieved by creating a climate for creativity and

innovation. A relevant, and psychometrically sound, measurement tool to measure an organization's climate for creativity and innovation that may be useful for this purpose is KEYS (Amabile et al., 1996). This measurement tool is able to measure the current situation regarding organizational support, encouragement of creativity, sufficient resources, etc. and may be a valid measurement tool in order to measure creativity climates within organizations. Eventually, these scales form the basis for the design of a creative environment to ensure NPD projects can be executed.

KEYS contains five conceptual categories of the work environment that influence innovation. To maximize innovative performance of the NPD teams, Amabile et al. (1996, p. 1166) suggest that the following conditions are relevant for improving the innovative environment. Everything that is necessary to achieve these conditions (A – E) can be seen as a practical recommendation. Note that description E, organizational impediments, need to be prevented instead of pursued!

*A. Organizational encouragement*

An organizational culture that encourages creativity through the fair, constructive judgement of ideas, reward and recognition for creative work, mechanisms for developing new ideas, and a shared vision of what the organization is trying to do.

*B. Supervisory encouragement*

A supervisor who serves as a good work model, sets goals appropriately, supports the work group, values individual contributions, and shows confidence in the work group

*C. Work group supports*

A diversity skilled work group in which people communicate well, are open to new ideas, constructively challenge each other's work, trust and help each other, and feel committed to they are doing.

*D. Challenging work*

A sense of having to work hard on challenging tasks and important projects.

*E. Organizational impediments*

An organizational culture that impedes creativity through internal political problems, harsh criticism of new ideas, destructive internal competition, an avoidance of risk, and an overemphasis on the status quo

It would be too far to mention all the detailed actions one can take to achieve the prescribed climate or creativity. It is up to the company how to fill the measures concretely.

### 5.3 Theoretical implications

The present study provides some novel contributions to the literature, in the field of new product and process development teams and goal setting theory next to the general findings described in the previous paragraph. For the first time, subscales from the GSQ scale have been combined with NPD relevant team qualities: team reflexivity and team risk taking.

First, the scales and items from the GSQ (which were originally stated at the individual level) were adapted to be able to measure team constructs. At the individual level, reliability analyses of the scales showed moderate to high reliability coefficients. The GSQ measures had the following reliability coefficients:

- .68 for organizational facilitation of goal attainment
- .78 for team goal conflict
- .80 for participation in goal setting
- .78 for team goal clarity

Therefore, the adapted GSQ scales were found appropriate to use in team level research. Secondly, for the first time there were found significant relations between scales from GSQ and scales for team reflexivity but not for the scale measuring team risk taking (measured at the team level).

Mediation analyses revealed no significant mediator role for team goal commitment or team potency in the resulting models. Other theoretical implications of this study involved replications<sup>7</sup> of correlation coefficients (at the individual level) found before. According to Appendix I, participation in goal setting seemed to be negatively correlated to goal conflict. This confirms the findings of Lee et al. (1991). Second, as in Lee et al. (1991), goal clarity is positively correlated to organizational facilitation of goal attainment. Lastly, organizational facilitation of goal attainment and goal conflict are both negatively and significantly correlated in both studies.

Furthermore, correlation coefficients (at the team level) not found before, are discussed. According to Table 3, team goal conflict is strongly and negatively correlated to team goal commitment ( $r = -.63, p < .01$ ). Team potency is positively related to participation in goal setting ( $r = .44, p < .05$ ). Team goal clarity is strongly positive related to team potency ( $r = .58, p < .01$ ). Lastly, team goal commitment is positively correlated to team reflexivity ( $r = .41, p < .05$ ). In sum, many contributions to the literature have been made in the form of correlations.

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<sup>7</sup> Note that the measures in this study measured team goal attributes, opposed to the measures in Lee et al. (1991) that measured individual goal attributes. Therefore, a full comparison is not valid.

Regarding differences in correlation coefficients between the measures at both the individual and the team level (Table 3 and Appendix I), some remarkable differences can be seen. Whereas team potency and team risk taking are not significantly correlated at the team level ( $r = .31$ ,  $p\text{-value} = .148$ ), these variables are correlated at the individual-level of measurement (see Appendix I,  $r = .34$ ,  $p < .01$ ). If this observation is added to the fact that teams answer highly similar, then it is likely that if there were more teams in the sample, team potency would have correlated to team risk taking. Lastly, there are no differences in significance regarding correlation coefficients with team reflexivity.

#### 5.4 Research limitations

The following limitations were applicable to this study. First, sample size and problems with power are discussed. Next, some biases such as common method bias and non-response bias are explained. Lastly, questionnaire problems are mentioned and discussed.

A potential problem regarding this study was the sample size, which has influence on the power (the probability to detect a true effect). The sample size in this study was 24 teams ( $N = 24$ ). According to Hair et al. (2006), a minimum of five cases per independent variable is required. However, 15 or 20 cases per independent variable are recommended (Hair et al., 2006) in order to be able to generalize (although the sample then still needs to be verified based on the extent representativeness). Since the largest proposed regression model contained 4 independent variables, a value of 24 teams equals a ratio of 6 cases per independent variable. Therefore, the minimum requirement of Hair et al. (2006) has been met. However, problems with the power still remain present. According to Hair et al. (2006), a regression model with 5 independent variables and a significance level ( $\alpha$ ) of 5% and a sample size of 20, a minimum of  $R^2 = .48$  can be found in 80% of the time, which is a large effect. Therefore, it can be concluded that our study was able to find comparable large effect sizes only.

Regarding methodological aspects of the data collection process, it can be concluded that data consisted only of subjective data. Cushman and Rosenberg (1991) recommends to collect both objective and subjective data instead of data from one type of source with reference to prevent common method bias. In this study, the possibility for common method problems were reduced by employing extensive validated measures (Spector, 1987).

Another question that raised, regarding the method, was the observation that in most cases a small subgroup of a team, that consisted of more than three members, had been questioned instead of the whole group. Actually, this would have been a problem (bias) if there is a systematic difference in the respondents' answers who have been participated opposed to the persons who have not participated and working in the teams. There is, however, no indication that this problem has involved in the

sample. Non-response bias, another kind of bias, could have played a role in our data due to a large (+/- 95%) group of *non-respondents* from the KIVI-NIRIA candidates. A last type of biased result, emerges when looking to the differences between the scores on the constructs for teams having a team leader/supervisor as one of the respondents, opposed to teams who had not included a team leader/supervisor in their response. Differences based on this difference were found on the variable risk taking.

Regarding the items used in the questionnaire, there was one item (question 21 in Appendix A) that contained the words “my boss”. This should have been “our boss”. The aim was to convert all individual level items into team level items indeed. Unfortunately, this objective was not completely achieved. Furthermore, some items (seemed afterwards) were not chosen well. Since there was a chance that teams that were active at the moment of questioning did not know certain answers on certain background variables, this could have biased the results. For example, one team responded “4” on question 15 (see Appendix A), about the reward of the team, because they did not know yet whether they were rewarded individually or as a group or even not at all. Another issue, same question about rewards, could have been biased as well (although there was no reason to assume this has been happened). This question asked about rewards without rewards being defined or asked what a reward is. Rewards can either be materialistic, monetary or even immaterialistic (e.g. pride, awards, etc). This distinction was not made, whereas it is possible that these categories caused the differences in answers because some persons may perceive feelings of pride whereas other people might not and yet, one member responds that he or she has been rewarded. Therefore, future studies which are interested in data about rewards, need to ask the form of the reward as well. Furthermore, to be able to be better assess the quality of the goals being set, future respondents should be asked to write down a specific team goal. Lastly, variability regarding team size was observed. Upon inquiry it appeared to be that development teams sometimes altered their size and/or composition. Future researchers should take this implication into consideration.

A last note involves the drawing of a sample of teams. This study did not pay attention to the possibility that groups with and without team leaders entered the study. As one can imagine, this may have biased the results. Indeed, team members could have been afraid to answer the questionnaire honestly, since their team leader could have inspected his or her . Moreover, the perception of the team leader regarding goal clarity and participation in goal setting, etc. could be so fundamental different that teams with and teams without leaders could not be seen as one common sample. Therefore, this study recommends to include only teams with or only teams without a team leader as the respondents, not both team types mixed in one study. A concrete problem of this kind can be seen in the difference in team risk taking between teams with and teams without a team leader as a respondent (see Appendix B).

### 5.5 Future research directions

Based on the research limitations of this study and based on the practical implications of this study, this part will suggest a couple of future research directions.

1. Study the more profound role of goal conflicts on team reflexivity. This can be done by conducting experiments in laboratories or role games or by a field study using questionnaires.
2. What kind of organizational facilitations *exactly* play a role in the effects on team reflexivity?
3. Replicate a part of this study by investigating a potential negative relation between organizational facilitation of goal attainment and team risk taking
4. Introduce other dependent variables such as information seeking behaviour or team viability in combination with team goal aspects.

### 5.6 Discussion research questions

The aim of this graduate project, which was twofold, was:

- (1) Describe the relation between team goal characteristics and two team behaviors, (a) team reflexivity and (b) team risk taking. Investigate the NPD team goal characteristics which have a potential contribution to (a) team reflexivity, and (b) risk taking. Furthermore, investigate the mechanisms (mediators) between team goal characteristics and team reflexivity and team risk taking.
- (2) Provide practical implications for the implementation of NPD team goal characteristics based on the obtained models.

Research objective 1 will be achieved by finding answers to the following research questions:

- Which team goal characteristics tend to contribute to the reflexivity in NPD teams?
- Which team goal characteristics tend to contribute to risk taking in NPD teams?
- Which team goal characteristic – team reflexivity relationship is partially mediated by team goal commitment?
- Which team goal characteristic – team risk taking relationship is partially mediated by team potency?

The answers on the research questions, based on the regression analyses are:

- Team goal conflict and organizational facilitation of goal attainment contribute to reflexivity in NPD teams
- There was no team goal characteristic which seemed to contribute to risk taking in NPD teams
- There was no partial mediating role detected for team goal commitment

- There was no partial mediating role detected for team potency

Lastly, both objectives have been achieved. Objective 1 is discussed in chapter 4. Objective 2 is discussed in chapter 5.2.

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## Appendix A: Questionnaire

### *Vragenlijst Teamprocessen bij ontwikkeling*



### Instructie (goed lezen!)

In dit document vindt u een vragenlijst over teamprocessen en teamdoelen. Let op: als u dit apprecieert, kunt u de resultaten na afloop van dit onderzoek ontvangen via e-mail. U kunt dan een e-mail sturen naar mij (zie e-mailadres verderop op deze pagina) met daarin uw verzoek om de resultaten. Het hoofddoel van mijn onderzoek is relaties aan te tonen tussen aspecten van teamdoelen en teamprocessen die gerelateerd zijn aan product- of procesontwikkeling.

Probeer de vragen in te vullen die betrekking hebben op **uw huidige team**. Indien u in meer dan één team werkzaam bent, probeer u dan te richten op het team dat gerelateerd is aan de ontwikkeling van een product of proces. Als dit laatste niet het geval is, vult u de vragenlijst in voor het team dat het meest gerelateerd is aan kenniswerk. Denk hierbij aan projectwerk, in teamverband organisatie van een activiteit, stuurgroep of iets dergelijks.

De vragenlijst kent geen goede of foute antwoorden. Het is verder niet nodig lang na te denken bij de keuze van een antwoord. Vul bij twijfel toch één antwoord in dat uw mening het dichtst nadert. Het is echter van belang dat u de vragenlijst serieus invult. Het invullen duurt ongeveer 10 tot 15 minuten. Het invullen kan geschieden door met pen uw keuze te maken. Dit doet u door de antwoorden op de multiple-choice vragen te omcirkelen of te onderstrepen zodat ik kan zien welk antwoord er is ingevuld.

De gegevens verkregen uit deze vragenlijst zullen **volledig anoniem** verwerkt worden. De gegevens zullen alleen gebruikt worden voor wetenschappelijk onderzoek. In verband met de validiteit van de vragenlijst worden de vragen in het Engels gesteld. Een Engelse woordenlijst is achteraan in het bestand ingevoegd. De antwoorden op de open vragen mag u natuurlijk in het Nederlands invullen. Mocht u vragen hebben omdat er iets in deze vragenlijst niet duidelijk is dan kunt u mij benaderen op mijn mobiele telefoon (06-28 55 61 53) of mijn e-mailadres ([K.J.A.v.Elst@student.tue.nl](mailto:K.J.A.v.Elst@student.tue.nl)). Het is immers in het belang van het onderzoek dat u goed begrijpt wat er gevraagd wordt. Dus als u iets niet begrijpt van de vragenlijst, **benader mij dan alstublieft**.

Tenslotte wil ik u van harte bedanken voor het invullen van deze vragenlijst!



Koen van Elst B.Sc.

Master student Innovation Management - Technische Universiteit Eindhoven





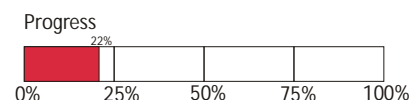
- 7) How many people approximately work for the company you work for?
1. Less than 249 people
  2. Between 250 – 499 people
  3. Between 500 – 999 people
  4. Between 1000 – 4999 people
  5. Between 5000 – 9999 people
  6. More than 10000 people
- 8) My function in the team is .....
- .....

The following questions are related to **your team**.

- 9) My team counts ..... persons.
- 10) What was your team creating / developing? .....
- .....
- .....
- 11) The project of my team lasts about ... days / weeks / months (delete where not applicable).
- 12) My team can best be described as a(n):
1. Product development team (for example a car, sports drink, software tool, etc)
  2. Process development team (for example a production process)
  3. Other: .....

B. The following set of questions is related to the **goals** of your team.

- 13) The goals of my team are:
1. Self set by the team members
  2. Assigned by a supervisor / team leader
  3. Mixed set (set both by the team members and he supervisor / team leader)
  4. Other:.....
- 14) The goals of my team are being set every:
1. Day
  2. Two or three times a week
  3. Every week
  4. Every month
  5. Other.....
- 15) When the goals of our team are attained,
1. The whole team will be rewarded
  2. The team members will be rewarded individually
  3. Other: .....



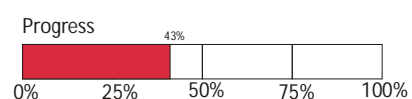
16) The innovation we developed can best be described as a(n):

1. Radical innovation (new technology, new market)
2. Incremental innovation (extension of existing product or process)
3. Something in between radical and incremental innovation
4. Other:.....

The following questions have to be answered **how often** the statement is applicable to your team: (1)

nearly never – (5) nearly always.

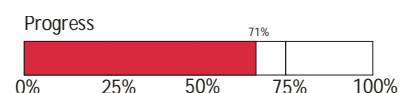
	Nearly never 1	Sometimes 2	Neutral 3	Often 4	Nearly always 5
17) The goals I have on this job are challenging but reasonable (neither too hard nor too easy).	17) 1	2	3	4	5
18) Company policies here help rather than hurt goal attainment.	18) 1	2	3	4	5
19) Work teams in this company work together to attain goals.	19) 1	2	3	4	5
20) This company provides sufficient resources (e.g. time, money, equipment, coworkers) to make goal setting work.	20) 1	2	3	4	5
21) During performance appraisals interviews, my boss schedules a follow-up meeting so that we can discuss progress in relation to the goal.	21) 1	2	3	4	5
22) The team has too many goals on this job (the team is too overloaded).	22) 1	2	3	4	5
23) Some of the team's goals conflict with each other.	23) 1	2	3	4	5
24) The team is given incompatible or conflicting goals by different people (or even by the same person).	24) 1	2	3	4	5
25) The team has unclear goals on this job.	25) 1	2	3	4	5
26) The team's job goals lead the team to take excessive risks	26) 1	2	3	4	5
27) The team's job goals serve to limit rather than raise goal attainment.	27) 1	2	3	4	5
28) The goals the team has on this job leads the team to ignore other important aspects of its job.	28) 1	2	3	4	5
29) The goals the team has on this job focus only on short-range accomplishment and ignore important long-range consequences.	29) 1	2	3	4	5



	Nearly never 1	Sometimes 2	Neutral 3	Often 4	Nearly always 5
30) The team's boss lets the team participate in the setting of its goals.	30) 1	2	3	4	5
31) The team's boss is supportive with respect to encouraging the team to reach its goals	31) 1	2	3	4	5
32) The team's boss lets the team has some say in deciding how the team will go about implementing its goals.	32) 1	2	3	4	5
33) The team understands exactly what it is supposed to do on its job.	33) 1	2	3	4	5
34) The team has specific, clear goals to aim for on its job.	34) 1	2	3	4	5
35) If the team has more than one goal to accomplish, the team knows which ones are most important and which are least important.	35) 1	2	3	4	5
36) The team I work with encourage me to attain our goals	36) 1	2	3	4	5

C. The following set of questions needs to be answered whether or not you agree with the statement. Again, these questions are about aspects of team processes and goals.

	Strongly disagree 1	Moderate disagree 2	Neutral 3	Moderate agree 4	Strongly agree 5
37) The technical goals of our team remain stable through a (development) project.	37) 1	2	3	4	5
38) The design goals of our team remain stable through a (development) project.	38) 1	2	3	4	5
39) The vision of a project remains stable through a (development) project.	39) 1	2	3	4	5
40) It's hard to take the goals of our team seriously.	40) 1	2	3	4	5
41) Quite frankly, I don't care if I achieve the team goals or not.	41) 1	2	3	4	5
42) I am strongly committed to pursuing the team goals.	42) 1	2	3	4	5
43) It wouldn't take much to make me abandon the team goals.	43) 1	2	3	4	5
44) I think the team goals are good goals to shoot for.	44) 1	2	3	4	5
45) Our team has confidence in performing the job requirements.	45) 1	2	3	4	5
46) Our team believes it can become unusually good at self-managing.	46) 1	2	3	4	5
47) Our team expects to be known as a high-performing team.	47) 1	2	3	4	5
48) Our team feels it can solve any problem it encounters.	48) 1	2	3	4	5
49) No task is too tough for our team.	49) 1	2	3	4	5

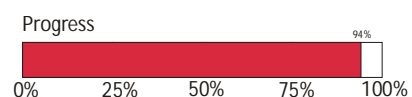


**TU/e Appendices**

	Strongly disagree	Moderate disagree	Neutral	Moderate agree	Strongly agree
	1	2	3	4	5
50) Our team can get a lot done when it works hard.	50) 1	2	3	4	5
51) I cannot accomplish my tasks without information or materials from other members of my team.	51) 1	2	3	4	5
52) Other members of my team depend on me for information or materials needed to perform their tasks.	52) 1	2	3	4	5
53) Within my team, jobs performed by team members are related to one another.	53) 1	2	3	4	5

D. The following set of questions is about team behavior. Again the questions need to be answered whether you (dis)agree the statements / questions.

	Strongly disagree	Moderate disagree	Neutral	Moderate agree	Strongly agree
	1	2	3	4	5
54) My team investigated and observed the context and the progress of our project (e.g. task performance strategies, goals, project requirements, the organizational context, etc.).	54) 1	2	3	4	5
55) My team adjusted its task performance strategies in response to changes in the context and progress of the project.	55) 1	2	3	4	5
56) My team spent an adequate amount of time considering the likely consequences of its task activities (e.g. considerations regarding usability of the product, compatibility with other products, cost, etc.).	56) 1	2	3	4	5
57) Strategies and work approaches chosen were later checked for their appropriateness.	57) 1	2	3	4	5
58) My team learned from its experiences.	58) 1	2	3	4	5
59) Most people in our team are willing to take risks.	59) 1	2	3	4	5
60) The team encourages team members to try new things.	60) 1	2	3	4	5
61) It is known that our performance is better than that of other teams.	61) 1	2	3	4	5
62) We think our team deserves a good evaluation of our supervisor.	62) 1	2	3	4	5
63) Compared to the requirements, our team obtains good results.	63) 1	2	3	4	5



	Strongly disagree	Moderate disagree	Neutral	Moderate agree	Strongly agree
	1	2	3	4	5
64) There are few, if any, complaints about the quality of our team's work.	1	2	3	4	5

The last set of questions is about the team's information sources. These questions need to be answered whether you use the sources (1) never or (5) once a week.

65) How often do you use the following sources of information regarding your team project.	Never	Once a year	Once a quarter	Once a month	Once a week
	1	2	3	4	5
a) Relevant periodicals (tijdschrift)	1	2	3	4	5
b) Company library	1	2	3	4	5
c) Company intranet	1	2	3	4	5
d) Internet	1	2	3	4	5
e) Databases	1	2	3	4	5
f) Superiors	1	2	3	4	5
g) Peers / Colleagues	1	2	3	4	5
h) Internal documents (originating within the organisation)	1	2	3	4	5
i) Consultants/experts hired by organization	1	2	3	4	5
j) Other persons not employed by the organization	1	2	3	4	5

Any comments:

*Write down your comments here please*

You have finished the questionnaire

**Bedankt voor uw medewerking!**  
*Thanks for your cooperation!*

## English words

### A

<b>to Abandon</b>	Afzien van
<b>Accomplishment/ to accomplish</b>	Voltooing, voltooiën
<b>Adequate</b>	Voldoende
<b>Adjusted</b>	Aangepast
<b>to Aim for</b>	Nastreven
<b>Applicable</b>	Van toepassing
<b>Approaches</b>	Benaderingen, methodes
<b>Appropriateness</b>	Geschiktheid
<b>Approximately</b>	Ongeveer
<b>Assigned</b>	Opgelegd
<b>Attainment/ to attain</b>	Bereiking, bereiken
<b>Automotive</b>	Automobiel

### C

<b>Challenging</b>	Uitdagend
<b>Committed/ to Commit</b>	Zich verplichten
<b>Compatibility</b>	Verenigbaarheid
<b>Complaints</b>	Klachten
<b>Confidence</b>	Vertrouwen
<b>Considering</b>	Rekening houdend met
<b>Counts/ to count</b>	Tellen

### D

<b>Described</b>	Beschreven
<b>to Deserve</b>	Verdienen
<b>Developing / to develop</b>	Ontwikkelen

### E

<b>Encounter</b>	Tegenkomen
<b>Encouraged</b>	Aangemoedigd
<b>Encouraging</b>	Bemoedigend
<b>Engineer</b>	Ingenieur, technicus
<b>Equipment</b>	Uitrusting, benodigheden
<b>Excessive</b>	Buitensporig, overmatig

### F

<b>Follow-up</b>	Vervolg
<b>Frankly</b>	Eerlijk

### G

<b>Gender</b>	Geslacht
<b>Goal</b>	Doel

### I

<b>Ignore</b>	Negeren
<b>Implementing</b>	Verwezenlijken
<b>Incompatible</b>	Overenigbaar, tegenstrijdig

### L

<b>Likely</b>	Waarschijnlijk
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### M

<b>Manufacturing/ to manufacture</b>	Fabriceren, produceren, vervaardigen
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### O

<b>Overloaded</b>	Overbelast
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### P

<b>Policies</b>	Beleid
<b>Progress</b>	Voortgang
<b>Pursuing</b>	Nastreven, trachten te bereiken

### R

<b>Reasonable</b>	Redelijk
<b>Remain</b>	Blijven
<b>Requirements</b>	Eisen, vereisten
<b>Resource</b>	Middel

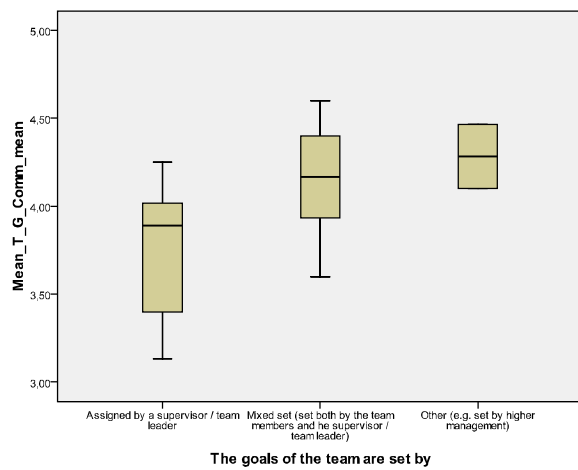
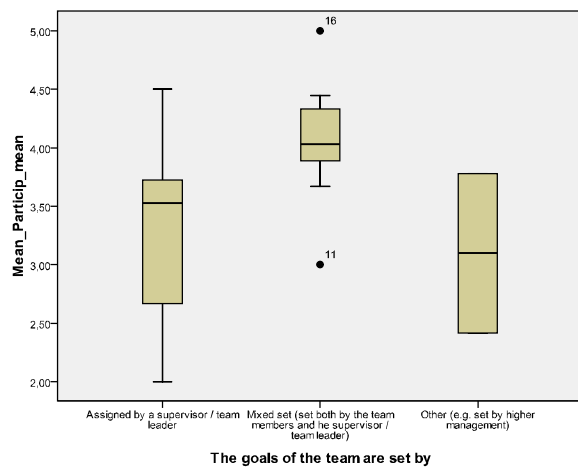
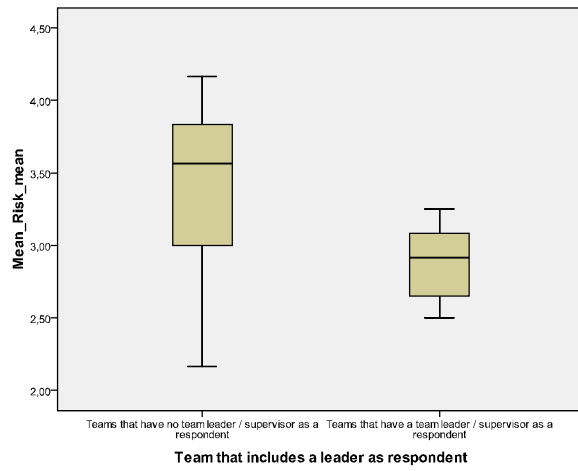
### S

<b>Schedule/ to schedule</b>	Planning, plannen
<b>to Shoot for Staff</b>	Zich richten op Staf, ondersteuning
<b>Sufficient</b>	Voldoende
<b>Supportive</b>	Ondersteunen, helpend
<b>Supposed</b>	Verondersteld

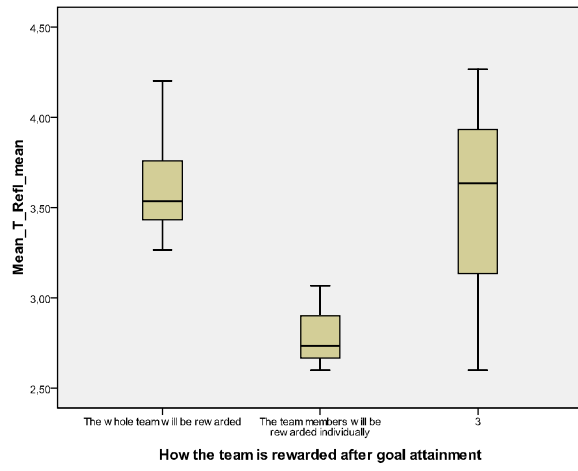
### U

<b>Usability</b>	Bruikbaarheid
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## Appendix B Differences between team categories







## Appendix C: Testing the influence of control variables on team reflexivity

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,491 <sup>a</sup>	,241	,161	,43699

a. Predictors: (Constant), The duration of the project of the team in days, The size of the team in number of persons

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,152	2	,576	3,017	,073 <sup>a</sup>
	Residual	3,628	19	,191		
	Total	4,780	21			

a. Predictors: (Constant), The duration of the project of the team in days, The size of the team in number of persons

b. Dependent Variable: Mean\_T\_Refl\_mean

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3,721	,233		15,979	,000		
	The size of the team in number of persons	-,063	,029	-,554	-2,188	,041	,622	1,607
	The duration of the project of the team in days	,001	,001	,564	2,225	,038	,622	1,607

a. Dependent Variable: Mean\_T\_Refl\_mean

## Appendix D: Regression results for predicting team reflexivity

Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,692 <sup>a</sup>	,480	,370	,38161

a. Predictors: (Constant), Mean\_Particip\_mean, Mean\_T\_G\_Clar\_mean, Mean\_T\_G\_Confl\_mean, Mean\_Org\_Fac\_mean

b. Dependent Variable: Mean\_T\_Refl\_mean

ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,549	4	,637	4,377	,011 <sup>a</sup>
	Residual	2,767	19	,146		
	Total	5,316	23			

a. Predictors: (Constant), Mean\_T\_G\_Clar\_mean, Mean\_Particip\_mean, Mean\_T\_G\_Confl\_mean, Mean\_Org\_Fac\_mean

b. Dependent Variable: Mean\_T\_Refl\_mean

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t		Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	4,070	1,003		4,059	,001	1,972	6,169		
	Mean_Org_Fac_mean	,441	,164	,530	2,691	,014	,098	,784	,705	1,417
	Mean_T_G_Confl_mean	-,366	,170	-,420	-2,158	,044	-,722	-,011	,725	1,380
	Mean_Particip_mean	-,031	,123	-,047	-,255	,802	-,289	,226	,802	1,247
	Mean_T_G_Clar_mean	-,258	,150	-,325	-1,721	,102	-,573	,056	,767	1,303

a. Dependent Variable: Mean\_T\_Refl\_mean

## Appendix E: Mediation analysis team reflexivity

### Step 1

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4,664	,418		11,154	,000		
	Mean_T_G_Confl_mean	-,452	,159	-,517	-2,832	,010	1,000	1,000

a. Dependent Variable: Mean\_T\_Ref\_mean

### Step 2

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	5,142	,305		16,839	,000		
	Mean_T_G_Confl_mean	-,437	,116	-,625	-3,751	,001	1,000	1,000

a. Dependent Variable: Mean\_T\_G\_Comm\_mean

### Step 3

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1,455	,982		1,481	,153		
	Mean_T_G_Comm_mean	,510	,243	,408	2,097	,048	1,000	1,000

a. Dependent Variable: Mean\_T\_Ref\_mean

### Step 4

ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,484	2	,742	4,066	,032 <sup>a</sup>
	Residual	3,832	21	,182		
	Total	5,316	23			

a. Predictors: (Constant), Mean\_T\_G\_Confl\_mean, Mean\_T\_G\_Comm\_mean

b. Dependent Variable: Mean\_T\_Ref\_mean

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3,766	1,582		2,381	,027		
	Mean_T_G_Comm_mean	,175	,296	,140	,589	,562	,610	1,639
	Mean_T_G_Confl_mean	-,375	,207	-,430	-1,811	,084	,610	1,639

a. Dependent Variable: Mean\_T\_Ref\_mean

## Appendix F: Mediation analysis organizational facilitation of goal attainment

### Step 1

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1							
	(Constant)	3,288	,432		7,615	,000	
	Mean_Org_Fac_mean	,230	,133	,345	1,725	,099	1,000

a. Dependent Variable: Mean\_T\_G\_Comm\_mean

## Appendix G: Testing the influence of control variables on risk taking

ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,210	2	,105	,321	,729 <sup>a</sup>
	Residual	6,219	19	,327		
	Total	6,430	21			

a. Predictors: (Constant), The duration of the project of the team in days, The size of the team in number of persons

b. Dependent Variable: Mean\_Risk\_mean

## Appendix H: Regression results for predicting risk taking

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,394 <sup>a</sup>	,155	,075	,52114

a. Predictors: (Constant), Mean\_T\_G\_Clar\_mean, Mean\_Org\_Fac\_mean

b. Dependent Variable: Mean\_Risk\_mean

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,046	2	,523	1,926	,171 <sup>a</sup>
	Residual	5,703	21	,272		
	Total	6,750	23			

a. Predictors: (Constant), Mean\_T\_G\_Clar\_mean, Mean\_Org\_Fac\_mean

b. Dependent Variable: Mean\_Risk\_mean

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4,248	,728		5,837	,000		
	Mean_Org_Fac_mean	-,397	,214	-,424	-1,855	,078	,771	1,296
	Mean_T_G_Clar_mean	,066	,205	,074	,324	,749	,771	1,296

a. Dependent Variable: Mean\_Risk\_mean

## Appendix I: Correlation table of measures at the individual level

	1	2	3	4	5	6	7	8	9	10
1. Organizational facilitation of goal attainment	<b>.68</b>									
2. Team goal conflict	-.26*	<b>.78</b>								
3. Participation in goal setting	.16	-.41**	<b>.80</b>							
4. Team goal clarity	.44**	-.20	.16	<b>.78</b>						
5. Team goal commitment	.33*	-.44	.30**	.29**	<b>.71</b>					
6. Team potency	.17	.00	.26*	.43**	.21	<b>.61</b>				
7. Team reflexivity	.41**	-.39**	.22	.05	.31**	-.02	<b>.73</b>			
8. Risk taking	-.19	-.08	.13	-.02	.03	.34**	-.09	<b>.70</b>		
9. Team size	-.04	-.13	-.14	-.26	-.05	-.22	.04	-.10	<b>N.P.</b>	
10. Team tenure	.06	.05	-.22	.19	-.03	.10	.15	-.07	.65**	<b>N.P.</b>

Reliability of the scales (Cronbach's  $\alpha$ ), as measured at the individual level ( $n = 76$ ), are presented in bold printing on the diagonal. N.P.= Not possible  
Correlation coefficients are based on individual scores ( $N = 76$ ).

\* $p < .05$ ; \*\* $p < .01$