

KU LEUVEN

FACULTEIT PSYCHOLOGIE EN  
PEDAGOGISCHE WETENSCHAPPEN

CENTRUM VOOR PROFESSIONELE OPLEIDING EN  
ONTWIKKELING EN LEVENSLANG LEREN

**INVESTIGATING TASK COMPLEXITY AND TEAM  
LEARNING IN SOCIAL CARE TEAMS IN FLANDERS**

A multilevel analysis

Master's thesis submitted for the  
degree of Master of Science in de  
pedagogische wetenschappen by

**Hanne Blockx**

Supervisor:  
Prof. Dr. Filip Dochy  
With the collaboration of:  
Anne Boon

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## Summary

**Hanne, Blockx**, Investigating task complexity and team learning in social care teams in Flanders: A multilevel analysis.

Master thesis presented to obtain the degree of: Master in de Pedagogische Wetenschappen  
June 2014

Promotor: Prof. dr. Filip Dochy

Supervisor: Anne Boon

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**Purpose** – During the past 30 years research has been made about teams, teamwork and team learning. This study is in line with earlier research into team learning in student teams, military teams, police and firemen teams, and so on. The purpose of this article is to replicate the Team Learning Beliefs and Behaviours (TLB&B) model into social care teams in Flanders. This paper aims at researching how team's interpersonal beliefs and its teams learning behaviours, such as construction, co-construction and constructive conflict, influence the building and maintaining of mutually shared cognition in the collaborative learning environment, and in turn leading to a higher team effectiveness. Additionally, task complexity was added to this model. Two dimensions of task complexity are brought into the equation: instability and unreliability. Furthermore, we investigate if the team's working context, residential or ambulant, and the field of operation, the care of disabled persons or child welfare, influence the different dimensions of task complexity and the TLB&B model.

**Design/methodology/approach** – The validated TLB&B questionnaire and a newly developed task complexity scale were used to measure the constructs. 726 persons were questioned. Altogether, these individuals work in 120 social care teams. Stepwise multi-level regression analyses and an analysis of variance were used to analyse the data gathered.

**Findings** – The results show that the TLB&B model applies to the data and analyses confirm that task complexity is a valuable parameter added to the model.

**Originality/value** – This study validates the TLB&B model in a Flemish social care context. Additionally, task complexity is added as a predictor for team learning behaviours and team effectiveness. Furthermore, a multilevel-approach was used for that reason that individual team members are nested in teams. In this way, the context is displayed in a realistic manner.

**Keywords** – Team learning, Collaborative learning, Mutually shared cognition, Team effectiveness, Beliefs about the interpersonal context, Task complexity

**Paper type** – Research paper





## Acknowledgements

I wanted to propose my thesis on task complexity and team learning in the domain of social care, because of my previous education and experiences and my wish to learn more about teams, teamwork and team learning. Carrying out empirical research would be the final stage of my training. Investigating this subject matter and, of course, writing this article has been a challenging and most valuable experience. I want to thank a few persons. Without their assistance and support, I would not have been able to present this article.

First, I want to thank promoter, prof. dr. Filip Dochy. He offered me the chance to develop my own thesis and gave me the freedom to work autonomously. At the same time, I received feedback at the right moments.

I also want to show my gratitude to Anne Boon, my assistant in the surf. She guided me through the process of writing this master paper: giving feedback, keeping me on track and motivating me to finish this article as it is presented right now.

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Finally, I render my parents and my sister a memorable thank you. They have always supported me whatever the challenge I take on. They give me all the opportunities to fully develop myself and will do in the future. Without them I would not be the person that I am today. Thank you mom, dad and sis!



## Approach

I worked out a proposal for a paper about team learning in the social care domain, because of my previous education and my current interest in teams. After discussing this with Prof. Dr. Filip Dochy and research supervisor Anne Boon, task complexity was added, since, on the one hand the inquiry is a replica study of the TLB&B model in another context and on the other, task complexity would be a valuable extension and eventually, this way the inquiry would differ from previous studies.

After setting the goals, the whole research cycle was designed. First, I studied relevant literature in order to develop research questions and to put forward hypotheses. I also paid attention to the way of referencing, following the APA-manual. Based on this section I set up an adequate method: research setting, participating respondents, instrument, analyses. After setting the theoretical frame, I started preparing the questionnaire. Since it partially involved a replica study, the validated TLB&B questionnaire was used and expanded with a scale for task complexity, which I developed with my supervisor. Also a section for demographic information about the context, sector, etc. was added (see Appendix I). I paid a lot of attention to how to finish such a diverse questionnaire and how to get into contact with teams. Therefore, I consulted the social map of Flanders. Next, I contacted organisations that were asked to send the necessary data. I set myself and the organisations deadlines to keep the pace and to collect reliable information. Moreover, I wanted as many teams as possible, therefore I negotiated with schools so that their students could collect extra data. In return I offered to lead interactive workshops on the importance of team learning in the social care domain. In the end, the data were processed to a workable collection, for example by calculating scale scores.

The theoretical method section shows we decided to do multilevel analyses, supplemented with ANOVA's. Initially, confirmatory and exploratory factor analyses were conducted to make sure the structure of the questionnaire is reflected in the data. Because the research method required a multilevel approach, I calculated Rwg scores. Next, I analysed the data according to the multilevel scripts of the research of Boon, Raes, Kyndt and Dochy (2013), where I made adjustments for this study, such as adding the four dimensions of task complexity instead of self-efficacy. For the ANOVA's, my supervisor could provide me with a basic scripts that I further adjusted to my data. After performing these analyses, I worked out the results and interpreted the data to write the discussion and conclusion section.

Finally, I evaluated the study to be able to propose suggestions for further research. At last, it is my wish to publish this article in the *Journal of Small Group Research* because this study is in line with previous research published in this journal.



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## **Introduction**

During the past 30 years, there has been an increased use of teams in the field of health care due to the continuously changing and dynamic environment (Bower, Campbell, Bojke, & Sibbald, 2003; Johnson, Top, & Yukselturk, 2011; Senge, 1990). According to Xyrichis and Ream (2008) teamwork in healthcare involves a dynamic process of two or more multidisciplinary professionals, who are complementary, share common goals and work together towards assessing, planning, and evaluating patient care, which is similar in the social care context. The dependency on such team-based structures in today's uncertain organisational environments enables researchers to comprehend the factors that ensure effective teamwork (Mathieu, Maynard, Rapp, & Gilson, 2008; Veestraeten, Kyndt, Decuyper, & Dochy, 2014; Zaccaro, Ely, & Shuffler, 2008). Moreover, recent studies show that one of the preconditions for effective teamwork is the amount that team members engage in team learning (Chan, Lim, & Keasberry, 2003; Dochy, Laurijssen, & Kyndt, 2011; Veestraeten et al., 2014). However, to activate team learning processes it is not enough putting people together (Nouwen, Decuyper, & Put, 2012; Van den Bossche, Gijsselaers, Segers, & Kirschner, 2006). Qualitative and communicative interactions are required as well as actions between the team members in a context of shared responsibilities in order to reach team purposes (Cohen & Bailey, 1997; Decuyper, Dochy, & Van den Bossche, 2010; Edmondson, 1999). Team learning enhances efficient interaction and coordination as well the enablement of the team to be innovative and solve problems in a continuously changing environment, which in turn lead to a higher effective performance (Chan et al., 2003; Dochy et al., 2011; Goh, Goodman, & Weingart, 2013; Tjosvold, Poon, & Yu, 2005; Veestraeten et al., 2014; Zaccaro et al., 2008). A possible way a team could benefit from team learning processes is when dealing with task complexity. Managing task complexity is one of the largest challenges for small groups (Giordano & George, 2013). Prior research shows that task complexity moderates the relationship between goals and performance at the individual level (Wood, Mento, & Locke, 1987). Similarly, Narghang et al. (2013) stress that task complexity may be a boundary condition for goal-team performance relationship and expect that task complexity influences the amount in which team members engage in coordination activities. Taking all this into account, the purpose of this article is to replicate the model Team Learning Beliefs and Behaviours (TLB&B) proposed by Van den Bossche et al. (2006) in the context of social care teams. It is our aim to shed light on the inputs, processes and outcomes of team learning in social care teams and determine whether lessons learnt from earlier

research on military teams, firemen and police teams, etc., in organisational settings can be transferred to a social care context (Boon, Raes, Kyndt, & Dochy, 2013; Ortega, Sa'nchez-Manzanas, Gil, & Rico, 2013; Veestraeten et al., 2014). In addition, the effect of task complexity on team learning and team effectiveness will be examined, by focusing on following dimensions: time pressure, multiplicity in outcomes, instability and unreliability of the task (Liu & Li, 2012).

## **Theoretical Background**

### **Social Care Teams**

Senge (1990), Salas, Burke, and Cannon-Bowers (2000) state that an organisation should be a 'learning organisation' in order to cope with the complex environment teams have to deal with. Social care teams have to deal with various actors like procedures, client needs, different client perspectives, etc., imposed by the organisation itself, government, parents, etc., which creates a dynamic, but at the same time a complex environment (Leichtman, 2008; McKenzie, 2011). The goal of a social care team is to come to a comprehensive understanding of the client's difficulties (Bartolo, Dockrell, & Lunt, 2001). A team is recommended to never apply rigidly any procedure or guideline, because they deal with very specific cases and clients (Leichtman, 2008; McKenzie, 2011). This means that teams are confronted with changes and uncertainty and, as a result, must engage in learning activities to understand their environment and their clients in order to reach effective self-management and team process improvement (Edmondson, 1999). For these reasons it could be beneficial for the team to engage in collaborative learning environments in order to build and maintain a mutually shared cognition (Bartolo, et al., 2001; Kirschner, Paas, & Kirschner, 2011; Van den Bossche et al., 2006). Compared to working individually, teamwork has proven to lead to higher task effectiveness and improved mental health of team members (Bower et al., 2003). Also, Meltzer et al. (2010) argue that teams are an integral component of quality improvement efforts in health care organisations and stress that social relationships in this context are valuable resources, which can be used to improve the information flow and influence the desired outcomes. Therefore, team based organisational structures can be a lever that respond effectively to this complex environment, which in their turn can stimulate team members to learn as a team (Zaccaro et al., 2008). As a consequence, it can be stated that team learning is important for social care teams and organisations. For teams: They can learn how to work together effectively. For organisations: They can manage their nonstop changing and complex



environment (Dochy et al., 2011; Goh et al., 2013; Zaccaro et al., 2008). In this study, the distinction will be explored between teams that work with disabled persons and teams active in the child- or youth welfare. We aim at discovering differences in the population on the numerous measured constructs. A second distinction explores the difference between ambulant and residential teams in the social care domain.

### **Definition of ‘a Team’**

Cohen and Bailey (1997) defined “*a team as a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an social entity embedded in one or more larger social systems.*” (p. 241). They also emphasise the notion of boundary crossing interactions and relationships are managed by their team members across various organisational and team boundaries (Cohen & Bailey, 1997). This brings us back to Senge’s idea that teams are the link between individual and organisational learning: “*It’s where the rubber meets the road*” (Senge, 1990, p. 10). Beside this definition, Salas et al. (2000) mentioned two extra characteristics of a team: team interaction and development of a shared vision. The development of a shared vision is a collection of individual knowledge bases, which are brought together and in their turn form a shared vision, by learning and reconstructions of their own conceptions through collaboration and team interaction (Robertson, 2007). Given the descriptions above and based on the article of Boon et al. (2013), following team characteristics are recognised: interdependence, shared responsibility, see themselves as a team, boundary crossing and a development of a shared mental model (Boon et al., 2013; Cohen & Bailey, 1997; Salas et al., 2000).

There are different kinds of teams, each type having typical characteristics. Therefore, Hollenbeck, Beersma, and Schouten (2012) outlined a taxonomy of definitions of different team types. One type is an ongoing project team, which has relatively stable membership and solves problems, makes plans or decisions, or interacts with clients or customers (Devine, Clayton, Philips, Dunford, & Melner, 1999). This kind of team can be recognised in social care teams, which is our focus in this study.

### **Team Learning Model**

One of the objectives of the present study is to replicate the TLB&B model of Van den Bossche et al. (2006) like it is done in earlier research (Boon et al., 2013; Veestraeten et al., 2014). This describes team learning as a social process of building mutually shared cognition

among team members in order to cooperate more effectively. Decuyper et al. (2010) enumerate 30 definitions of team learning. This study uses the definition by Van den Bossche et al. (2006): “Building and maintaining of mutually shared cognition, leading to increased perceived team performance” (p. 490). Team learning is seen as a process as well as an outcome (van Offenbeek, 2001). When taking a closer look to the model, we notice a team process that is built up by four accessories of variables (see Figure I). First, the social context of the team is shown, which Van den Bossche et al. (2006) noted as the beliefs about the interpersonal context. This means that the context influences the emergence of team learning behaviours (Boon et al., 2013; Van den Bossche et al., 2006). These team learning behaviours subsequently influence the development of mutually shared cognition (Boon et al., 2013; Van den Bossche et al., 2006). Finally, the developed mutually shared cognition directly contributes to a team’s effectiveness (Boon et al., 2013; Van den Bossche et al., 2006).

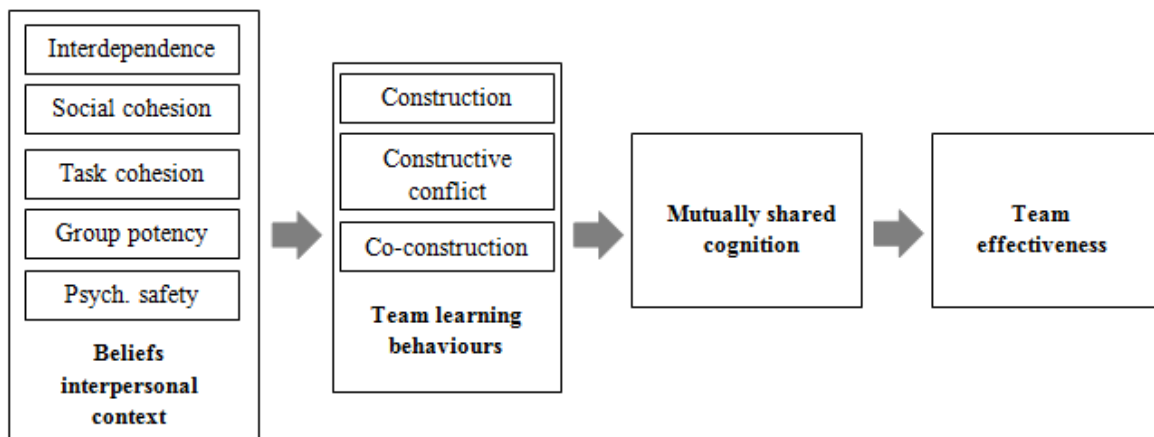


Figure 1 Team Learning Beliefs and Behaviours (Van den Bossche et al., 2006)

The first research question is based on the model mentioned above: examining the relationship between the beliefs in the interpersonal context and team learning behaviours. Secondly, we test the relationship between team learning behaviour and the development of mutually shared cognition (Geleyn, Dochy, & Decuyper, 2010). If a correlation shows, we further want to check whether this, in turn, influences team effectiveness. In other words, does team learning influence team effectiveness and is this effect mediated by mutually shared cognition?

In the section below, we first describe and hypothesise team learning as processes as well as outcomes. Next, task complexity and its various dimensions will be defined and further hypothesised.

## **Team learning: processes and outcomes.**

### ***Three team learning behaviours or processes.***

In this section, the different types of team learning behaviour are described (Van den Bossche et al., 2006). According to Edmondson (1999) team learning behaviour refers to the actual team activities, such as experimentation, giving feedback, sharing information. These behaviours are significant predictors for team effectiveness. Savelsbergh, van der Heijden, and Poell (2009) also report a positive relationship between team learning behaviour and team performance. Besides, poor interaction dynamics and greater process losses would decrease the team effectiveness (Hambrick, Cho, & Chen, 1996; Martins, Schilpzand, Kirkman, Ivanaj, & Ivanaj, 2012). Below, a description about construction and the difference with co-construction is presented. Secondly, constructive conflict will be described.

### ***Construction and co-construction.***

‘Sharing’ or ‘construction’ is the process of communication between team members, which ensures that knowledge, competencies, skills, opinions or creative thoughts arise that previously were not present, or which team members were not aware of (Decuyper et al., 2010; Van den Bossche et al., 2006). De Vries, Van den Hooff, & De Ridder (2006) define this sharing of information as “*the process where individuals mutually exchange their (tacit and explicit) knowledge and jointly create new knowledge*” (p. 116). This implies both bringing (or providing) and getting (or collecting) knowledge through different knowledge share behaviours (De Vries et al., 2006). So, when people learn as a group, they participate in a process in which each individual team member gains new understandings, knowledge and shares insights with other group members (Ellis et al., 2003). Van den Bossche et al. (2006) take it a step further and talk about ‘co-construction’, which is the process of mutually and continually refining and modifying meaning. This happens when one or more team members give their opinion to the others’ and consequently the other members listen and try to understand, refine and modify what is said (or not said) and so on (Baker, 1994; Boon et al., 2013; Van den Bossche et al., 2006). In other words, members build and maintain a social construction of an interpretation of a situation or a problem on which they agree at that moment (Geleyn et al., 2010; Van den Bossche et al., 2006). Wilson, Goodman, and Cronin (2007) stress that through the processes of (co-)construction there is more than only shared and obtained information, also new experiences, expertise and insights can emerge.

### *Constructive conflict.*

To come to fundamental changes in thinking and behaviour of team members and the team as a whole, there is need for constructive conflict (Van den Bossche et al., 2006). This is a conflict or a grounded discussion, which is the result of open communication in the team and the expliciting of different opinions by the team members (Tjosvold & Yu, 2007; Van den Bossche et al., 2006). A conflict is considered constructive when it leads to a kind of temporary agreement (Van den Bossche et al. 2006), but can be experienced as unpleasant, in contrast to the more pleasant learning process of (co-)construction (Geleyn et al., 2010). Tjosvold et al. (2005) discovered a positive effect of a cooperative conflict and a negative effect of a competitive conflict on performance. Boon et al. (2013) argue in this context that team members always take a risk when they respond to a disagreement, namely that there is a chance that the conflict will be ‘un-constructive’.

Even though ‘co-construction’ and ‘constructive conflict’ are described as two separate processes (Kasl, Marsick, & Dechant, 1997; Van den Bossche et al., 2006), in practice they often co-exist and reinforce each other (Geleyn et al., 2010). Therefore, based on the theoretical framework described above and its occurring together, following hypothesis is formulated:

Hypothesis 1 (H1): The amount of (co-)construction and constructive conflict in a team is positively related to the team effectiveness (Boon et al., 2013, p. 363).

### ***The outcomes of team learning.***

#### *Mutually shared cognition.*

Van den Bossche et al. (2006) see mutually shared cognition as the most important outcome of team learning and define it as building a collectively construct from individual opinions. This, in its turn, is commonly shared in the process of collaboration. In this way a joint space (a collaborative learning environment) can emerge (Barron, 2003; Kirschner et al., 2011). Through sharing knowledge and through the processes of (co-)construction and constructive conflict, a team can construct shared beliefs and develop mutual perceptions, which lead to a shared mental model (Arrow, McGrath, & Berdahl, 2000; Decuyper et al., 2010). Shared mental models – or group cognition, joint problem space, etc., as other authors have investigated – enable team members to point their noses in the same direction regarding team goals, roles and work according to the shared and ‘approved-by-all’ assumptions (Akkerman et al., 2007; Marks, Sabella, Burke, & Zaccaro, 2002). Recent studies show that

mutually shared cognition facilitates efficient teamwork, effective decision making and performance (Cannon-Bowers & Salas, 2001; Uitdewilligen, Waller, & Zijlstra, 2010). Moreover, Van den Bossche et al. (2006) discerned a positive significance of team learning behaviour on mutually shared cognition ( $\beta=.67$ ,  $p=.000$ ). Also Boon et al. (2013) found a significance in their multilevel analysis when adding team learning behaviour next to mutually shared cognition ( $\beta=.33$ ,  $p<.01$ ).

Hypothesis 2 (H2): The amount of (co-)construction and constructive conflict in a team is positively related to the mutually shared cognition in this team. (Boon et al., 2013, p. 363)

### *Team effectiveness.*

Van den Bossche et al. (2006) define team effectiveness using three aspects: performance, viability and learning. While performance is seen both as a process and a product of a team's work, viability reflects the willingness of team members to remain a team in the future (Balkundi, Barsness, & Michael, 2009; Boon et al., 2013). Team effectiveness is seen as an outcome variable in the research model for this study. Van den Bossche et al. (2006) see mutually shared cognition besides the most profound learning outcome also as one of the basic parts on which team effectiveness is built. Therefore mutually shared cognition plays an important role in the effectiveness of a team, because it can lead to higher performance (Van den Bossche et al, 2006). Besides the positive results of Van den Bossche et al. (2006), also Boon et al. (2013) found a significance in their multilevel analysis of mutually shared cognition on team effectiveness. Moreover, Boon et al. (2013) reported that mutually shared cognition (partially) mediates the relationship between team learning behaviour and team effectiveness (indirect effect = .17,  $z =6.19$ ,  $p < .0001$ ).

Hypothesis 3a (H3a): Mutually shared cognition is positively correlated to team effectiveness (Boon et al., 2013).

Hypothesis 3b (H3b): The relationship between team learning behaviours and team effectiveness is (partially) mediated by mutually shared cognition (Boon et al., 2013).

### ***Beliefs about the interpersonal context.***

While team leaning behaviour and mutually shared cognition represent the cognitive side of team learning, we now describe the social side of a team: the beliefs regarding the interpersonal context of a team and its influence on building and maintaining shared cognition

(Barron, 2003). We describe the variables psychological safety, cohesion, interdependence, and group potency.

#### *Psychological safety.*

Edmondson's (1999) views are important when we talk about psychological safety. She investigated the relation of team psychological safety on team learning, which means that team members feel safe for interpersonal risk taking in the team (Edmondson, 1999). It is a sense of confidence that when members speak up in the team, they will not be punished, embarrassed or reject by other team members (Edmondson, 1999). In other words, it involves a mutual trust and respect among the members in the team (Edmondson, 1999). When we take a closer look at the social care sector, we see that staff often is confronted with human misery (Geleyn et al., 2010). In such a field, feelings of helplessness, uncertainty, etc. are common. Being able to express these feelings to colleagues is important. Psychological safety brings on confidence concerning expressing themselves and asking questions in the team about work errors. While people who work in a psychologically unsafe team pass over their concerns and errors whereby they avoid important work issues in the daily practice (Ortega et al., 2013). Ramanujam and Rousseau (2006) argue that numerous factors may inhibit an open discussion of errors between team members, whereas psychological safety could create a more open climate. Feeling psychologically safe in sharing emotions, thoughts and feelings is therefore an important aspect in team learning. Edmondson (1999) stresses that psychological safety stimulates team learning behaviour like asking questions, seeking feedback, and so on. In the study by Geleyn et al. (2010) it is found that team psychological safety predicts the basic team learning behaviour the most, which can be read in other studies (Decuyper et al., 2010, Edmondson, 1999, Van den Bossche et al., 2006). Also Boon et al. (2013) reported that psychological safety is a strongly significant predictor for team learning behaviours ( $\beta = .76$ ,  $p < .001$ ).

Hypothesis 4 (H4): Team psychological safety is positively related to team learning behaviour (Boon et al., 2013, p. 362).

#### *Cohesion.*

“*The resultant of all the forces acting on the members to remain in the group*” (p. 274), is how Festinger (1950) defines group cohesion. It can be seen as ‘what holds the group or team together’ (Mullen & Copper, 1994). Van den Bossche et al. (2006) make a distinction

between task and social cohesion, which is derived from Mullen and Copper (1994). Task cohesion is the team members' joint engagement to achieve a collective purpose where group efforts are necessary, while social cohesion is the personal attraction of the team members' to each other in the group (Mullen & Copper, 1994). Mullen and Copper (1994) stress that task cohesion is the main factor in the cohesiveness-performance effect, which means that team members' engagement towards the shared purpose (task) regulates their behaviour on the way to the end. Various authors indicate the importance of social and task cohesion on team learning behaviour, but in the end there are contrasting results (Geleyn et al., 2010; Mullen & Copper, 1994; Van den Bossche et al., 2006). Mullen and Copper (1994), Van den Bossche et al. (2006), as well as Geleyn et al. (2010) found no relationship between social cohesion and team learning behaviour, while for task cohesion Van den Bossche et al. (2006) did see a positive effect ( $\beta = .25$ ,  $p = .013$ ). Although previous research might be inconclusive on the significance of social cohesion for team learning behaviour and team effectiveness, findings prove that the influence of task cohesion on team learning behaviour is stronger than that of social cohesion (Beal, Cohen, Burke, & McLendon, 2003; Boon et al., 2013; Mullen & Copper, 1994). Therefore, following hypotheses are formulated:

Hypothesis 5a (H5a): Social cohesion is not positively related to team learning behaviour (Van den Bossche et al., 2006, p. 501)

Hypothesis 5b (H5b): Task cohesion is positively related to team learning behaviour (Van den Bossche et al., 2006, p. 501)

### *Interdependence.*

Wageman (1995) draws a distinction between task and outcome interdependence. Task interdependence is the amount team members have to rely on each other to accomplish their team task successfully (Burke et al., 2006). Outcome interdependence means that team members' individual outcomes will influence the team goal (De Dreu, 2007). Further, Johnson, Johnson, and Smith (2007) make another distinction that occurs in both task and outcome interdependence: positive, negative or no interdependence. Positive outcome interdependence means that individuals can only reach their goal when the other team members also reach their goal(s) (Johnson et al., 2007). In other words, they need each other. Negative interdependence is that the team members feel that they only can reach their goal when others' fail (Johnson et al., 2007). This provokes competition between the team members. No interdependence means, regardless there is collaboration or not, the goal can

individually be achieved (Johnson et al., 2007). The same positive-negative-neutral distinction goes for task interdependence. Both task and outcome interdependence proved to have their significance on teams (Burke et al., 2006; De Dreu, 2007). This means, regardless the type of interdependence (task or outcome), both interdependencies positively affect how members rely on each other in order to learn and reach their goal (Wageman, 1995). Edmondson (2002) adds that there is a positive relationship between team interdependence and team learning, which is confirmed in the findings of Van den Bossche et al (2006) ( $\beta = .25$ ,  $p = .001$ ). Moreover, there is seen in an exploratory factor analysis that the different construct of interdependence often are clustered. Therefore, we consider interdependence as one construct in this study and hypothesis it as follow:

Hypothesis 6 (H6): Interdependence is positively related to team learning behaviour (Van den Bossche et al., 2006).

#### *Group potency.*

Group potency is a social-psychological factor. It involves a motivational aspect and it is an important factor of group outcomes (Hirschfeld, Jordan, Field, Giles, & Armenakis, 2005; Lee, Farh, & Chen, 2011; Lester, Meglino, & Korsgaard, 2002). Mathieu et al. (2008) and Sargent and Sue-Chan (2011) define group potency as the collective belief in the ability to be successful as a team in various tasks in diverse contexts. In other words: The team's collective belief in the ability to perform in general or in multiple tasks in complex environments (Lee et al., 2011; Sargent, & Sue-Chan, 2011). Lee et al. (2011) also argue that cooperative teams have greater confidence in their capabilities to achieve the common team goals. Those teams work harder to build a mutual team sense of potency to foster the acceptance of their shared identity towards the team goals. Cohen and Bailey (1997) investigate group potency as a predictor for team effectiveness. Edmondson (1999) and Van den Bossche et al. (2006) confirm this significance for team learning behaviour. Boon et al. (2013) found a significantly positive relation between group potency and team learning ( $\beta = .27$ ,  $p < .001$ ). Beside these findings, Le Blanc, Shaufeli, Salanova, Llorens, and Nap (2010) state that efficacy beliefs, group potency included, may be an antecedent of team learning. Following hypothesis is formulated:

Hypothesis 7 (H7): Group potency is positively related to team learning behaviour (Boon et al., 2013, p. 362).



## **Task complexity.**

There has been a lot of research on task complexity in relation to performance (Campbell, 1988; Haerem & Rau, 2007; Mangos & Steele-Johnson, 2001) and evidence that shows that task complexity is a key factor in determining learning efficiency in both individual and collaborative learning environments (Kirschner et al., 2011). Furthermore Giordano and George (2013) mentioned a significant effect of task complexity on group performance. Since complexity of a team task is a prominent feature that can influence collaborative learning and team effectiveness (Nahrgang et al., 2013; Fransen, Kirschner, & Erkens, 2011; Kirschner et al., 2011; Wegge, Roth, Neubach, Schmidt, & Kanfer, 2008), this study will investigate its influence on team learning and team effectiveness in social care teams. However, first a nuance has to be made. Task complexity is not synonymous with difficulty (Campbell, 1988; Kyndt, Dochy, Struyven, & Cascallar, 2011). A task can be difficult without being complex, while other tasks can be difficult because of their complexity or a task can be complex for one person but not for another (Campbell, 1988; Kyndt et al., 2011). It has to be acknowledged that, most of the time, task complexity is examined as an umbrella concept, although a recent review of Liu and Li (2012) shows that different dimensions are underlying the concept of task complexity. This means that task complexity is an integrative, multidimensional task characteristic that is composed of different ‘dimensions’, which means that it covers a variety of concepts (Liu & Li, 2012). We define task complexity as “*the aggregation of any intrinsic task characteristic that influences the performance of a task*” (Liu & Li, 2012, p. 259). Another distinction made in literature is the difference between objective and subjective task complexity (Kyndt et al., 2011; Liu & Li, 2012). Whereas objective task complexity explains why a task is complex, subjective task complexity shows why the task performer feels it is complex (Haerem & Rau, 2007; Liu & Li, 2012; Mangos & Steele-Johnson, 2001). In recent studies, subjective task complexity is pointed out as an important determinant of task performance, whereby the effect of objective task complexity is partially mediated through subjective task complexity (Gupta, Li, & Sharda, 2013). Therefore, we choose to focus on the team members’ perception of certain task complexity dimensions. We focus on four sub dimensions of task complexity as identified by Liu and Li (2012), namely: time pressure, multiplicity in outcomes, instability and reliability. In the section below descriptions will be given of these four dimensions. Also, hypotheses are drawn that we further in this study will examine.

### ***Time pressure.***

Time pressure occurs when the team has less time available or when there is an urgency or risk (Liu & Li, 2012). Transferred to the practice of social care: Such a team has to anticipate on quickly changing situations like an epileptic seizure, an aggression attack, new procedure, etc. According to Cummings, Sasangohar and Thornburg (2010), the contribution of the time factor is underestimated. Liu and Li (2012) stress that time pressure can be manipulated directly and independently external to the task. Research, however, has shown different results. Some researchers found no relationship (Topi, Valacich, & Hoffer, 2005) or a negative relationship between time pressure and performance (McDaniel, 1990; Kobbeltvedt, Brun, & Laberg, 2005; Roskes, Elliot, Nijstad, Carsten, & De Dreu, 2013), while other research nuances the negative relationship. For example, Nordqvist, Hovmark, and Zika-Viktorsson (2004) found a slightly negative effect, but when moderated by team support for the goal and collective ability the negative effect disappeared. This means that social interaction processes can moderate the negative effect of time pressure (Nordqvist et al., 2004), which could mean that team learning behaviour can be a mediator for the relationship between time pressure and team effectiveness. Besides this kind of linear relationships, there are inverted U-shaped relationships in time pressure (Pepinsky, Pepinsky, & Pavlik, 1960). For example, current research by Bear and Oldham (2006) revealed similar results as with Pepinsky et al. (1960), namely an inverted U-shape relationship between creativity and time pressure. Based on the most recent research we set up following hypotheses:

Hypothesis 8a (H8a): Time pressure is negatively related to team learning.

Hypothesis 8b (H8b): Time pressure is negatively related to team effectiveness, but can be mediated by team learning.

Hypothesis 8c (H8c): Time pressure is curvilinear related to team learning.

Hypothesis 8d (H8d): Time pressure is curvilinear related to team effectiveness.

### ***Unreliability.***

Unreliability concerns misleading and inaccurate information about the task (Liu & Li, 2012), which is common in complex systems. As task complexity increases, solution confidence decreases (Carey & Kacmar, 1997). This means that uncertainty or unreliability will increase, but White and Koehler (2007) stress that the most important choices are made under conditions of uncertainty. To determine task complexity Bonner (1994) made a

distinction between the clarity of information and the quantity of information. Task clarity is the degree to which information cues are consistent with each other and with the information stored in a person's memory, which corresponds to our conceptualisation of 'unreliability' (Bonner, 1994; Mascha & Miller, 2010). Bonner (1994) argues that a task that is not specific and holds unclear information requires more knowledge or a higher level of expertise (Schraagen & Lucassen, 2011). Therefore, Bonner (1994) made another distinction between novices and experts, since experts can deal better with unclear inputs because of their prior knowledge about the input elements. Giordano and George (2013) argue that "*complex tasks often lead to situations where individuals have more information than they can assimilate and process in a given timeframe, and this problem is heightened when unclear information is present (as it in lower synchronicity communication settings)*" (p. 3). Based on this citation, we could hypothesise that when teams have to deal with an increase of unclear information, it will negatively affect the team learning behaviour whereas Giordano and George (2013) stress that it lowers the communication setting. Since team learning behaviour influences the team's effectiveness directly, we also could hypothesise that unreliability in information would lead to a lower team effectiveness. We draft therefore following hypotheses:

Hypothesis 9a (H9a): Unreliability is negative related to team learning behaviours.

Hypothesis 9b (H9b): Unreliability is negative related team effectiveness.

### ***Instability.***

Instability is considered as a variability, which means that there are changes or unstable task characteristics (Liu & Li, 2012). We often notice in the social care practice changes in the situation, whereby the necessity for a non-routine response emerges (Canas, Quesada, Antoli, & Fajardo, 2003). For example, a team is working towards sheltered housing for a person with a mental disability, but at a given moment plenty of health problems occur whereby the person needs a lot a health care, so the person is no longer able to live on his/her own. When the team has to deal with this kind of instability, they need to reinterpret the environmental signals, which means that they have to adapt the representation of the task and rethink the set of strategies that are used in order to adjust to the new elements (Canas et al., 2003). Besides, Canas et al. (2003) argue that environmental changes affect people and as a result performance decreases, while these changes only affect experts if they are related to the particular strategies that they develop. A team in de social care sector exists of experts who can jointly handle instability in order to reach their goals. Furthermore, results show that

successful teams encourage their members to be proactive in situations and react on changes in the task and/or working environment in order to continuously move toward the team goals (McComb, Green, & Compton, 2007; Gerwin, 1993; Wageman, 1997), which means this instability could positively influence team learning behaviour and team effectiveness in expert teams. Based on this section, we formulated following hypotheses:

Hypothesis 10a (H10a): Instability is positively related to team learning behaviour.

Hypothesis 10b (H10b): Instability is positively related to team effectiveness.

### ***Multiplicity in outcomes.***

Task complexity increases when the quantity of the desired task output rises (Campbell, 1988; Wood, 1986). According to Campbell (1988) multiple outcomes are one of the four complexity factors that make tasks complex. In a recent study, Kyndt et al. (2011) define a 'complex task' as a task with multiple paths to (a) - and possibly multiple - solution(s). This defined task complexity of Kyndt et al. (2011) can be seen in a broader sense, whereas multiplicity is only one dimension of task complexity (Campbell, 1988; Liu & Li, 2012). For example, Bonner already argued in 1994 about the quantity of information, whereby he hypothesises that the greater the amount of information and the larger the number of steps or procedures, the more complex the task will be considered because of the bigger demands placed on memory. In this context, also Mangos and Steele-Johnson (2009) reported a negative relationship between task complexity - the multiplicity dimension of task complexity - and performance. Dealing multiplicity in outcomes, McComb et al. (2007) discovered that when a team is facing multiple goal paths, higher levels of flexibility diminished the teams' ability to achieve their target and team cohesion, from which we can distract that multiplicity is negatively related to team effectiveness. Besides the results on multiplicity in outcomes and performance in the study of Kyndt et al. (2011) pointed to a relationship between task complexity and learning approaches. We could hypothesis that multiplicity in outcomes could lead to more team learning behaviour because - when team members realise that multiple outcomes are possible - they can discuss and negotiate in order to come to an agreement on which outcome they want to achieve and which path they will follow to reach that team purpose in an effective way.

Hypothesis 11a (H11a): Multiplicity in outcomes is positively related to team learning behaviour.

Hypothesis 11b (H11b): Multiplicity in outcomes are negatively related tot team effectiveness.

### **Method**

To investigate time pressure, unreliability, instability, multiplicity in outcomes and team learning in a social care context in Flanders, an empirical research study was set up, which allows a general investigation across different social care teams.

### **Research Setting and Participants**

To determine teams that can be included for this study and for a diversified data collection, we used the social map of Flanders and the definition of Boon et al. (2013): “A group of people that consists of two or more members (between 18 and 65 years old), which operates around professional activities, with a clear goal or task, can be seen as a team when members and non-members see this group of people as a social entity.” (p. 366). This study involves teams who co-operate for a longer period in function of their clients. They are all operational social care teams in Flanders. Two kinds of contexts were included: teams who work with persons with a (physical and/or mental) disability or teams who work in child/youth welfare. The teams could also work in two different settings: ambulant or residential. In sum, 778 individuals divided over 134 teams completed the questionnaire. When the questionnaire was completed by less than a third of the team members, the team was excluded from the analyses (14 teams). Finally, 120 teams (726 team members) were included in the analyses. The average number of members per team is 6.70 (SD = 2.30 minimum = 3; maximum = 13). 76 of the teams work with disabled persons, while 35 of the teams work in the child or youth welfare domain. From nine teams we did not receive data on this question. Of the participating teams, 60 teams work in an ambulant setting and 60 operate in a residential system. Of the 726 members in the social care sector, 190 members are male and 533 female, while three persons did not filled in this question. Finally, 67.7% of the team members have an ISCED 6 (bachelor) education, next 19.6% is in the possession of a secondary general education, 11.8% has an ISCED 7 (master), and lastly 0.9% achieved secondary vocational education.

### **Instruments**

In line with the initial purpose of replicating the TLB&B model, the TLB&B questionnaire developed by Van den Bossche et al. (2006) was used. This is a validated

questionnaire which measures the constructs of the beliefs of the interpersonal context: group potency (seven items), interdependency (four items), psychological safety (seven items), social cohesion (two items), task cohesion (two items). But it also included the constructs team learning behaviour (nine items), mutually shared cognition (six items) and team effectiveness (five items). To measure four dimensions of task complexity extra items were composed of previous research: time pressure (two items) (Kyndt et al., 2011), instability (five items) (McComb et al., 2007), unreliability (seven items) (McComb et al., 2007; Söderlund & Stein, 2000) and multiplicity in outcomes (three items) (Kyndt et al., 2011) (see Appendix 1). All items in TLB&B as well in task complexity were scored on a seven-point Likert scale that had a range from “strongly disagree” (1) over “neutral” (4), to “strongly agree” (7). Along these items, fourteen questions about demographic information of the participants, like age, gender, education, etc. were added to get a balanced picture of the teams.

## **Analyses**

The majority of the analyses were conducted with the R software (R Development Core Team, 2012; Field, Miles, & Field, 2013), using the packages “psych” (Revelle, 2014), “lavaan” (Rosseel, 2012), “car” (Fox & Weisberg, 2011), “nlme” (Pinheiro, Bates, DebRoy, Sarkar, EISPACK, & the R Development Core Team, 2014), “reshape” (Wickham, 2014), and Hmisc” (Harrell, 2014). For the exploratory factor analysis SPSS is used (Field, 2013; Stern, 2011).

### **Confirmatory factor analysis.**

For the validated TLB&B questionnaire, three confirmatory factor analyses (CFA) were used to test whether the items included in the questionnaire fitted the data. The first CFA analysed the congruency of the five scales measuring the beliefs of the interpersonal context. Then a second CFA tested the adequacy of the fit of the scales measuring team learning behaviour (TLB) and mutually shared cognition (MSC). Finally, a third CFA measured the fit of the team effectiveness (TE) scale. In the first CFA four covariates were added to enhance the model fit. In the second and the third CFA no covariates were added, because there was already a good fit. CFI values after adding four covariates in CFA1 are .91, .94 and .99 and the TLI values are .89, .93 and .96. All the results, except the TLI value of CFA1, reflect an adequate fit of the model to the data, because the values are above .90 (Schumacker & Lomax, 1996). Even when adding more covariates in CFA1, the TLI value stays the same.

Because this value is close to .90 and the CFI shows a good fit, it will be further analysed in the CFA. Furthermore, the SRMR and the RMSEA of the three CFAs have a value smaller than .09 (SRMR = .050, .048 and .026; RMSEA = .059, .062 and .064), which means that these results indicate that the model is acceptable and fits, because RMSEA is between .05 and .08 and the SRMR is below .09 (Browne & Cudeck, 1993). Taking all these statistics into account, 37 of the 40 original items loaded significantly on the construct they were predicted to load on. One item of group potency was deleted since it loaded not significantly. Further also one item of TLB and one item of TE were deleted for this reason. Interdependence, social cohesion and task cohesion have an internal consistency below .65 and are therefore excluded from further analyses (Cohen, 1988).

### **Exploratory factor analysis.**

To validate the seventeen newly developed items of the four dimensions of task complexity, a four exploratory factor analysis (maximum likelihood estimation and Varimax rotation) was conducted (see Appendix 2). However, this factor analysis did not show a clear factor structure. After a first run the constructs time pressure, instability, unreliability and multiplicity in outcomes could not be detected. The items on time pressure loaded not significantly. After controlling for internal consistency it was decided to exclude time pressure ( $\alpha = .20$ ) (Cohen, 1988). After deleting one item due to a non-significant loading, the internal consistency of multiplicity in outcomes was still low ( $\alpha = .55$ ). Therefore we excluded this construct for the further analyses (Cohen, 1988). In the construct unreliability two items are deleted and can be furthered analysed. Finally, we deleted one item in the construct of instability because of the non-significant loading and moreover when deleted this item the internal consistency raised to an alpha of .77 (Cohen, 1988). In sum, task complexity will be analysed by the construct unreliability with 5 items and instability with four items. The results of the final factor analysis with the two remaining factors (instability and unreliability) are listed in Table 1.

### **Within-group agreement as second-level predictor.**

As mentioned earlier, different individuals from several teams across Flanders filled out the questionnaire to gather data. All these team members are nested in teams. As a result, an analysis of the within-group agreement per team and per scale is needed. Hence the multiple-item estimator Rwg (James, Demaree, & Wolf, 1984) is used. First an average Rwg

Table 1: *Output Final Exploratory Factor Analysis (Rotated Factor Matrix)*

Item	Item description	F1	F2
x24	While performing our job we often encounter unpredictable aspects.	.81	
x33	Often unexpected elements or problems occur in the course of the execution of the task.	.82	
x41	Once we start the job, we get nothing unexpected on our way.	-.47	
x47	While working on our task everything is predictable, there are never unexpected events.	-.53	
x23	The task we have to complete with this team is clear and bright.		-.69
x32	The final goal of our work is not entirely clear, and is open to interpretation.		.52
x40	We are as a team uncertain about the best approach and plan for our job.		.52
x46	The instructions that were given to us regarding our task are clear.		-.62
x55	The information that we need to get started is not always accurate and reliable.		.45

*Note.* Factor loadings below -.40 and .40 are not displayed.



score per team was calculated for all constructs individually. Next a within-group agreement of a team was accomplished by calculating the mean Rwg over the different team constructs per team. In the analyses these scores are included to answer the research questions. This mean Rwg of a team represents the within-group agreement (George & Bettenhausen, 1990).

### **Method of analysis.**

The hypotheses will be tested in four parts. First, the relation between the beliefs about the interpersonal context and team learning behaviours will be examined by means of a multilevel analysis. Then instability and unreliability are added together to measure task complexity. In a second step the relation between team learning behaviours, mutually shared cognition and team effectiveness will be investigated. In the third section, the mediation of mutually shared cognition on the relation between team learning behaviours and team effectiveness is tested by means of Sobel's test. Finally, ANOVA-analyses were set up to test the research question "Do the measures of the observed constructs differ significantly between teams who work with persons with a disability and teams who work in child- or youth welfare?" The same research question will be investigated for difference in the field of operation: ambulant versus residential.

## **Results**

The descriptive statistics, correlations and internal consistencies of the investigated factors are listed in Table 2.

First, a multilevel model was built in several steps to predict team learning behaviour (TLB). The relation between beliefs about the interpersonal context and task complexity with TLB was investigated. Following hypotheses were tested: H4, H7, H9a, H10a. Model 1 is calculated without predictors and also included a fixed intercept. Then, Model 1 was compared to Model 2 by using the  $\chi^2$  likelihood ratio test. Notice that Model 2 still had no predictors and subsequently can be called an empty model, but in contrast to Model 1 it includes a random instead of a fixed intercept. The comparison between these two models showed a better fit in Model 2 ( $\chi^2=119.95^{***}$ ), which indicates that a multilevel approach could be beneficial in this study. After this comparison, predictors were added one (or two) at a time to Model 2. The first predictor we added to Model 3 was psychological safety, because in earlier research psychological safety was a strong predictor for team learning behaviour

Table 2  
*Descriptive Statistics, Correlations Among Variables and Cronbach's  $\alpha$*

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Interdependence	5.25	.95	.51												
2. Social cohesion	5.35	.94	.33**	.33											
3. Task cohesion	5.18	1.27	.26**	.56**	.50										
4. Psychological safety	5.25	.74	.57**	.46**	.46**	.77									
5. Group potency	5.20	.70	.50**	.45**	.43**	.55**	.73								
6. Time pressure	3.55	.98	-.032*	-.16**	-.23**	-.19**	-.14**	.20							
7. Unreliability	4.86	.86	.38**	.50**	.61**	.45**	.55**	-.12**	.67						
8. Instability	5.31	1.03	-.086*	.17**	.24**	.12*	.13**	-.19**	.004	.76					
9. Multiplicity in outcomes	4.80	.73	.20**	.0013	-.0034	.23**	.25**	.065**	-.002	.11*	.38				
10. Team learning behaviour	5.36	.62	.61**	.49**	.50**	.68**	.64**	-.11**	.54**	.17**	.15**	.85			
11. Mutually shared cognition	4.91	.90	.71**	.36**	.26**	.55**	.52**	-.18	.39**	-.009*	.16**	.62**	.80		
12. Team effectiveness	5.80	.73	.52**	.52**	.56**	.66**	.60**	-.20**	.49**	.23**	.16**	.71**	.49**	.65	
13. Within-group agreement	.90	.05	.17**	.16	.16**	.22**	.13**	-.13**	.12**	-.0002	.003*	.20**	.20**	.18**	.70

*Note.* \* $p < .05$ , \*\* $p < .01$

(Geleyn et al., 2010). After adding psychological safety, Model 3 showed a better fit than Model 2 ( $\chi^2=364.77^{***}$ ). Next, group potency was added (Model 4). The results also showed a better fit after comparing Model 3 to Model 4 ( $\chi^2=148.32^{***}$ ). After adding the variables of the interpersonal context, the variables measuring task complexity were added in Model 5. This involves the variables instability and unreliability which are added together because Liu and Li (2012) suggested that these variables are sub dimensions of task complexity. Both instability and unreliability are significant to TLB. By adding these two variables the model fit increased significantly ( $\chi^2= 37.28^{***}$ ). In a last model the within-agreement per team (mean Rwg) was added as a level 2 predictor (Model 6). This study found no significant difference between in the model fit of Model 6 and 7. Therefore, Model 6 is considered as our final model. The results of the different multilevel models are listed in Table 3.

Because social cohesion, task cohesion, interdependence, time pressure and multiplicity in outcomes were not included in the multilevel analysis (see Method), we cannot discuss hypotheses H5a-b, H6, H8a-d, and H11a-b, since they were deleted in the confirmatory factor analysis. H4 concerning the (positive) relation between psychological safety and team learning ( $b=.32, t=12.48, df=600, p < .001$ ) was confirmed by the multilevel analyses. Also for group potency ( $b = .27, t = 9.95, df = 600, p < .001$ ), and instability ( $b = .030, t = 2.21, df = 600, p = .028 (p < .01)$ ) we see similar results, which means that also hypotheses H7 and H10a can be confirmed, with the nuance that instability has rather a small effect. For unreliability we hypothesised a negative effect, but found a small positive one ( $b=.090, t = 3.82, df = 600, p < .001$ ). This means H9a is not confirmed and even more there is an opposite effect. Finally, the pseudo- $R^2$  of this final model equals 0.69. Second, multilevel analyses were built up to investigate the mediation of mutually shared cognition (MSC) on the relation between TLB and team effectiveness (TE) and the effect of the dimensions of task complexity on TLB and TE, which measured following hypotheses: H1, H2, H3a, H3b, H9b, and H10b. The results of this second multilevel analysis are in Table 4. Similar to the first multilevel analyses Model 1 was an empty model (without predictors) with a fixed intercept and Model 2 was an empty model with a random intercept. The model fit comparison between Model 1 and Model 2 indicates that multilevel analyses are feasible ( $\chi^2= 122.27^{***}$ ). As the previous multilevel analysis, predictors were added. We first added the predictor MSC to Model 3. This Model 3 showed a better fit then Model ( $\chi^2= 166.50^{***}$ ). In Model 4 the predictor TLB was added ( $\chi^2= 254.60^{***}$ ). Next and similar to the first part of the multilevel

Table 3  
*Results multilevel analysis (team learning behaviours as dependent variable)*

	Model					
	1	2	3	4	5	6
<i>Fixed effects: t-statistics (df)</i>						
(Intercept)	232.91*** (725)	144.97*** (605)	19.65*** (604)	11.91*** (603)	8.73*** (601)	2.40* (601)
Psychological safety			22.41***	15.22*** (603)	13.59*** (601)	13.26*** (601)
Group potency				12.84*** (603)	9.97*** (601)	9.95*** (601)
Instability					2.86** (601)	2.91** (601)
Unreliability					5.68*** (601)	5.67*** (601)
Within-group agreement (level 2 predictor)						1.47 (118)
<i>Random effects: variance components</i>						
(Intercept)		.12	.032	.020	.020	.017
Residual		.26	.18	.14	.14	.14
<i>Model comparison</i>						
2 log likelihood	1361.66	1241.71	876.94	728.63	691.37	689.20
Models Compared		1 versus 2	2 versus 3	3 versus 4	4 versus 5	5 versus 6
$\chi^2$		119.95***	364.77***	148.32***	37.28***	2,17
(df)		(2,3)	(3,4)	(4,5)	(5,7)	(7,8)
<b>Notes:</b> n(observations) = 726; n(groups) = 120. Model 1: fixed intercept; Model 2: random intercept; Model 3: psychological safety; Model 4: adding group potency; Model 5: adding task cohesion; Model 6: adding instability and unreliability; Model 7: adding within-group agreement (level 2); Model 8: adding cross-level interaction effect psychological safety*within-group agreement. * $p < 0.05$ , ** $p < 0.01$ , *** $p < 0.001$						

Table 4  
*Results of Multilevel Analysis (Team Effectiveness as Dependent Variable)*

	Model					
	1	2	3	4	5	6
<i>Fixed effects: t-statistics (df)</i>						
(Intercept)	215.26*** (725)	134.97*** (605)	28.68*** (604)	9.07*** (603)	5.47*** (601)	1.03*** (601)
Mutually shared cognition			13.71*** (604)	2.98 *** (603)	3.31 *** (601)	3.14*** (601)
Team learning behaviours				17.76*** (603)	14.13 *** (601)	14.02*** (601)
Instability					5.02*** (601)	5.05*** (601)
Unreliability					4.25*** (601)	4.24 *** (601)
Within-group agreement (level 2 predictor)						1.53*** (601)
<i>Random effects: variance components</i>						
(Intercept)		.15	.10	.040	.026	.026
Residual		.36	.29	.22	.21	.21
<i>Model comparison</i>						
2 log likelihood	1591.93	1469.66	1303.16	1048.56	1010.32	1007.97
Models Compared		1 versus 2	2 versus 3	3 versus 4	4 versus 5	5 versus 6
$\chi^2$		122.27***	166.50***	254.60***	38.24***	2.34
(df)		(2,3)	(3,4)	(4,5)	(5,7)	(7,8)
<i>Note.</i> n(observations) = 726, n(groups) = 120. Model 1: fixed intercept; Model 2: random intercept; Model 3: MSC; Model 4: adding TLB; Model 5: adding instability and unreliability; Model 6: additions level 2 predictor. * $p < 0.05$ ; ** $p < 0.01$ ; *** $p < 0.001$						

analysis instability and unreliability are added together ( $\chi^2= 38.24^{***}$ ). At last, a Model 6 was created to examine the within-agreement per team (mean Rwg) on top of the other predictors. The results show in this study no significant difference in the model fit between Model 5 and 6 ( $\chi^2= 2.34$ ). For that reason, was Model 6 considered as our final model.

The results of our final model (Model 6) show that MSC ( $b=.092$ ,  $t=3.31$ ,  $df=601$   $p=.001$ ), TLB ( $b=.61$ ,  $t=14.13$ ,  $df =601$   $p<.001$ ), unreliability ( $b=.11$ ,  $t=4.25$ ,  $df=601$ ,  $p<.001$ ) and instability ( $b=.096$ ,  $t=5.02$ ,  $df= 601$ ,  $p<.001$ ) significantly predict TE. Examining these results show that H1, H3a, and H10b can be confirmed, which means that these variables are positive related to TE. H9b was not confirmed, because we expected a negative effect on TE, but found a positive one.

To investigate H3b, the mediating effect of MSC in the relationship between TLB and TE, a Sobel's test was set up. This tested the indirect significance or in other words examine whether or not mediation takes place. The mediated effect of MSC between TLB and TE is ( $b=.71$ ,  $t=17.74$ ,  $df=603$ ,  $p<.001$ ). This means that mediation takes places. But the contribution of TLB remains strong ( $b=.84$ ,  $t=19.32$ ,  $df=604$ ,  $p<.001$ ), meaning H2 is confirmed and the mediation effect (H3b) is limited. Finally, the pseudo- $R^2$  of this final model (Model 6) is .65.

In a last phase of the analyses we did ANOVA's to test the differences among the kind of teams. First, a distinction was made between the context of a team, to examine difference between teams that work in an ambulant or in a residential context. The results show that there are significant differences regarding group potency ( $F(1)$ ,  $F=6.17$ ,  $p<.05$ ,  $\eta^2=.0076$ ), instability ( $F(1)$ ,  $F=4.28$ ,  $p<.05$ ,  $\eta^2=.01$ ) and TLB ( $F(1)$ ,  $F=10.90$ ,  $p<.01$ ,  $\eta^2=.019$ ). However, the effect size of group potency is negligible, but the mean of teams that work in an ambulant setting is higher, which means there is more difference in this group. Also for instability and TLB the effect sizes are rather small. For instability we see a mean of 5.66 for ambulant teams, while 5.38 for residential teams, whereas there is again more difference in ambulant teams. For TLB however we see the opposite: The mean is higher for residential teams. Secondly, a distinction in the field of operation teams work in was made: working with disabled persons or working in the child or youth welfare sector. The ANOVA showed that there are significant differences for instability ( $F(1)$ ,  $F=47.09$ ,  $p<.001$ ,  $\eta^2=.083$ ) unreliability ( $F(1)$ ,  $F=21.88$ ,  $p<.001$ ,  $\eta^2=.023$ ) and MSC ( $F(1)$ ,  $F=11.63$ ,  $p<.001$ ,  $\eta^2=.013$ ). For MSC a small effect was found, while for unreliability the effect size is medium and the biggest effect

size was found on instability. When looking towards the direction of the effect by comparing means, we notice that unreliability and MSC have a higher mean for teams working with disabled persons, while for instability an opposite direction was found. Namely a higher mean for teams working in child or youth welfare. This means there is more difference in instability for teams in the child or youth welfare.

### **Conclusion and Discussion**

The purpose of this article was to replicate the Team Learning Beliefs & Behaviours (TLB&B) model of Van den Bossche et al. (2006), by transferring it from the original educational context to social care teams in Flanders, whereby instability and unreliability were added as two dimensions of task complexity. In contrast to earlier research by Boon et al. (2013) and Veestraeten et al. (2014), this study was not carried out for high risk teams like police and firemen or military teams, but it did kept the more precarious and dynamic context of these kind of teams. Our findings show that the TLB&B model can indeed be confirmed in the social care practice, and that the addition of unreliability and instability are valuable in this context. It confirms team learning is beneficial for social care teams, because, as mentioned by Bartolo et al. (2001), Leichtman (2008) and McKenzie (2011), these teams have to deal with specific cases are often confronted with changes and uncertainty, and moreover, have to come to a comprehensive understanding to set up an appropriate intervention (Edmondson, 1999; Kirschner et al., 2011; Liu & Li, 2012; Van den Bossche et al., 2006). Taking earlier research into account, the TLB&B model indicates that it can be used to examine team learning in various contexts. This study also shows that it can be applied in a social care setting. However, some outcomes differed due to the particular context of this study and due to the addition of two dimensions measuring task complexity: instability and unreliability.

First, in the multilevel analysis with team learning behaviour as dependent variable the results show that feeling psychologically safe influences team learning behaviour in a positive way. Thus, it is assumed that psychological safe teams benefit when it comes to team learning behaviour. This also applies to group potency. Namely, if a team's collective belief in the ability to be successful in various tasks is high, this will have a positive influence on the occurrence of team learning behaviour. All these results correspond with earlier research (Boon et al., 2013; Geleyn et al., 2010; Van den Bossche et al., 2006; Veestraeten et al., 2014). When looking at instability, a small positive effect on team learning behaviour is

found. This means that instability in the task, like changes in task characteristics, stimulates the occurrence of team learning behaviour and such a positive effect of instability is also found in the second multilevel analysis with team effectiveness as dependent variable. These results of instability are in line with earlier research, namely that successful teams encourage each other on changes in the task and/or working environment in order to act effectively as a team (McComb et al., 2007; Gerwin, 1993; Wageman, 1997). Also, for unreliability there is a slight positive effect found on team learning behaviour and team effectiveness, while it was negatively hypothesised. These results mean that when unreliability occurs in the team task, team learning behaviour and team effectiveness arise. These effects could be explained by the fact that team members have to communicate more when information is unreliable in order to achieve team purposes. Even more, based on these results, when dealing with unreliable information in the task, team learning behaviours occur. Unreliability can thus be seen as an important dimension which makes the task in social care teams on the one hand complex, but at the same time, this variable - which was expected to be impede team learning behaviour and team effectiveness in this domain - triggers the occurrence of team learning behaviour in order to cope this unreliability and in turn it fosters the team to set up the most effective intervention for their clients. Possibly, there may also be a mediation effect of team learning behaviour on unreliability and team effectiveness, but unfortunately this has not been investigated in this study. Possibly, the same mediation effect could apply to instability. In sum, a general explanation for the positive relationship between unreliability and instability on team learning behaviour and team effectiveness could be found in the 'motivation to reduce uncertainty'-model (Kramer, 1999). This model states that people who have to act in an instable or unreliable situation, search for more or new information to handle the situation and in order to be more effective. In other words, dealing with instability and unreliability stimulates team learning behaviour in a positive way, and in turn has a positive influence on team effectiveness.

Further, the remaining results in the second multilevel analysis on team effectiveness show that mutually shared cognition influences team effectiveness positively, so teams that build a mutually shared cognition, will raise their effectiveness. This mutually shared cognition is built through team learning processes. Mutually shared cognition can thus be seen as a mediator of the relationship between team learning behaviour and team effectiveness. This study shows it significant, as in a previous study by Boon et al. (2013). A nuance however: This mediation is a partial effect, because team learning behaviour also has a direct



positive influence on team effectiveness. We can conclude that working in a collaborative learning environment is beneficial for social care teams to build and maintain a mutually shared cognition in order to enhance team effectiveness. A consequence for operational social care teams: Through team learning behaviour - sharing, finding and discussing (new) information - a team can construct shared beliefs and develop mutually shared perceptions, which enable team members to go for team goals, roles and work (Akkerman et al., 2007; Arrow et al., 2000; Decuyper et al., 2010; Marks et al., 2002).

Thirdly, in both multilevel analyses the within-group agreement as a variable was added in order to recognise that individual team members are nested in teams. In both analyses, the results show that the degree to which team members share beliefs has no influence on the emergence of team learning behaviour and team effectiveness. It is remarkable that these results were obtained in previous research. A possible explanation for these contradicting results could be that there is little intra-group variance contrary to the other studies, which means there is more consensus within the teams, so it is difficult to find differences. These minor differences between teams are reflected by the high mean Rwg score (George & Bettenhausen, 1990).

Finally, we expected differences depending on the field of operation and the context. When looking at the results, the most effect sizes in these ANOVA's show rather small effects. This could indicate that social care teams, regardless the field of operation or context, cope with instability, unreliability and the TLB&B model in the same way. However, a medium effect size is found for the constructs unreliability and instability, dependent on the field of operation. There are differences in both constructs depending on whether a team works with disabled persons or teams that work in child or youth welfare. A possible explanation for these differences could be in the nature of the target group (disabled person vs. children/youth), whereby specific and different approaches are required (Bartolo et al., 2001; Leichtman, 2008; McKenzie, 2011).

In general, we could conclude that these results are beneficial for further research, which we will describe in the following section. But first, it is also helpful for the practice. The results indicate that psychological safety and group potency are important variables to predict team learning behaviour and team effectiveness, while team learning behaviour could be useful to cope with the unreliability and instability in order to be more effective as a team. Therefore, for the practice it may be useful to pay attention to the psychological safety and group potency of social care teams, because this forms the foundation for the occurrence of

team learning behaviour and in turn helps teams to deal effectively with unreliable and instable information in the team task.

### **Limitations and Suggestions for Further Research**

First, due to the results of the factor analyses, several constructs were deleted. The deletion of the constructs that consist of merely two items was not unexpected. When one of two questions was formulated inversely made it confusing for the respondents to answer them. Subsequently, the construct task cohesion had to be deleted. Unfortunately, also social cohesion, interdependence, time pressure and multiplicity outcomes had to be deleted, which limited the research. Therefore expanding and revising the questionnaire would be valuable in order to measure all these constructs, since this was considered important in the theoretical background.

Beside the limitations of the questionnaire, restrictions about the research method have to be mentioned. Firstly, we can only measure what we asked through the questionnaire, which limits the research. Other issues, that we are unaware of, might be important. As a consequence, a qualitative study finding underlying constructs that we now not know about may be interesting. Secondly, the questionnaire was filled out at a specific moment in time, so there is a time display. A longitudinal study would be valuable to see the development of the teams on team learning and the coping with instability and unreliability over a longer period of time. Thirdly, this study made a distinction between context and field of operation. Due to a limited number of teams (120) and the limited and unbalanced response to the questionnaire itself, this study merely investigated differences in an exploratory way. As a consequence, research could investigate on a larger scale which differences can be recognised and how these, dependent on the field of operation and/or context, differ. This can be accomplished through investigating interaction effects in a more detailed way, for example. Besides, it would be valuable to investigate the context of disabled persons and the child/youth welfare in a more in-depth way: What are specific elements or characteristics in these contexts and moreover, which are similarities and differences in the different task complexity dimensions (unreliability and instability) and do these dimensions have specific elements dependent on the context? Besides, how do these dimensions (and its elements) influence team learning behaviours, mutually shared cognition and in turn the effectiveness of the team?

Furthermore, extra analyses of data between the dimensions instability and unreliability and the beliefs about the interpersonal context would be valuable in further

research to investigate more in depth. For example, which are the specific elements that make a team task in the social care domain unreliable and unstable (Liu & Li, 2012)? And as mentioned above, are there different elements for instability and unreliability across the context and field of operation in social care teams? How do these dimensions relate to each other and to the interpersonal beliefs? And, how do the specific elements of the different dimensions influence team learning behaviour, mutually shared cognition and team effectiveness? Therefore, the Job Demand-Control model (JDR-model) – developed in 1979 by Karasek – could be helpful. This model is the foundation for the recent Job Demands-Resource models (Bakker, van Emmerik, & Euwema, 2006; Bakker, Demerouti, Verbeke, 2004; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Van de Ven & Vlerick, 2011). All these studies imply that employees (or teams), experience job demands (for example complex tasks that are unreliable and unstable) and have certain job resources to deal with these demands. Subsequently, these job demands might have a negative impact on the well-being of the employees, or in other words, on the outcomes. But, we have to nuance these beliefs. When enough job resources are available, they can counter the negative effect of the demands on the outcomes. Moreover, they may turn a stressful situation into a stimulating one. In sum, job resources influence job demands in a way that the demands can lead to on the one hand pressure or stress situations and on the other, positive outcomes or employee well-being (Demerouti et al., 2001; Karasek, 1979; Van de Ven, & Vlerick, 2011). Based on earlier research and given the context of this study, we can expect that the potential activity level of teams increases due to a wider range of solutions to deal with challenging job demands, for example the complexity of a team task (instability and unreliability) (Karasek, 1979; Van de Ven, 2011). Therefore, investigating the data of this study in a job demands and resource model would be valuable (see Figure 2).

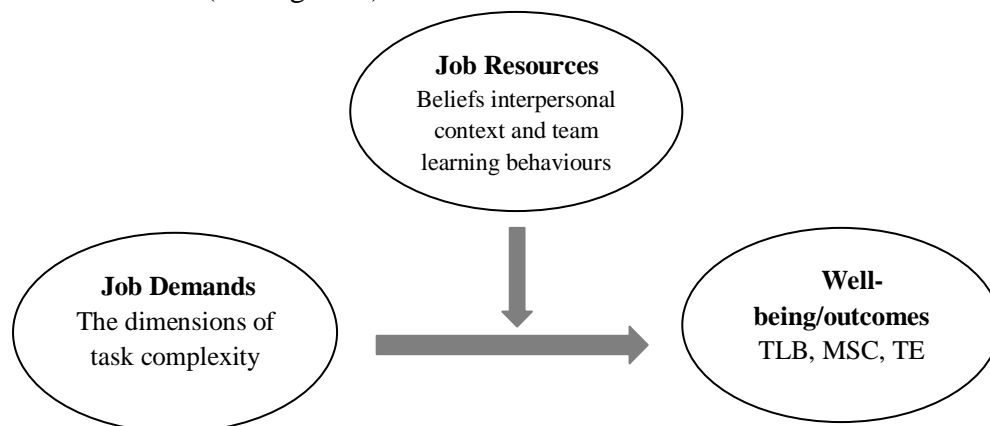


Figure 2. Hypothesised Job Demands-Resource model

The four task complexity dimensions (and its characteristics) described in the theoretical background of this study can be seen as ‘job demands’, the four beliefs and the three behaviours as ‘job resources’. These job resources are then the coping mechanisms to deal with the job demands. Subsequently, the mediating relationship of the job resources between job demands and well-being/outcomes might be investigated more in detail according to this model. So far, only the influence of the interpersonal context and instability and unreliability are measured separately on team learning behaviour and team effectiveness. Because it is assumed that this direct and mediated relationship can influence the outcomes, it is advisable - after investigating specific elements of the dimensions instability and unreliability - to measure the mutual relationship of job resources and job demands and also the direct and indirect influence on team learning behaviour, mutually shared cognition and team effectiveness. Even more and as mentioned earlier in the section above, it could be interesting to investigate these relations also according to the ‘motivation to reduce uncertainty’-model developed by Kramer (1999).

Finally, a next step of this research would be to investigate instability, unreliability and other dimensions of task complexity in different contexts with different team types. The same applies for the TLB&B model. The first reason is that there has to be done a lot of research into the different dimensions of task complexity, because this is often investigated superficial and as an umbrella concept, which is disproved by Liu and Li (2012) and is confirmed by this study. A second reason is that the value of replica studies is often underestimated, but their value for well-informed practices, however, are priceless.

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## Appendix 1

Constructs TLB&B	Items
Team effectiveness	<p>I am satisfied with the performance(s) of our team.</p> <p>We have accomplished this task in a way that we all agree.</p> <p>I would like to work with this team in the future.</p> <p>We have learned a lot as a team.</p>
Mutually shared cognition	<p>At this moment, the team has a shared understanding of its task.</p> <p>At this moment, the team has a shared understanding of how it intends to approach its task.</p> <p>At this moment, the team members have similar opinions about the occurred problems.</p> <p>As a team, we think the same about the way our problems can be solved.</p> <p>At this moment, the team has a common understanding of the objectives to be achieved.</p>
Team learning behaviour	<p>In this team, I share all relevant information and ideas with other members of the team.</p> <p>The team members listen carefully to each other.</p> <p>If there is anything unclear, we ask each other questions.</p> <p>The team members build on the ideas and information from other team members.</p> <p>Information from team members is supplemented by information from other team members.</p> <p>The team members draw conclusions from the ideas discussed in the team.</p> <p>This team is trying to cope with different ideas to deal with them directly.</p> <p>This team will take into account the comments that are given on ideas.</p> <p>Team members questioning each other's opinions and ideas.</p>
Interdependence	<p>My team members are dependent on me for information and advice.</p>

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	I am depended on my team for information and advice.
	The team members agree on what we want to achieve.
	When my team members succeed in their work, this has a positive effect on me.
Social cohesion	I'll agree with the other members of my team.
	I am friends with the members of my team
Task cohesion	I am dissatisfied with the level of involvement of the team on the job task.
	This team gives me insufficient ability to improve my personal performance(s).
Group potency	This is a confident team.
	This team believes that no task is too difficult for them.
	This team expects to have a strong performing reputation as a group.
	This team believes it can become exceptionally well and can successfully handle any task.
	This team believes it can be very effective.
	This team can get a lot done when it works hard.
Psychological safety	If you make a mistake in this team, it is often used against you.
	The team members are able to discuss problems and difficult issues.
	It is safe to take risks in this team.
	No one in this team would do something that my efforts wipe out.
	My unique abilities and talents are valued and utilised in this team.
	Sometimes people in this team reject other team members because they are different.
	It is difficult in this team to ask for help.

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<b>Constructs task complexity</b>	Items
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Time pressure	<p>We (as a team) have too little time to perform this task.</p> <p>We (as a team) have enough time to perform this task.</p>
Multiplicity in outcomes	<p>There are several possible ways to reach a solution for our task.</p> <p>We can solve the task in other ways than the ways we use now.</p> <p>There are several appropriate solutions for our task.</p>
Unreliability	<p>There remains some uncertainty about the solution of our team task.</p> <p>The task we have to complete with this team is clear and bright.</p> <p>The final goal of our work is not entirely clear, and is open to interpretation.</p> <p>We are as a team uncertain about the best approach and plan for our job.</p> <p>The instructions that were given to us regarding our task is clear.</p> <p>It is easily to predict the problems we encounter during our work.</p> <p>The information that we need to get started is not always accurate and reliable.</p>
Instability	<p>The purpose of our task changes throughout its implementation.</p> <p>While performing our job we often encounter unpredictable aspects.</p> <p>Often unexpected elements or problems occur in the course of the execution of the task.</p> <p>Once we start the job, we get nothing unexpected on our way.</p> <p>While working on our task everything is predictable, there are never unexpected events.</p>

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## Appendix 2

Items	Item description	F1	F2	F3	F4
X12	The purpose of our task changes throughout its implementation.				.86
X24	While performing our job we often encounter unpredictable aspects.		.71	-.26	
X33	Often unexpected elements or problems occur in the course of the execution of the task.		.78		
X41	Once we start the job, we get nothing unexpected on our way.		-.29	.61	
X47	While working on our task everything is predictable, there are never unexpected events.	.32	-.27	.72	
X11	There remains some uncertainty about the solution of our team task.	-.63			
X23	The task we have to complete with this team is clear and bright.	-.32		.38	
X32	The final goal of our work is not entirely clear, and is open to interpretation.	.38			
X40	We are as a team uncertain about the best approach and plan for our job.	.67			
X46	The instructions that were given to us regarding our task is clear.	-.73			
X52	It is easily to predict the problems we encounter during our work.		-.27		
X55	The information that we need to get started is not always accurate and reliable.	.45			
X9	We (as a team) have too little time to perform this task.	.28			
X21	We (as a team) have enough time to perform this task.			.26	-.69
X10	There are several appropriate solutions for our task.			.33	
X22	We can solve the task in other ways than the ways we use now.		.28		
X31	There are several possible ways to reach a solution for our task.		.42		

*Appendix 2: Output four factor analysis (rotated factor matrix)*